Illinois NEPA/404 Merger Meeting
Illiana Corridor – Tier 2 Environmental Impact Statement
April 16, 2013

Federal Highway Administration Conference Room 3250 Executive Park Drive Springfield, IL 62703	**Federal Highway Administration 575 N. Pennsylvania, Rm 254 Indianapolis, Indiana**	**U.S. Environmental Protection Agency Ralph Metcalfe Federal Building 16th Floor Conference Room 77 West Jackson Blvd. Chicago, IL 60604**

9 am – 10 am

- Scoping Document - Comments
- Concurrence – Purpose and Need

10 am – 11:30 am

- Project Update
    - I-Bat survey locations
    - Stakeholder outreach
    - Section 106 coordination status
    - Field visit for agencies
    - Next monthly meeting

11:30 am to 1 pm

- Lunch Break

1 pm to 3 pm

- Grassland bird methodology

NEPA-404 Merger Meeting
April 16, 2013
Chicago, IL
(List re-created by Matt Fuller, original sign-in sheet is missing)

Matt Fuller, FHWA
Meghan Jones, FHWA
Norm West, USEPA
Shawn Cirton, USFWS
Soren Hall, USACE
Steve Schilke, IDOT
Katie Kukielka, IDOT
Vanessa Ruiz, IDOT
Ed Leonard, PB
Steve Ott, PB
Ron Schmizu, PB
Renee Thakali, USFS
Bob Hommes, USFS
Wade Spang, USFS
Bill Glass, USFS
Jim Novak, Huff & Huff
Evan Markowitz, Huff & Huff

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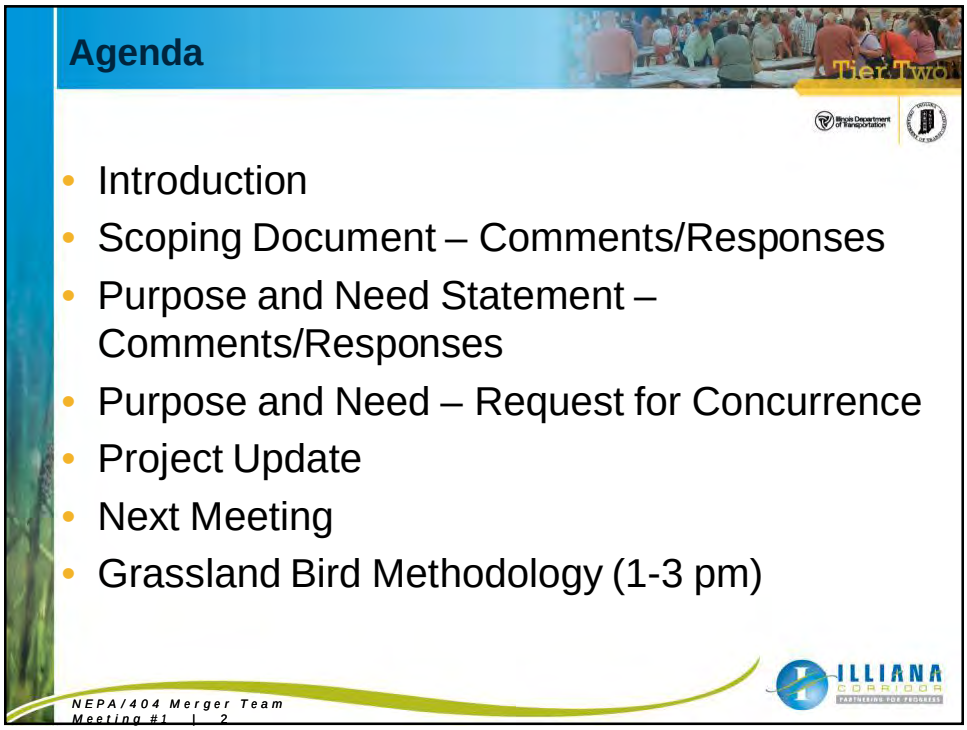
Illiana Corridor
NEPA/404 Merger Team
Meeting
April 16, 2013
Tier Two
Illinois Department of Transportation


Agenda
Tier Two
Introduction
Scoping Document – Comments/Responses
Purpose and Need Statement – Comments/Responses
Purpose and Need – Request for Concurrence
Project Update
Next Meeting
Grassland Bird Methodology (1-3 pm)
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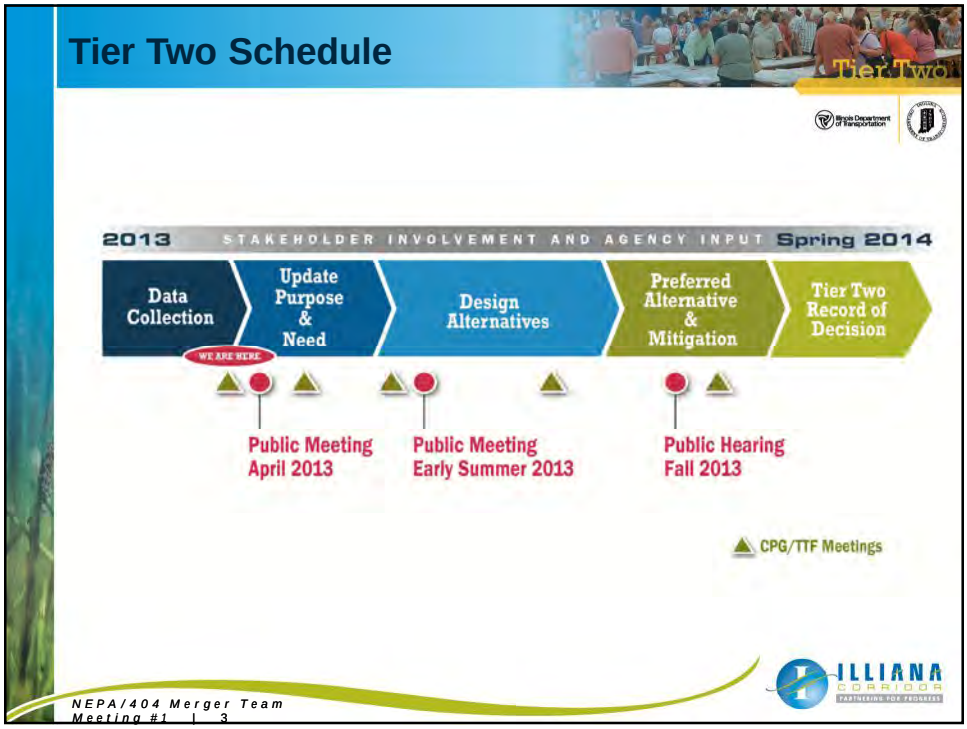
NEPA/404 Merger Team
Meeting #1 | 2


Tier Two Schedule
Tier Two
2013
STAKEHOLDER INVOLVEMENT AND AGENCY INPUT
Spring 2014
Data Collection
Update Purpose & Need
Design Alternatives
Preferred Alternative & Mitigation
Tier Two Record of Decision
WE ARE HERE
Public Meeting April 2013
Public Meeting Early Summer 2013
Public Hearing Fall 2013
CPG/TTF Meetings
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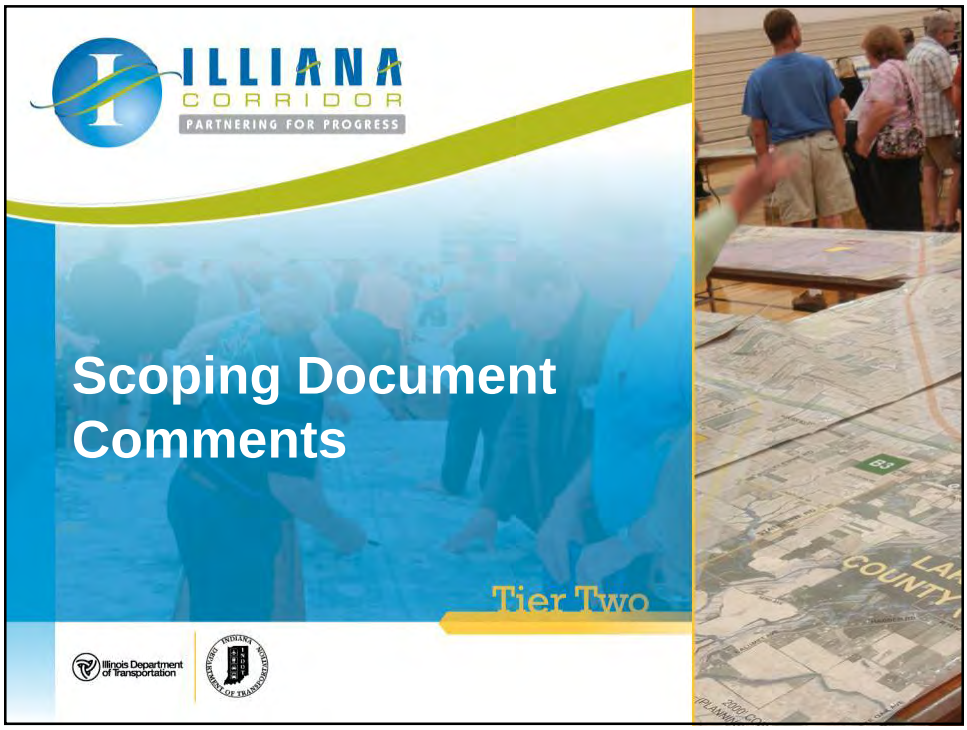
NEPA/404 Merger Team Meeting #1 | 3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Scoping Document Comments
Tier Two
Illinois Department of Transportation

Scoping Document Comments

- Interagency scoping meeting held: February 22, 2013
- Comment period closed: March 15, 2013
- Comments received (4):
  - Midewin National Tallgrass Prairie
  - U.S. Army Corps of Engineers
  - IDNR, Indiana SHPO
  - IDEM

Scoping Document Comments

- *Midewin National Tallgrass Prairie*
  - *Comment: Emphasized significance of IL-53 alternatives near Midewin National Tallgrass Prairie due to:*
    - *Impacts to social and ecological resources at Midewin*
    - *Economic and social impacts to local Elwood and Wilmington communities*
    - *Potential impacts to historic Route 66*
  - Response: Several IL-53 interchange alternatives are being considered and the analysis will address impacts to the noted resources.

Scoping Document Comments

Tier Two

- *U.S. Army Corps of Engineers*
  - *Comment: Consider multiple IL-53 alternatives near Midewin National Tallgrass Prairie due to potential impacts to:*
    - *Historic Route 66*
    - *Social and ecological resources at Midewin*
  - Response: Several IL-53 alternatives will be considered near Midewin National Tallgrass Prairie and the analysis will address impacts to the noted resources.
  - *Comment: Consider high quality natural resources in Cedar Lake Area and potential T&E species impacts.*
  - Response: High quality natural resources in the Cedar Lake Area and potential T&E species are being considered in the impacts analysis.

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Scoping Document Comments

Tier Two

- *U.S. Army Corps of Engineers (cont.)*
  - *Comment: Identify and prioritize mitigation options for permanent fill placed in jurisdictional WOUS.*
  - Response: Mitigation options for permanent fill placed in jurisdictional WOUS are being identified.
  - *Comment: Provide additional details on alternatives to be considered.*
  - Response: Additional details on alternatives to be considered will be provided during the NEPA/404 process.

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Scoping Document Comments

- *U.S Army Corps of Engineers (cont.)*
  - *Comment: Ensure study is in concurrence with MOU among FHWA, Illinois SHPO, IDOT, and Federally Recognized Tribes Interested in Illinois Lands Regarding Tribal Consultation requirements for the Illinois Federal Transportation, ratified August 31, 2011.*
  - Response: The Study process will be implemented in concurrence with the established MOU among FHWA, Illinois SHPO, IDOT, and Federally Recognized Tribes Interested in Illinois Lands Regarding Tribal Consultation requirements for the Illinois Federal Transportation, as approved August 31, 2011.

Scoping Document Comments

- *U.S Army Corps of Engineers (cont.)*
  - *Comment: Study should include the development of a post construction Best Management Practice (BMP) concept plan.*
  - Response: A post-construction Best Management Practice (BMP) concept plan is being developed.

Scoping Document Comments

- *IDNR, Indiana SHPO*
  - *Comment: Study could have effects on historical and archaeological properties in Lake County, Indiana, and in Kankakee and Will counties, Illinois.*
  - Response: Potential effects on historical and archaeological properties in Lake County, Indiana, and in Kankakee and Will counties, Illinois are being coordinated with the Indiana and Illinois SHPOs.
  - *Comment: Other prospective Indiana consulting parties may not have a detailed understanding of the Section 106 process or what their role is in the process.*
  - Response: The Consulting Parties will be engaged during the Section 106 process with several meetings to obtain their comments on the project.

Scoping Document Comments

- *IDNR, Indiana SHPO (cont.)*
  - *Comment: Suggest additional information about the steps and timetable of the Section 106 process be provided as soon as possible to those parties who accept the invitation to participate in this consultation.*
  - Response: Additional information about the steps and timetable of the Section 106 process will be provided in mid-June to those parties who accepted the invitation to participate in this consultation.
  - *Comment: Suggest the door be left open to parties who have not accepted invitation to participate and to other parties not already yet identified that demonstrate a legitimate interest in the project.*
  - Response: The process will remain public through both NEPA and Section 106 processes.

Scoping Document Comments

Tier Two

- *IDEM*
  - *Wetland Evaluation Comments:*
    - *All wetlands be identified, delineated, and classified in accordance with established ACOE and Indiana guidance. This would include wetlands that extend beyond project boundaries.*
    - *Submit the delineation report to ACOE and IDEM and schedule multiple agency site visits for field verification.*
  - Response:
    - Wetlands within the project corridor will be identified, delineated, and classified in accordance with established ACOE and Indiana guidance with adjacent wetlands documented using GIS.
    - The delineation report will be submitted to ACOE and IDEM and agency site visits for field verification are planned.

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Scoping Document Comments

Tier Two

- *IDEM (cont.)*
  - *Wetland Compensatory Mitigation Comments:*
    - *Preferred alternative should avoid and minimize wetland impacts to the greatest extent practical.*
    - *Mitigation options for unavoidable impacts to jurisdictional wetlands should be provided in accordance with established ACOE and Indiana guidance and coordinated with ACOE and IDEM.*
    - *Impacts to rare and ecologically important wetland types must be avoided as mitigation cannot offset those impacts.*
    - *Coordinate with ACOE & IDEM before finalizing mitigation site selection and design.*
    - *Kankakee Sands Mitigation Bank may be viable option, but only after agency consultation.*
  - Response: Concur with the comments noted above

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Scoping Document Comments

- *IDEM (cont.)*
  - *Comment: Stream assessments must be completed in accordance with IDEM Assessment Branch, IDNR, and USFWS assessment methods:*
    - *Field investigations*
    - *Stream habitat assessments using QHEI and HHEI (IN).*
    - *Fish and mussel surveys to assess species diversity to determine if any State or Federally listed rare, threatened, or endangered species are present.*
    - *Macroinvertebrate surveys to help determine overall water quality and level of stream habitat.*
  - Response: Concur with the comments noted above.

Scoping Document Comments

- *IDEM (cont.)*
  - *Comment: Riparian Corridor Assessment must be completed in accordance with IDEM Assessment Branch, IDNR, and USFWS assessment methods:*
    - *Mean width of riparian corridor in the proposed alternatives*
    - *Density of trees within the riparian corridor*
    - *Tree species inventory*
    - *Wetlands, waterways, or other drainage features within the riparian corridor*
    - *Identification of suitable Indiana Bat habitat within the riparian corridor or if surveyed*
  - Response: Concur with the completion of a Riparian Corridor Assessment
    - Tree study will be completed using transects and sample plots.
    - Prior Consultation (2012) with USFWS was completed for Indiana Bat survey locations.

Scoping Document Comments

- *IDEM (cont.)*
  - *Comment: Evaluate the stability of stream banks upstream and downstream from any proposed crossing.*
  - Response: A protocol for evaluating the stability of stream banks upstream and downstream from proposed crossings is being developed.

Scoping Document Comments

- *IDEM (cont.)*
  - *Stream Compensatory Mitigation Comments:*
    - *Before mitigation is proposed, the Section 401 WQC review process requires avoidance and minimization.*
    - *Mitigation options for stream impacts should be provided in accordance with established Indiana guidance.*
    - *When choosing the preferred alternative converting ephemeral, intermittent and perennial streams into roadside ditches should be avoided.*
    - *To avoid this circumstance, all streams should be crossed in perpendicular manner.*
    - *If you propose to convert streams into roadside ditches you need to provide a sufficient justification.*
  - Response: Concur, while acknowledging that preliminary design and drainage studies are underway for each watercourse crossed by the alignment.

Scoping Document Comments

Tier Two

- *IDEM (cont.)*
  - *Design Concepts Comment:*
    - *IDEM prefers the least environmentally damaging design for interchanges and bridge crossings be selected.*
  - Response: Alternative interchanges and bridge crossings are being designed to avoid and minimize wetland and stream impacts to the greatest extent practical.

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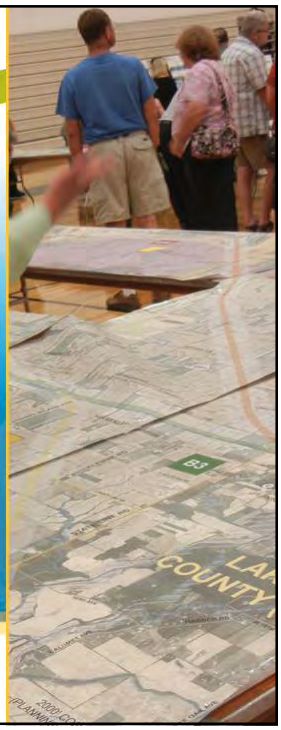
Purpose and Need Statement

Tier Two

Illinois Department of Transportation



Purpose and Need

Tier Two

Major Purpose and Need points remain the same:

- Alleviate Local System Congestion and Improve Local System Mobility
- Improve Regional Mobility
- Provide for Efficient Movement of Freight

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Purpose and Need: Updates

Tier Two

- Updated to indicate Corridor B3 as the selected alternative of the Tier One Single Document FEIS/ROD
- Updated to indicate the project is funded through the Tier Two EIS, and that further coordination will be needed with CMAP and NIRPC for inclusion in their long-range regional plans
- Added "in a manner consistent with the commitments in the Tier One Record of Decision" to the Purpose statement

Comment deadline was April 14, 2013

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Purpose and Need
Comments
Tier Two
Illinois Department of Transportation

Purpose and Need Comments
Tier Two
Concurs with Purpose and Need
IDEM
IDNR, Indiana SHPO
Comments on Purpose and Need
Midewin Tallgrass Prairie Alliance
CMAP
Joint Organization Comments (Center for Neighborhood Technology, et al.)
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Purpose and Need Comments

- Midewin Tallgrass Prairie Alliance
  - *Comment: Concern that Corridor B3 will do little to address or mitigate intermodal freight and truck traffic associated with the two, large CenterPoint Intermodal facilities and associated, nearby warehouses.*
  - Response: The CenterPoint Intermodal facilities are located in the northwestern portion of the study area. As shown in the Tier One EIS, the B3 corridor improves South Sub-Region VHT, as well study area VHT and VMT on arterials in the study area, resulting in travel benefits to the CenterPoint intermodal facilities.
  - *Comment: Concern that Corridor B3 will not alleviate local congestion and will not improve local system mobility at the west end of the Study Area.*
  - *Response: The Tier One EIS demonstrated that the B3 corridor improved local system congestion and mobility, including reductions in study area congested VMT and VHT on study area arterials. In the western portion of the study area, there are projected increases in daily traffic of approximately 3,400 on IL-53 through Midewin (assuming an interchange at IL-53 and a tolled scenario), there are also projected decreases in daily traffic of approximately 2,800 on S. Arsenal Rd. and 3,600 on Peotone Road, as well as other decreases in traffic on other east-west streets in the western portion of the study area.*

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Purpose and Need Comments

- Midewin Tallgrass Prairie Alliance
  - *Comment: Potential impacts on existing peripheral highways need to be determined and plans for mitigation made before the Illiana is allowed to move forward.*
  - Response: Not a specific Purpose and Need comment. However, the Tier Two EIS will address potential environmental impacts for sensitive areas on peripheral highways, such as IL-53 through Midewin.

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Purpose and Need Comments

- CMAP
  - *Comment: Demographic forecasts used for Study are inconsistent with the region's GO TO 2040 Plan.*
  - Response: Coordination with CMAP on demographic forecasts since June 2011. CMAP approved Illiana market-based forecast methodology. At the February 14, 2013 coordination meeting, CMAP and IDOT agreed that what was needed was to understand the differences between the CMAP GO TO 2040 forecasts and the Illiana forecasts, and that the Illiana project did not have to use the CMAP forecasts.
  - *Comment: P&N Statement suggests the northern portion of the South Sub-Region, including I-80, is fully developed with limited infill opportunities is inconsistent with CMAP analysis.*
  - Response: The northern portion of the South Sub-Region that includes I-80 is developing and is expected to reach holding capacity before 2040.

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Purpose and Need Comments

- CMAP (cont.)
  - *Comment: Provide CMAP an opportunity to review the "committed projects and those financially constrained major transportation projects" to ensure they are consistent with the regional transportation planning process.*
  - Response: Committed projects originally presented at August 11, 2011 CPG meeting (CMAP is a member of CPG), and is included in Transportation System Performance Report, Alternatives to be Carried Forward Technical Memorandum, the DEIS, and FEIS. At the March 15, 2013 coordination meeting, CMAP said that wanted to digest the information and will get back to IDOT.
  - *Comment: Agree there is a strong case for addressing growth in long distance trucks. Encourage the study more thoroughly examine current and forecasted freight traffic based on GO TO 2040 forecasts to determine if corridor should be focusing on improving freight movement.*
  - Response: The Illiana Corridor Study put considerable effort into modeling freight movement by truck, including development of a national truck model and a new regional truck model. CMAP has praised the study for this effort. Again, going back to the first CMAP comment, it was agreed that the project would not have to use the CMAP GO TO 2040 forecasts.

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Purpose and Need Comments

- Joint Comments (CNT, ELPC, Midewin Tallgrass Alliance, Openlands, Sierra Club IL Chapter, The Nature Conservancy, The Wetlands Initiative, Prairie Rivers Network, Illinois Audubon Society, Midewin Heritage Association)
  - *Comment: Our organizations call on the agencies to reopen the Tier 1 study process to evaluate alternatives that respond to real, existing transportation needs with solution that are far less speculative and costly that the agencies' proposed multi-billion-dollar tollway in the B3 corridor.*
  - Response: A comprehensive planning process was performed in Tier One that defined the Purpose and Need and identified and evaluated a wide range of alternatives with significant public outreach. Tier One was completed with a Record of Decision signed on January 17, 2013.
  - *Comment: The agencies market-based forecast for 2040 reflect outdated assumptions of business as usual -- that historic trends of suburban sprawl (in some areas) will continue all around the Illiana study area despite the MPO's ongoing implementation of policies that will discourage such development.*
  - Response: As documented in the Tier One EIS, the market-based forecasts are based on a number of factors, including historic trends, Woods & Poole economic forecasts, land available for development, population holding capacity, local land use plans, and demographic factors, such as household size and migration.

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Purpose and Need Comments

- Joint Comments (cont.)
  - *Comment: The agencies' unreasonable rejection of the MPO forecasts illegitimately usurps the role of regional planning form the MPOs.*
  - Response: IDOT and INDOT have coordinated with both CMAP and NIRPC on the forecasts. CMAP approved the Illiana forecast methodology. At the February 14, 2013 coordination meeting, CMAP and IDOT agreed that what was needed was to understand the differences between the CMAP GO TO 2040 forecasts and the Illiana forecasts, and that the Illiana project did not have to use the CMAP forecasts.
  - *Comment: For the Indiana portion of the study area, NIRPC had forecast a population growth of 19.8% and employment growth of 27.9% by 2040. The agencies' analysis is based on 176% population growth and 225% employment growth.*
  - Response: The correct figures are NIRPC expects 32% growth in population (an increase of 24,000 persons) for the study area and Illiana expects 66% growth (an increase of 50,000 persons). For employment, NIRPC expects 9% growth in employment (an increase of 2,000 jobs), and Illiana expects 55% growth (an increase of 29,000 jobs).

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Purpose and Need Comments

- Joint Comments (cont.)
  - *Comment: The determination that the Illiana study area is now ready for take-off is problematic, because it relies on the construction of the Illiana Expressway itself. This over-statement of expected population and employment growth infects the Purpose and Need as existing and future travel demand in the region is driven by growth in population, employment, and commuter traffic, and needs to increase regional mobility and alleviate local system congestion.*
  - Response: The Illiana 2040 No Build forecasts assume that the Illiana Corridor is not built.
  - *Comment: The Purpose and Need must include a discussion of the MPO's 2040 population and employment forecasts, and any transportation needs associated with them. The agencies have not coordinated their forecast with those of the MPO forecasts.*
  - Response: As stated in the Purpose and Need, IDOT and INDOT have coordinated with the MPOs on the forecasts. CMAP approved the Illiana forecast methodology. At the February 14, 2013 coordination meeting, CMAP and IDOT agreed that what was needed was to understand the differences between the CMAP GO TO 2040 forecasts and the Illiana forecasts, and that the Illiana project did not have to use the CMAP forecasts.

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Purpose and Need Comments

- Joint Comments (cont.)
  - *Comment: Request IDOT and INDOT to drop consideration of the B3 corridor, and instead consider how local transportation alternatives might better resolve potential traffic congestion, and evaluate alternatives that improve our existing network of roads and invest in more sustainable and livable transportation solutions for our region.*
  - Response: A comprehensive planning process was performed in Tier One that defined the Purpose and Need and identified and evaluated a wide range of alternatives with significant public outreach. Tier One was completed with a Record of Decision signed on January 17, 2013.

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Purpose and Need – Request for Concurrence
Tier Two
Illinois Department of Transportation

Discussion
Tier Two
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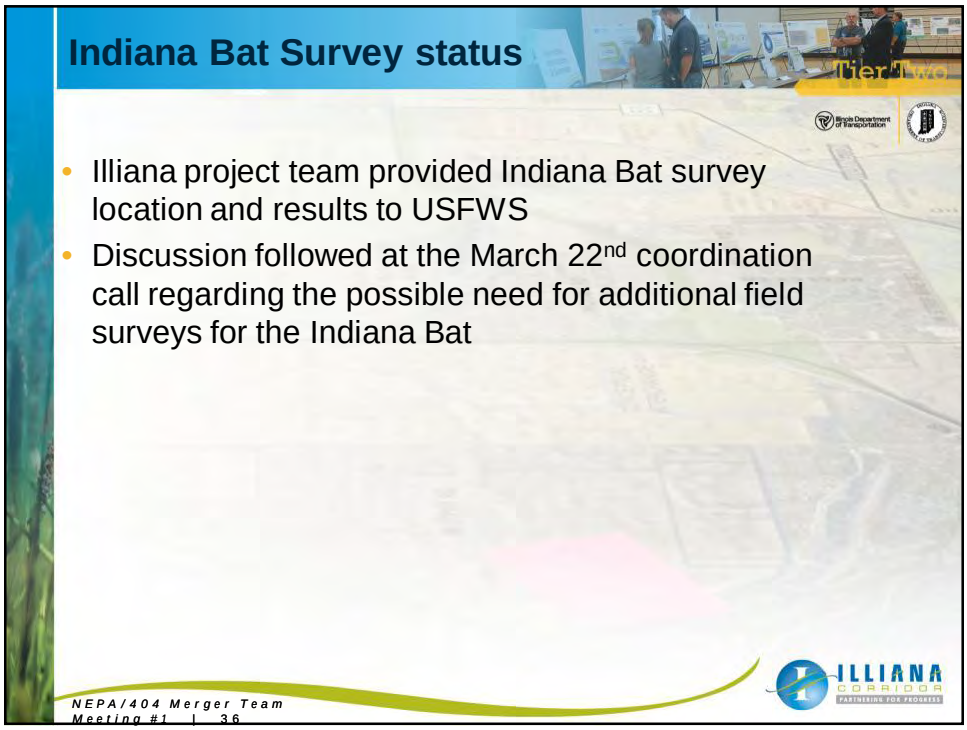
Project Update
Tier Two
Illinois Department of Transportation


Indiana Bat Survey status
Tier Two
Illinois Department of Transportation
Illiana project team provided Indiana Bat survey location and results to USFWS
Discussion followed at the March 22nd coordination call regarding the possible need for additional field surveys for the Indiana Bat
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Tier Two Stakeholder Outreach

Tier Two

January - April

- 45 one-on-one stakeholder meetings (local governments, schools, EMS)
- CMAP and NIRPC staff technical coordination meetings

February

- 5 landowner meetings (approximately 850 attendees involving over 400 landowners)
- CMAP Tier II consultation meeting, February 14th

March

- Tier Two Corridor Planning Group #1 meeting, March 14th
- 2 CSS workshops: Midewin-Wilmington, March 13th; IL-53 Corridor Planning Group, March 20th

April

- Land Use Task Force #1 meeting, April 10th
- Tier Two Public meetings: April 16th – Peotone, IL; April 18th – Cedar Lake, IN
- NIRPC Committees and Commission meetings: April 9th, 11th, and 18th
- Kankakee Co. Land Use/Transportation Task Force, April 18th
- Land Use Task Force #2 meeting, April 30th
- Tier Two Corridor Planning Group #2 meeting, April 30th

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Section 106 Coordination Status

Tier Two

HPR = Historic Property Report
DOEs = Determinations of Eligibility
CP = Consulting Parties
EAR = Effects Assessment Report

	May	June	July	August	Sep
HPR to INDOT/receive IDOT DOEs	Anticipated May 3				
HPR & DOEs to SHPOs & CP for review	Anticipated May 15				
Receive SHPOs & CP comments on HPR & DOEs		Anticipated June 17			
Hold joint CP meeting		Anticipated week of June 17			
EAR to INDOT/IDOT for review			Anticipated June 27		
EAR to both SHPOs & CP for review			Anticipated July 9		
Receive SHPOs & CP comments on EAR				Anticipated Aug 8	
Hold joint CP meeting			Anticipated week of Aug 12		
Hold joint CP mtg (MOA)				Anticipated mid-Sep after DEIS	

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Next Steps
Tier Two
Illinois Department of Transportation

Next Steps
Tier Two
Agency Field Visit: scheduled in mid to late May due to delay in spring field conditions.
Next Monthly Meeting: tentatively scheduled for week of May _____.
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NEPA/404 Merger Meeting
April 16, 2013
Indianapolis, IN

Name	Organization	Phone No.	E-mail
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Kent Ahrenholtz	DLZ	812/455-1116	kahrenholtz@dlz.com
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John Carr	IDNR-DHPA (IN-SHPO staff)	317-233-1949	JCarr@dnr.in.gov

NEPA/404 Merger Meeting
April 16, 2013
Chicago, IL

(A.M.)

Name	Organization	Phone No.	E-mail
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~~Video~~/Phone/Webinar Darren Gove	IEPA		
David McGibbon	PB		
Elizabeth McClaskey	USFWS		
Laura Hilden	INDOT		
Neel Vanikar	FHWA-HQ		
Scott Twait	IEPA		
Terry Savko	IDOA		
Glenn Morris	FHWA-HQ		
Jim Earl	INDOT		
Jeremy Sheets	JF New		
Qaddumi			
Liz Pelloso	USEPA		
Brian Smith	AECOM		
Vanessa Ruiz	IDOT		

A.M.

NEPA/404 Merger Meeting
April 16, 2013
Springfield, IL

Name	Organization	Phone No.	E-mail
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Joseph Merritt	UofI, INHS	724-331-6671	JFMERRITT@NETZERO.COM
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Tom Brooks	IDOT	217-785-2943	thomas.brooks@illinois.g

Illiana Corridor
Phase I Study

RESOURCE AGENCY
NEPA/404 MERGER TEAM MEETING SUMMARY

Date:	**April 16, 2013**
Time:	**9:00 AM**
Location:	**U.S. Environmental Protection Agency, 77 W. Jackson Blvd., Chicago, IL**
Attendees:	**See attached Meeting Sign-In Sheets**

On April 16, 2013 the Illiana Corridor Tier Two study was presented to the NEPA/404 Merger Team at a meeting held in USEPA's Chicago office. This was the third presentation of the Tier Two study to the NEPA/404 Merger group, the first being the Scoping presentation of February 22, 2013 at USEPA in Chicago, and the second, an informational conference call on March 22, 2013. The purpose of the presentation was to present comments received on the Scoping Document and the Draft Purpose and Need for the Tier Two study, to request concurrence on the draft Purpose and Need statement, and to provide an update on other ongoing activities associated with the study.

The meeting agenda included the following discussion points:

- Introductions
- Response to agency comments on the Scoping Document
- Response to agency comments on the draft Purpose and Need statement
- Concurrence on Purpose and Need
- Project Update

The meeting was guided by a PowerPoint presentation presented by S. Schilke, S. Ott and R. Shimizu (copy attached). In the presentation, a topic-by-topic summary of comments received and preliminary responses on the Scoping Document and draft Purpose and Need statement were reviewed. It should be noted that in the review of draft Purpose and Need statement comments, a small revision of the Purpose and Need language was recommended at the bottom of page 1-2. This revision is as follows: "*The northern portion of the South Sub-Region that includes I-80 is ~~fully~~ develop~~ed~~ing and is expected to reach holding capacity before 2040 ~~with limited infill opportunities~~.* This was followed by a request for concurrence on Purpose and Need made by M. Fuller of FHWA. The meeting concluded with an update on Indiana Bat field surveys, public outreach activities, upcoming Section 106 coordination, and an anticipated schedule for field reviews.

Discussion occurred during and following the presentation of comments received on the Scoping Document and the following questions and/or comments were made:

- S. Hall commented that the Tribal letters should be addressed individually rather than as a general form letter in effort to show more respect to the individual tribal nations. M. Fuller indicated this approach has been standard practice and stated FHWA has had no objections to this communication approach.
- S. Hall inquired about the timing for completion of wetland delineation reports. V. Ruiz stated that the Illinois reports would be ready by mid-May; S. Ott confirmed the Indiana reports will follow later in the month due to poor spring conditions and the need to complete the remaining surveys in Indiana.
- S. Hall also asked about possible wetland field review dates for scheduling purposes. After some discussion, it was agreed that this would be considered for early June given the slow progress of the 2013 growing season. T. Brooks confirmed that he will coordinate the Illinois field studies with staff of INHS and the Corps. S. Hall also stated that the Illinois field review will be completed separate from Indiana, and that Paul Leffler will be the Corps point of contact for this part of the review.
- N. West inquired if a tree survey would be completed as part of the Phase 1 study. V. Ruiz responded that where needed it is accepted practice for EIS studies to complete a tree study using transects and sample plots within the 400-foot corridor. This would sufficiently capture the information necessary to make impact assessments.
- S. Ott concluded the discussion indicating a Scoping Summary document would be prepared, similar to that issued for the Tier One scoping process. It will summarize scoping activities completed, comments received, and outline issues to be addressed in the Tier Two Environmental Impact Statement.

Discussion occurred during and following the presentation of comments received on the Draft Purpose and Need statement and the following questions and/or comments were made:

- W. Spang commented that the Purpose and Need should be written more specifically to address the separation of traffic (regional v. local), and truck traffic, along with goals to preserve, protect and enhance environmental resources. S. Schilke indicated that IDOT cannot separate traffic on state roadway facilities, particularly those designated truck routes such as IL-53; therefore, it's not possible to incorporate this concept into the Purpose and Need statement. He continued, that while the Illiana Corridor will not solve truck traffic on local roads, it will provide more direct access for traffic associated with area intermodal facilities. M. Fuller commented that as a transportation agency protection of the environment is more typically addressed through mitigation and enhancement measures associated with those determined to be unavoidable impacts.
- N. West stated that the Purpose and Need statement is not sufficiently detailed for this Tier Two study, and the concerns of local constituents regarding context sensitive solutions should be more expressly incorporated into the purpose of the project. Such considerations would include agriculture, natural resources, waters, and recreation trails, and other local resources. Rather than a market-

driven approach, a policy-oriented, regional planning approach should be taken, and include sustainable/livable/green corridors elements.

- M. Fuller responded that, as a transportation project, the purpose and need is focused appropriately on transportation issues. It was pointed out that the current Purpose and Need statement and the Tier One Purpose and Need include reference to sustainability. While the wording of Purpose and Need within the Tier One Record of Decision (ROD) and Final Environmental Impact Statement (FEIS) are not exact since the ROD summarizes the FEIS, M. Johnson clarified they are to be treated as a single document, while N. Vanikar stated that the documents (EIS and ROD) are now encouraged to incorporate more content by reference under the approved MAP 21 legislation.
- M. Fuller also noted that the project needs to move past Purpose and Need to proceed with alternatives development and to begin the more detailed engineering and environmental analyses associated with the next phase of study.
- E. McCloskey inquired how the project will alleviate local road traffic with the number of proposed road closures. The area east of US 41 was mentioned specifically. S. Schilke responded that approximately 70 percent of the roads are proposed to remain open. The project team has undertaken, and will continue extensive outreach with local stakeholders, including emergency service providers, schools and local farmers to complete the analysis. Additionally, local land use plans are also being reviewed with community representatives in order to determine the location of under/over passes. While this is an on-going process, it requires a balance of a number of issues.
- E. McCloskey also commented on the figures shown in the Purpose and Need statement, and why the locations of IN 2 and IL 114 are not shown or are incomplete. IDOT responded that the traffic model does account for those areas of the system just outside the study area and that the team coordinated with Kankakee County. The maps will, however, be revised to show these roadways.
- M. Buffington stated that the Indiana Department of Natural Resources, Division of Fish and Wildlife will be providing written concurrence on Purpose and Need.
- M. Fuller polled the agencies for concurrence with Purpose and Need. USACE and USFWS concurred with USEPA concurring with reservation absent the inclusion of green corridor and sustainability principles. Concurrences were also received from the Illinois Department of Agriculture and Illinois EPA; no representative from the Illinois Department of Natural Resources was present.

Project updates were provided by S. Ott and S. Schilke with reference to the PowerPoint presentation. The following comments were made:

- S. Cirton clarified his April 4, 2013 request to survey six additional locations for the Indiana Bat in Illinois. IDOT/BDE and USFWS will coordinate on the location of appropriate mist netting sites, consulting with staff from the Forest Preserve District of Will County.
- There was off-topic discussion of the protocols for conducting Indiana Bat surveys and notification of the local USFWS office. Indiana USFWS stated that it is a mist netting permit requirement that the agency be notified prior to such

activities, and that an authorization needs to be obtained from USFWS for handling federally listed species.

- It was agreed that agency field visits for wetland review will occur the week of June 10th with separate visits to be scheduled in Illinois and Indiana.
- W. Zyznieuski confirmed that the Tribes are typically engaged by both written correspondence and the established electronic database notification system.
- J. Carr commented that IN SHPO staff needs to be consulted in advance when selecting dates to meet with the Consulting Parties.

The next meeting in May will be convened as a conference call and M. Fuller will confirm with the participants a preferred date for the week of May 20, 2013.

The meeting concluded at approximately 11:50 AM.

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Schaumburg, Illinois 60196

100 N Senate Avenue, #N642
Indianapolis, Indiana 46204

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MEETING SIGN-IN SHEET

Date: 5/13/13

Location: US FISH + WILDLIFE BARRINGTON IL

Purpose: SECTION 7 CONSULTATION

	Name	Representing	Email Address
1.	Rick Powell	Parsons Brinckerhoff	powellw@pbworld.com
2.	Shawn Cirton	USFWS	shawn_cirton@fws.gov
3.	Jim Novak	Huff + Huff	jnovak@hoffnhuff.com
4.	Vanessa Ruiz	IDOT - D1	vanessa.ruiz@illinois.gov
5.	Steve Otts	Parsons Brinckerhoff	otts@pbworld.com
6.	KATIE KUKIELKA	AECOM/IDOT	KATIE.KUKIELKA@ILLINOIS.GOV
7.	Steve Schilke	IDOT	Steven.Schilke@illinois.gov
8.	Lailah Reich	Huff & Huff	lreich@huffnhuff.com
9.			
10.			
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16.			
REMOTE: 17.	JIM GALL	INDOT	
18.	RICK LAMPONG	PB	
19.	MATT FULLER	FNWA	
20.	KENT ANNENHOLTZ	DLZ	
21.	ROGER Klocek	HUFF + HUFF	
22.	SUE HARGROVE	IDOT	
23.	PETE KNYSZ	CBBEL	
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25.			

Illiana Corridor
Phase I Study

RESOURCE AGENCY BIOLOGICAL ASSESSMENT COORDINATION MEETING SUMMARY

Date:	**May 13, 2013**
Time:	**9:00 AM**
Location:	**U.S. Fish & Wildlife Service, 1250 Grove Street, Barrington, IL**
Attendees:	**See attached Meeting Sign-In Sheets**

The Illinois Natural History Survey (INHS) completed many of the biological surveys for the Illiana project. During the 2012 mussel surveys conducted in the Kankakee River, a fresh dead shell of the federally endangered sheepnose mussel (*Plethobasus cyphyus*) was found approximately 1,200 feet south of the B3 corridor. Because of its proximity to the preferred alignment, the Illiana project team indicated that for the purposes of coordination, it will be assumed that the sheepnose mussel is located in the corridor and therefore there is a potential for impacting the species. As a result, the project team initiated informal Section 7 Consultation with the US Fish & Wildlife Service (USFWS).

The meeting agenda for this purpose included the following discussion points:

- Introductions
- Initiation of Section 7 Consultation – sheepnose mussel
- Other Topics
    - Eastern Prairie Fringed Orchid (EPFO) Survey Locations
    - Status of Indiana Bat Mist-Net Surveys

S. Schilke and S. Ott provided a brief summary of the status of the project. J. Novak summarized the INHS mussel report which confirmed that a fresh dead shell of the federally endangered sheepnose mussel was found approximately 1,200 feet south of the proposed B3 corridor during surveys in the Kankakee River. No other federally listed mussels were identified in the project area. Because of this find and the proximity to Corridor B3, IDOT indicated that they will assume the presence of the mussel within the project limits. As a result, IDOT requested the project team to compile a Biological Assessment (BA) in anticipation of the formal Section 7 Consultation.

S. Cirton indicated that the USFWS is in the technical assistance stage of the review. The informal review begins with a review of the BA, which determines whether formal consultation is necessary. Therefore, S. Cirton stated that he needs to review the BA prior to any discussion of formal consultation.

At the time, it was not known if piers will be constructed in the Kankakee River for the bridge, which would be considered a permanent impact. All other impacts will be considered temporary for construction. J. Novak indicated that temporary impacts could

include the use of causeways constructed in the river by the contractor. At this stage, the project team will assume the worst case scenario to allow the contractor flexibility during construction. R. Powell indicated that the use of causeways is a practical method for construction of a bridge this large. It could potentially save approximately $20 million versus constructing the bridge from the shore. R. Powell indicated that coffer dams could also be used during construction.

S. Schilke indicated that the actual location of the crossing of the Kankakee River has not been finalized because of the discovery of an historic site on the east bank of the river near the preferred alignment. IDOT is currently coordinating this issue with the State Historic Preservation Officer (SHPO); however, the alignment is not expected to vary much from the current design.

S. Schilke asked if the use of piers in the river would be considered a fatal flaw. S. Cirton stated that he does not think piers would be a fatal flaw at this time. J. Novak indicated that as part of the BA, commitments will be made to conduct mussel surveys and relocate all native mussels found during the surveys prior to construction to minimize and avoid impacts.

J. Novak asked if the outline provided by USFWS should be used, since there are some variations with outlines on their website. S. Cirton indicated this outline is based on recent reviews their office has completed and the project team should follow this example. S. Cirton indicated that once he receives the BA, he has 30 days to review and comment. The USFWS has 180 days to complete the Biological Opinion if formal consultation is required.

M. Fuller indicated that the review timelines are critical as the Record of Decision cannot be signed until the Section 7 consultation is completed. M. Fuller, reviewing policy indicated that a summary of the BA and agency coordination is required for the Draft EIS. Approval of the BA for the Draft EIS is not required. Indiana uses a Limited Take Process which is somewhat different from what Illinois requires. S. Cirton said to make sure that all species listed for Will and Lake counties are included in the BA regardless of whether there are potential impacts to additional species.

S. Cirton will need to check to see if a separate BA for Illinois and Indiana will be required for the entire project since this project crosses state lines and USFWS jurisdictional offices or if a single BA document can be prepared.

Additional topics discussed concerned other federally-listed species potential involvement. For the Indiana bat, additional areas near the proposed I-65 interchange were added to the project and a 2013 survey is needed for these areas. The INHS will be conducting surveys for the additional areas in Illinois after June 1. S. Cirton has been in constant contact with the Illinois survey teams and will be working closely with them. S. Cirton indicated that there are new protocols this year on bat surveys. This information will be passed on to the survey teams. The INHS bat report will be completed by the end of July 2013.

J. Novak produced a table summarizing all wetland sites in Illinois that have floristic quality indices over 20, which is the threshold for potential surveys for the eastern prairie fringed orchid (EPFO). The table also calls out plant associates of the EPFO. S. Cirton will review the list and coordinate the locations of additional EPFO surveys. S. Hargrove indicated that the INHS has identified some basal rosettes of unidentified orchids during their surveys last year. The INHS will attempt to confirm species type during this year's survey.

S. Cirton requested a copy of the wetland delineation and botanical survey reports. IDOT directed Huff & Huff to prepare CD's for distribution to the federal agencies. J. Novak will hand deliver the document to USFWS by Wednesday, May15, 2013.

J. Novak asked about the permit information related to the JATA site and the grassland bird information. S. Cirton responded that he has the permit number, but cannot locate the entire Decision Document from the Corps of Engineers. When he gets back to his office at the Corps of Engineers, he will check further to get information on the bird mitigation.

The meeting concluded at approximately 10:30 AM.

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MEETING SIGN-IN SHEET

Date: 5/13/13

Location: US FISH + WILDLIFE BARRINGTON IL

Purpose: SECTION 7 CONSULTATION

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6.	KATIE KUKIELKA	AECOM/IDOT	KATIE.KUKIELKA@ILLINOIS.GOV
7.	Steve Schilke	IDOT	Steven.Schilke@illinois.gov
8.	Lailah Reich	Huff & Huff	lreich@huffnhuff.com
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NEPA/404 Merger
Monthly Illiana Corridor Informational Meeting Agenda

Conference Call
May 22, 2013
10:00 AM CDT/11:00 EDT

IDOT, INDOT, FHWA-IL and IN Division and federal/state resource agencies attending remotely by webinar/phone conference:

Toll Free No: 877-336-1839
Access Code: 5289000

Webinar access: https://connectdot.connectsolutions.com/il-nepa404/

Agenda Items:

1. Introductions
2. Alternatives to be Carried Forward
    - B3 environmental footprint – changes since Tier One working alignment
    - Design Options @ Interchanges
    - Road connectivity status
    - Minor excursions outside the Tier One 2000' Corridor
    - Tolling/Non tolling status
    - Addition of Lorenzo Road interchange to project limits
3. Environmental Coordination
    - Sheepnose Mussel BA
    - Indiana Bat and Eastern Prairie Fringed Orchard 2103 Field Surveys
    - Section 106 Coordination
    - BMP discussion
4. Public Involvement Update
    - Tier Two Public Meeting #1 Recap
    - CPG/TTF #2 Recap
    - Upcoming Meetings (CPG/TTF #3, T2 Public Meeting #2)
5. P3 Activities
    - Industry Forum – June 24-25, 2013

Tier Two NEPA Merger Meeting Handouts

Prepared For:

Tier Two Environmental Resource Database and Road Connectivity Maps

May 2013

Tier Two Environmental Resource Database

In support of the Tier Two studies, the geographic information system (GIS) data collected during the Tier One process was used as a database baseline and refined as part of the Tier Two studies. Additional data collected from resource agencies and field surveys performed during Tier Two are being integrated into the GIS database. The GIS database serves as a single source for storing, retrieving, editing/updating, analyzing, and displaying project related information. It provides the ability to create comprehensive environmental resource maps used to first avoid and then minimize impacts as part of the definition of initial alternatives, to the extent practical. The GIS database streamlines the capabilities, quality, and consistency with respect to preparing impact and performance reports in table format for comparative analysis.

Table 1-1 provides a summary by resource topic of the primary data sources used during the Tier One studies and those that are being used during the Tier Two studies. In addition, key elements of the Tier Two study methodology are presented for each resource.

Table 1-1. Primary Data Sources and Methodologies

Resource Topic	Tier One Data Sources	Tier Two Data Sources	Tier Two Methodology
Socioeconomic	• GIS database • US Census • Existing planning documents • Windshield survey	• GIS database • US Census • Field surveys • Stakeholder meetings	• Conceptual stage relocation studies • Census block level population analysis • Use of economic modeling tools (PRISM™) • Prepare Community Impact Assessment • Environmental Justice Evaluation
Agricultural	• GIS database	• GIS database • Stakeholder meetings	• Complete Form AD 1006 and Form NRCS-CPA-106 • Assess impacts to agricultural land, farm fields and operations, and conservation program lands • Coordinate with local farm bureaus, Departments of Agriculture and NRCS • Farm Severances • Uneconomical Remnants • Prime Farmland Assessment • Prepare Agricultural Technical Memorandum

Resource Topic	Tier One Data Sources	Tier Two Data Sources	Tier Two Methodology
Cultural Resources	• GIS database • Records search • National, state, and local historic and cultural resource lists, reports and maps • Programmatic Agreement	• Records and literature search • Field surveys and photo documentation of historic structures • Deep testing for archaeological resources • National, state, and local historic and cultural resource lists, reports and maps • Property owner interviews • Agency consultation	• Follow Section 106 process preparing determinations of eligibility and effects assessments • Develop a Memorandum of Agreement (MOA) or Programmatic Agreement for handling adverse effects • Prepare Historic Properties Technical Report and Archaeological Resources Investigation Technical Report • Concurrent Section 4(f) for historic properties
Air Quality	• Existing RTP/TIP/SIP information • EPA data	• RTP/TIP/SIP information • EPA data • Traffic data • MOVES inputs from MPOs • Meteorological data • Construction information	• Conduct mesoscale analysis for impacts to regional air quality levels • Conduct microscale analysis to assess possible National Ambient Air Quality Standards (NAAQs) violations • Conduct quantitative Hot Spot Analysis for $PM_{2.5}$ • Prepare an Air Quality Technical Report
Noise	• GIS database	• Traffic data (peak hour traffic volumes) • Engineering plan and profile CADD files • Noise receptor modeling • Field noise measurement data • GIS database	• Screening of sensitive land uses • Model traffic noise at select receptors • Assess existing and proposed noise levels at Midewin • Use feasible and reasonable criteria for abatement evaluation • Prepare Noise Monitoring Plan and Noise Receptor Selection Memorandum • Prepare Traffic Noise Technical Report
Energy		• Traffic data	• Calculate direct energy consumption with EPA MOVES2010 model • Analyze indirect energy consumption using cost estimates and construction energy factors

Resource Topic	Tier One Data Sources	Tier Two Data Sources	Tier Two Methodology
Natural Resources	• GIS database	• GIS database • Field surveys • Existing studies	• Finalize surveys of T&E Species • Determine potential impacts to T&E species • Assess wildlife and habitat impacts • Assess impacts to neo-tropical and grassland birds • Develop mitigation for impacts to wildlife, habitat, and protected species • Assess impacts to land cover and trees • Coordinate with Midewin
Water Resources	• GIS database	• GIS database • Field surveys and delineations • Water quality sampling	• Perform waters of the U.S. delineations • Complete fish, mussel, and aquatic macro-invertebrate surveys, water quality sampling, and habitat assessments • Perform pollutant loading analysis • Assess potential impacts to water resources • Identify Best Management Practices (BMPs) to minimize impacts to water resources • Prepare Water Resource Technical Report(s)
Groundwater Resources	• GIS database	• GIS database	• Identify and document groundwater resources • Potable wells assessment
Floodplains	• GIS database	• GIS database • Field survey and agency databases	• Identify and evaluate existing and proposed floodplain encroachments
Wetlands	• GIS database	• GIS database • Field surveys and delineations	• Complete formal delineations • Assess project impacts to all wetlands • Identify High Quality sites and assess impacts • Assess avoidance and minimization potential • Develop overall mitigation strategy, differing across state lines. • Wetland Technical Report

Resource Topic	Tier One Data Sources	Tier Two Data Sources	Tier Two Methodology
Special/Hazardous Waste	• Regulatory agency databases • GIS database	• Regulatory agency databases • GIS database • Field surveys	• Phase I (PESA) study identifying recognized environmental conditions (RECs) (IL) • Prepare ISA Parcel Selection Technical Report and ISA Technical Report for Indiana portion of the corridor
Section 4(f)	• GIS database • Agency consultation	• GIS database • Agency consultation • Field surveys	• Conduct formal Section 4(f) consultation with officials with jurisdiction • Conduct Section 4(f) evaluation process for any Section 4(f) property involvement • Prepare Section 4(f) Evaluation
Special Lands	• GIS database	• GIS database • Agency consultation • Field surveys	• Identify Special Lands (Nature Preserves, etc.) and assess impacts
Mineral Resources	• GIS database	• GIS database	• Perform geologic condition investigations • Quantify impacts to aggregate resource needs
Visual Resources	• Windshield survey	• Preliminary engineering design • Field surveys	• Assess visual impacts using FHWA guidance
Indirect and Cumulative	• GIS database • Population and employment forecasts • Existing planning documents	• GIS database • Population and employment forecasts • Existing planning documents • Stakeholder interviews	• Land use decision-maker interviews • Analysis of market demand and local zoning ordinances • Coordinate with other resource disciplines for impact estimates • Assess indirect effects on wildlife and potential effect of fugitive light on Calumet Observatory

Completion of the Tier Two environmental resource data collection and field surveys is an ongoing effort. New information that becomes available will be added to the Tier Two GIS database as part of the Tier Two Draft EIS process.

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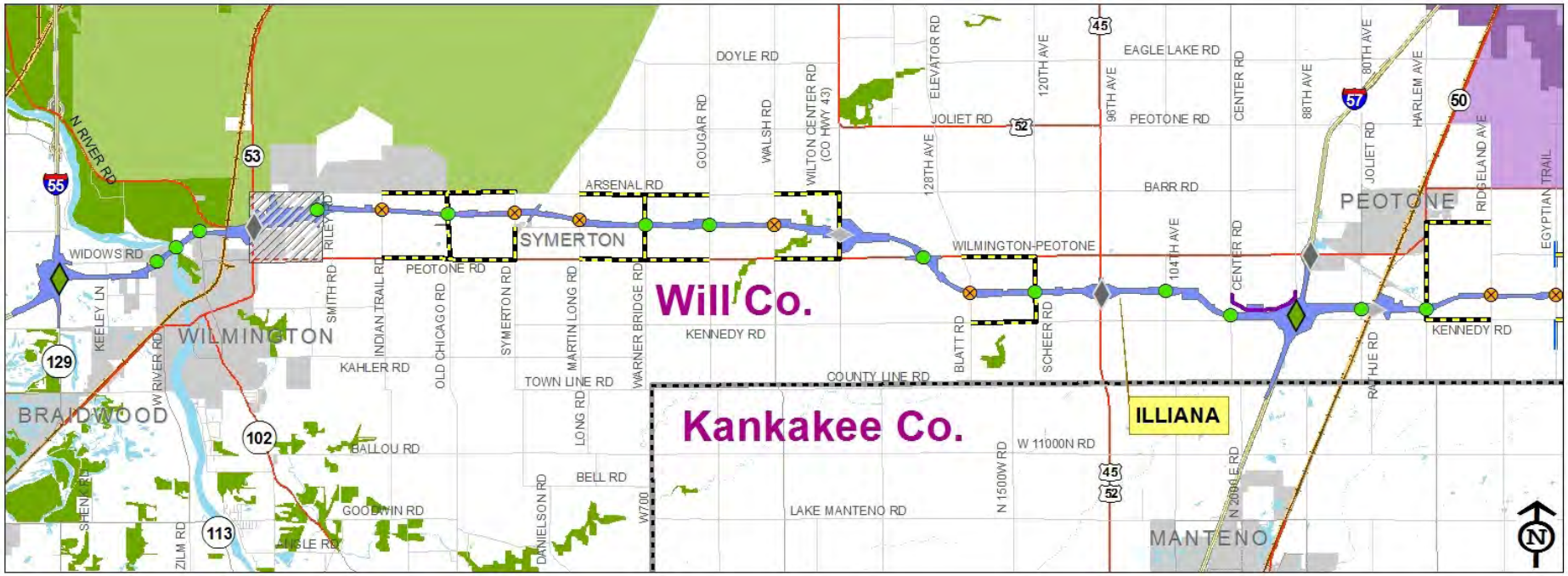
Figure 4-1. Preliminary Road Closures



Draft Road Connectivity Proposal

Legend

- Open
- Under Consideration for Closure*
- Interstate Interchange
- Interchange
- Potential Interchange ^
- Route if Road is Closed
- Proposed Frontage Road
- A local access interchange to IL 53 is being considered at locations within this area, from IL 53 to Riley Road.
- Freeways
- Highways
- Arterials
- Streets
- Local Road
- Railroad
- South Suburban Airport (Inaugural)
- South Suburban Airport (Ultimate)
- Midewin National Tallgrass Prairie
- Natural Areas
- River, Stream and Lake
- County Line
- Map Match Line

0 2.5 5
Miles

* Crossroad connectivity is currently under evaluation and is subject to change through the Tier 2 process.

^ Potential local access interchange locations were added following the conclusion of Tier One studies. These locations are warranted to be kept open with a grade separation regardless of whether an interchange is built.

Figure 4-2. Preliminary Road Closures

Draft Road Connectivity Proposal

0 2.5 5
Miles

Legend

- Open
- Under Consideration for Closure*
- Interstate Interchange
- Interchange
- Potential Interchange ^
- Route if Road is Closed
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- Natural Areas
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- County Line
- Map Match Line

* Crossroad connectivity is currently under evaluation and is subject to change through the Tier 2 process.

Date: 5/17/2013

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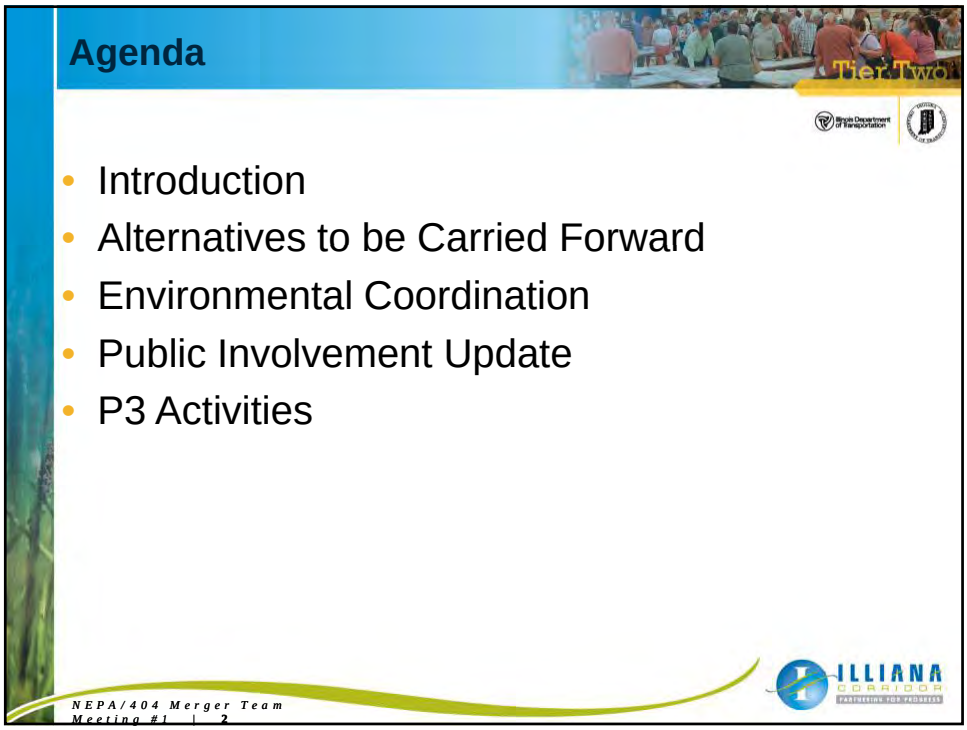
Illiana Corridor
NEPA/404 Merger Team
Meeting
May 22nd 2013
Tier Two
Illinois Department of Transportation


Agenda
Tier Two
Introduction
Alternatives to be Carried Forward
Environmental Coordination
Public Involvement Update
P3 Activities
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NEPA/404 Merger Team
Meeting #1 | 2

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Introductions
Tier Two
Illinois Department of Transportation

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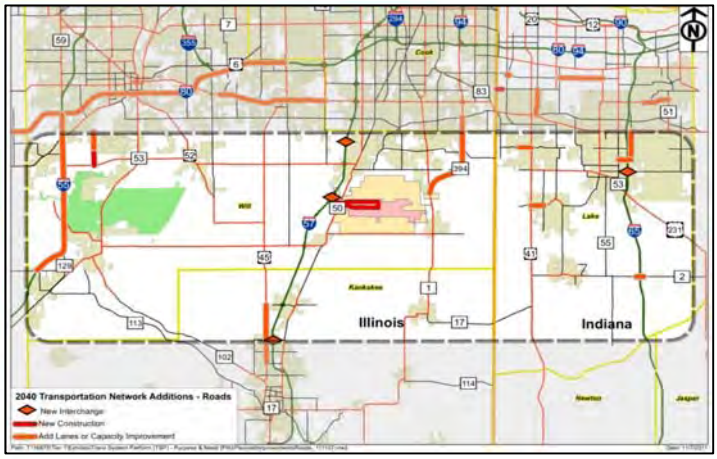
Alternatives To be Carried Forward
Tier Two
Illinois Department of Transportation

No-Action Alternative



Committed Projects In or Near the Study Area

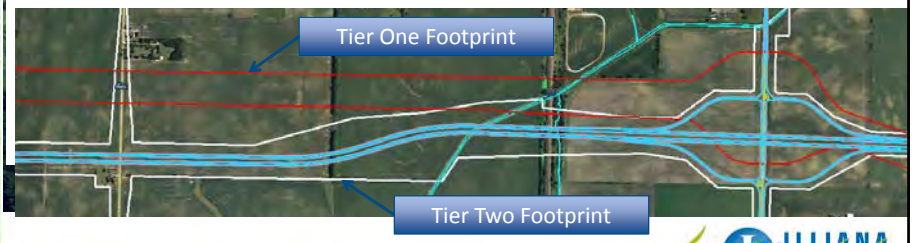
Route	Description	Location
Will County, Illinois		
I-80	Add lanes	From US 45 in Frankfort to US 30 in New Lenox (C)
I-80	Add lanes	From US 30 in New Lenox to Ridge Road in Minooka (I)
US 30	Add Lanes	From IL-43 in Frankfort to Williams St. in New Lenox (M)
IL-394	Upgrade to Limited Access	From IL-1 in Crete to Sauk Trail in Sauk Village (I)
I-57	New Interchange	At Stuenkel Road in University Park (M)
I-57	New Interchange and Connector Road	At SSA in Monee (I)
Baseline Road	New Road	From Arsenal Rd. to Schweitzer Road in Elwood (I)
I-55	Add Lanes	From IL-113 to I-80 (I)
Kankakee County, Illinois		
I-57	New Interchange at 6000 N Road	Bourbonnais (M)
US 45/52	Add Lanes	From Kathy Drive in Bourbonnais to Manteno Road in Manteno (I)
Lake County, Indiana		
I-65	New Interchange	109th Avenue in Crown Point (M). This project has been completed.
Mississippi Street	New Road	from US 30 to 61st Ave. in Merrillville (N)
101st Avenue	Add Lanes	Merrillville (N)
SR 2	Add lanes, interchange improvement	I-65 east of Lowell (N)
Kennedy Avenue	Add Lanes	Schererville (N)

Source: (C) CMAP; (I) Interview with state, county, and local transportation officials; (N) NIRPC; (M) Inclusion in state multi-year construction program or recent construction.

B3 Environmental Footprint

Tier Two

- Tier One footprint
  - Best Available GIS Data for avoidance and impact evaluation
  - Standardized 400' Wide corridor with conceptual interchange Layouts
  - Side Roads not included in footprints
- Tier Two Footprint
  - Utilize Environmental Field Survey for avoidance and impact evaluation
  - Includes Design Footprints for Interchanges and Side Roads
  - Includes Design Footprints for Mainline
  - Includes application of detention/treatment opportunity areas
  - Includes access roads to land locked parcels



NEPA/404 Merger Team Meeting #1 | 7

Working Alignment Measures Potential Impacts

Tier Two

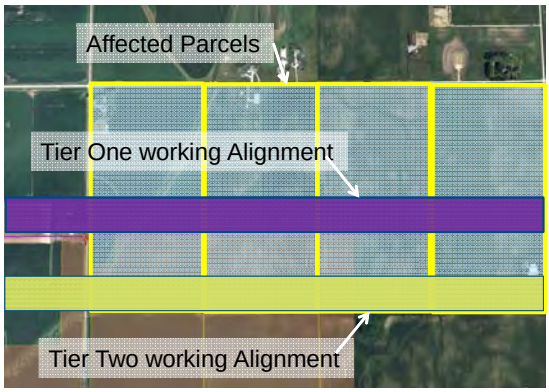
- **Alignment location will move**
- **Actual alignment will be finalized fall 2013**

NEPA/404 Merger Team Meeting #1 | 8

Refined Working Alignment

Tier Two

Concept Revisions Reduce Farm Severances



- A 300 acre reduction in severances was possible by shifting the alignment 800' south for ten 80 acre parcels
- Over 25 large parcels have significant reductions in severance due to alignment adjustments

Primary Data Sources and Methodologies

Tier Two

Resource Topic	Tier One Data Sources	Tier Two Data Sources	Tier Two Methodology
Natural Resources	• GIS database	• GIS database • Field surveys • Existing studies	• Finalize surveys of T&E Species • Determine potential impacts to T&E species • Assess wildlife and habitat impacts • Assess impacts to neo-tropical and grassland birds • Develop mitigation for impacts to wildlife, habitat, and protected species • Assess impacts to land cover and trees • Coordinate with Midewin
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A table of the resources is included in the handout package

Interchange Analysis

Tier Two

- Initially locate at state highways
- State highways generally offer compatible traffic function and land use for interchanges
- State highways are necessary truck route connections
- 2 new interchanges considered in Tier two
  - CH 43 / Wilton Center Road
  - IL-50
- New interchanges may be deferred to future when demand or land use develops
- Alternatives Evaluated based on
  - Impact evaluation
  - Safety
  - Traffic Operations
  - Stakeholder Input
  - Constructability

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NEPA/404 Merger Team Meeting #1 | 11

Design Options at Interchanges

Tier Two

- Interchange Under Consideration
  - I-55 @ Lorenzo Road Service Interchange
  - I-55 Full system Interchange with local access to IL-129
  - IL-53 (Multiple options under consideration)
    - No Interchange
    - Offset interchange (two concepts)
    - Interchange on IL-53
  - County Highway 43 (New Interchange through stakeholder input)
    - Emergency Access
    - Full Interchange (recommended option)
  - RTE-45 Diamond interchange
  - I-57 Full System Interchange
  - IL-50
    - No Interchange
    - Modified Parclo Interchange
  - IL-1 (Dixie Hwy) Diamond interchange
  - US-41
  - IN-55 Tight Diamond
  - I-65 Full System Interchange

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NEPA/404 Merger Team Meeting #1 | 12

Corridor Fly Through

Tier Two

Local Road Connectivity

Tier Two

- ***Economic Considerations***
- ***Emergency and School Routes***
- ***Landowner Access***
- ***Future Land Use***
- ***Stakeholder Involvement***
  - Local Officials
  - Emergency Services
  - School Districts
  - Farm Operations
  - Local Road Agencies
  - Others

Road Connectivity

Tier Two

Draft Road Connectivity Proposal

Legend

- Open
- Under Consideration for Closure*
- Interstate Interchange
- Interchange
- Potential Interchange *
- Route if Road is Closed
- Proposed Frontage Road
- A local access interchange to IL 53 is being considered at locations within this area, from IL 53 to Riley Road.
- Freeways
- Highways
- Arterials
- Streets
- Local Road
- Railroad
- South Suburban Airport (Inaugural)
- South Suburban Airport (Ultimate)
- Midewin National Tallgrass Prairie
- Natural Areas
- River, Stream and Lake
- County Line
- Map Match Line

0 2.5 5 Miles

* Crossroad connectivity is currently under evaluation and is subject to change through the Tier 2 process.

* Potential local access interchange locations were added following the conclusion of Tier One studies. These locations are warranted to be kept open with a grade separation regardless of whether an interchange is built.

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NEPA/404 Merger Team Meeting #1 | 15

Road Connectivity

Tier Two

Draft Road Connectivity Proposal

Legend

- Interstate Interchange
- Interchange
- Route if Road is Closed
- Proposed Frontage Road
- Freeways
- Highways
- Arterials
- Streets
- Local Road
- Railroad
- South Suburban Airport (Inaugural)
- South Suburban Airport (Ultimate)
- Natural Areas
- River, Stream and Lake
- County Line
- Map Match Line

0 2.5 5 Miles

* Crossroad connectivity is currently under evaluation and is subject to change through the Tier 2 process.

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Tolling and Non Tolling

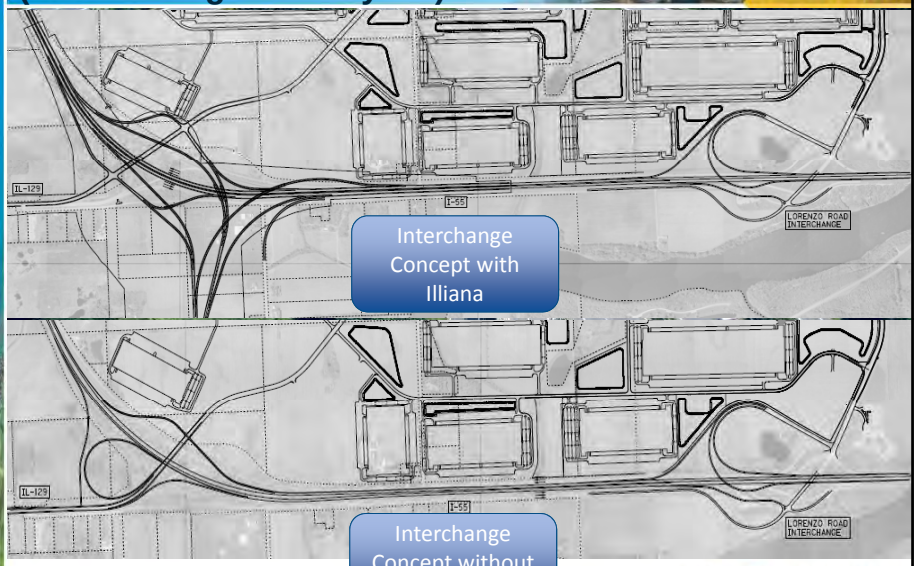
Tier Two

Single Tolled Scenario is recommended for impact and travel performance analysis

The DEIS will evaluate the travel performance and impacts based on a single tolled traffic retention analysis. Sensitivity analysis will be performed on the effects of tolling rates on traffic volumes.

Lorenzo Road (I-55 Wilmington Study EA)

Tier Two



Biological Assessment

Tier Two

- Sheepnose mussel (federally endangered) confirmed near Kankakee River crossing
- Section 7 Consultation initiated (May 13, 2013)
- Biological Assessment to include all listed federal species
- BA will include results of 2013 field surveys for Indiana Bat and EPFO
- Single BA (for both states) preferred

2013 Field Studies

Tier Two

- Indiana Bat: 5 sites in Illinois/1 site in Indiana
- Eastern Prairie Fringed Orchid: 14 wetlands with FQA >20 (IL)
- Griesel Ditch and Bryant Ditch (IN) scheduled for aquatic resource surveys (dry in 2012)
- Summer Aquatic Macro-Invertebrate sampling in Indiana
- Fish and Mussel "spot checks" in Indiana, as necessary
- Spring Water Quality sampling in Indiana
- Sample plot tree study (Indiana riparian corridors)

Section 106 – Above-ground Resources

Tier Two

- Preliminary Determinations of Eligibility (IL)
  - IDOT-BDE completed preliminary determinations
  - 28 formal National Register of Historic Places (NRHP) determinations of eligibility to be completed for submittal to SHPO and Consulting Parties
- Historic Property Report (IN)
  - One (1) property recommended to be eligible for listing in the NRHP
  - Document to be posted to Project Website
  - Distributed to SHPO and Consulting Parties
- Alternate Route 66 webinar, May 29
- Eligibility and effects in DEIS (tentative)
- MOA likely at FEIS/ROD

Section 106 – Below-ground Resources

Tier Two

- Determinations of Eligibility – IL
  - No recorded sites determined NRHP eligible
  - No known prehistoric or historic period burial sites
  - At this stage, 36 sites warrant further investigation to evaluate NRHP eligibility
- Determinations of Eligibility – IN
  - Completed reconnaissance level survey
  - One area requires further investigation to evaluate NRHP eligibility
- Continued evaluation through DEIS and FEIS/ROD
- MOA likely at FEIS/ROD

Wetlands Field Review

Tier Two

- Tentative dates:
  - Illinois – June 17-20 and June 24-26
  - Indiana – TBD
- Wetland sites of interest to be identified
- Landowner notice protocols

BMP Opportunity Area Treatment Types

Tier Two

Legend

Water Quality Best Management Practices (BMP)

- 1 BMP Swale-Basin
- 2 BMP Swale
- 3 BMP Infiltration

Wetland/Riparian Buffer

- 4 Riparian Buffer WQ BMP
- 5 Wetland Water Quality (WQ) BMP

Prairie or Forest Restoration/Enhancement

- 7 Forest Restoration or Enhancement
- 8 Prairie WQ BMP
- 9 Prairie Restoration
- Wildlife Crossing
- Edge of Pavement
- Right-of-Way

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BMP Opportunity Areas

Tier Two

- Cedar Creek, IN

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BMP Opportunity Areas

- Forked Creek, IL

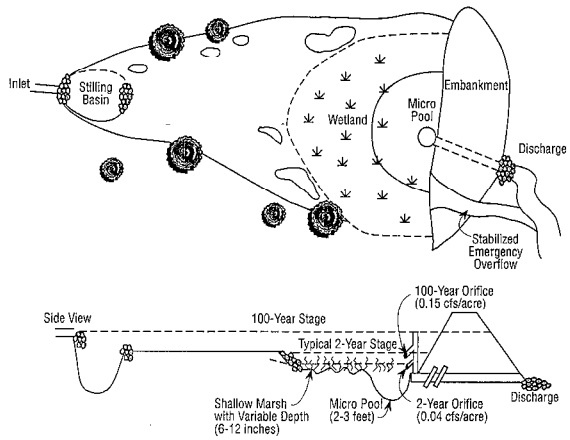
Illiana BMPs

Naturalized Stormwater Management Facilities

University Research Park
Madison, Wisconsin

Best Management Practices

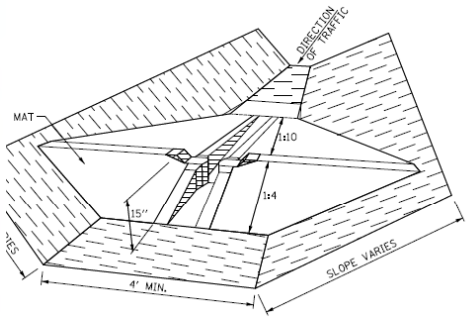
Typical Water Quality Wetland/Detention Pond

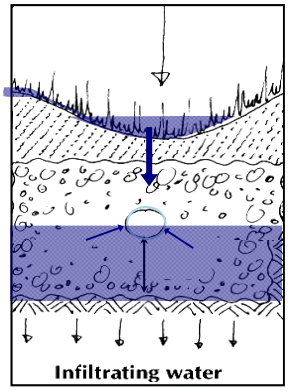


5.4 Detention Basins
Page 21

Bioswales

- Bioswales can be installed within swale and ditch lines to promote filtration and nutrient uptake.

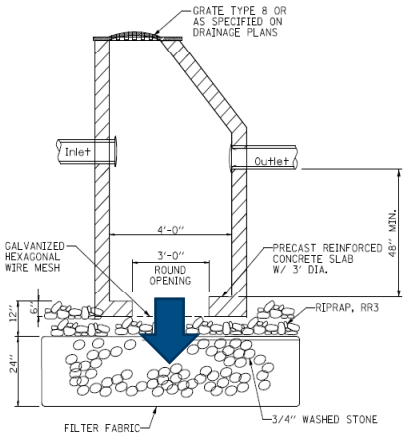




Infiltration Catch Basins

Tier Two

- Manholes are designed with leaky bottoms to promote infiltration



INFILTRATION CATCH BASIN DETAIL

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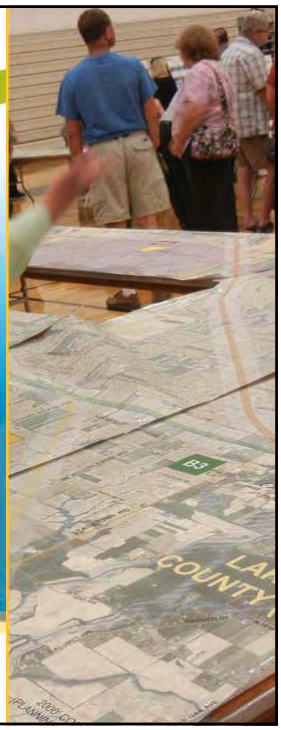
Public Involvement Update

Tier Two



Tier Two Stakeholder Outreach

January - April

- 45 one-on-one stakeholder meetings (local governments, schools, EMS)
- CMAP and NIRPC staff technical coordination meetings

February

- 5 landowner meetings (approximately 850 attendees involving over 400 landowners)
- CMAP Tier II consultation meeting, February 14th

Tier Two Stakeholder Outreach

March

- Tier Two Corridor Planning Group #1 meeting, March 14th
- 2 CSS workshops: Midewin-Wilmington, March 13th; IL-53 Corridor Planning Group, March 20th

April

- Land Use Task Force #1 meeting, April 10th
- Tier Two Public meetings: April 16th – Peotone, IL; April 18th – Cedar Lake, IN
- NIRPC Committees and Commission meetings: April 9th, 11th, and 18th

Tier Two Stakeholder Outreach

April (continued)

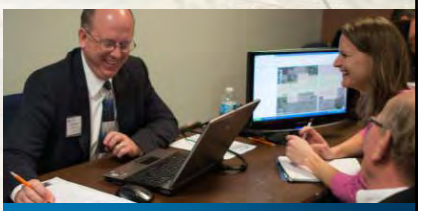
- Kankakee Co. Land Use/Transportation Task Force, April 18th
- Land Use Task Force #2 meeting, April 30th
- Tier Two Corridor Planning Group #2 meeting, April 30th

May

- Land Use Task Force #2 meeting, April 10th
- One on One Stakeholder Meetings – 31 scheduled
- Will County Historic Preservation Committee, May 1st
- MPO coordination - CMAP, NIRPC

Landowner Meeting: What Did We Hear?

- Opinions on road closures
- Access impacts
- Impacts if partial property is acquired
- Locations of field tiles, well and septic
- Information on wetlands and flow of water
- Noise and visual impacts
- Land acquisition process



- ✓ *Happy we involved them in the process and asked their opinions*
- ✓ *Sincere in the approach to the meetings*

One-on-One Stakeholder Meetings

What did we hear?

- Location of interchanges
- Keeping roads open in certain areas
- Swapping "road kept open" locations
- Adding locations of roads kept open
- Frontage roads or relocated roads

Second round – May 2013

- Gather info on I & C Impacts
- Further local issues coordination

Next Steps in Public Involvement

Public Meeting #2

- *June 17- Lowell Middle School*
- *June 18 – Peotone High School*

P3 Industry Forum

- *June 24-25, Rosemont*

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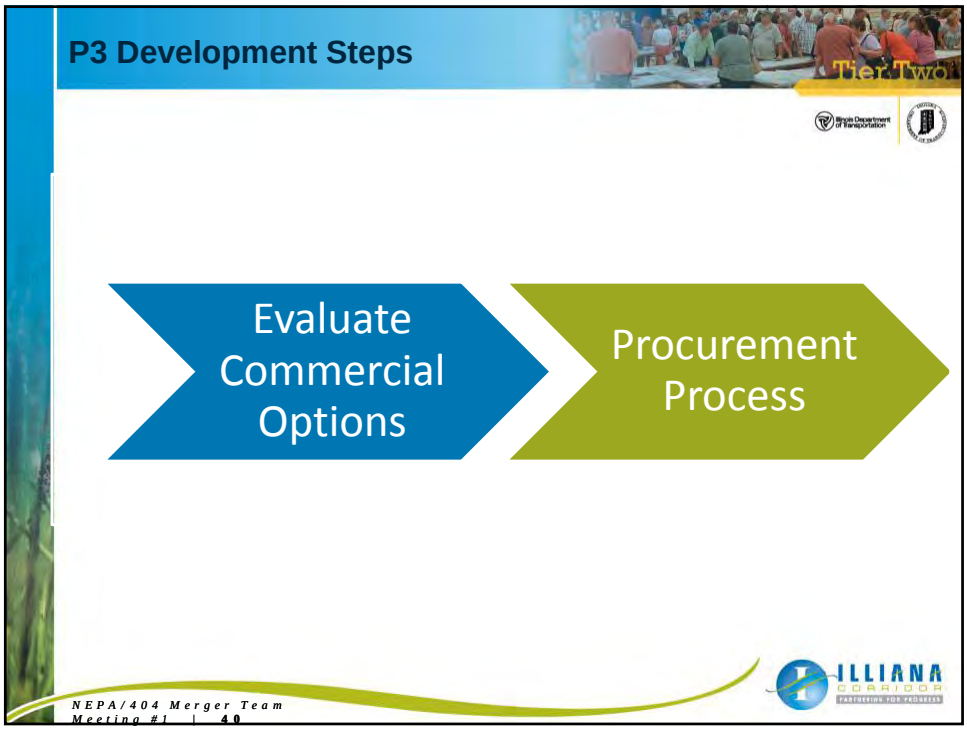
P3 Activities
Tier Two
Illinois Department of Transportation


P3 Development Steps
Tier Two
Evaluate Commercial Options
Procurement Process
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NEPA/404 Merger Team Meeting #1 | 40

Overall Illiana Corridor Schedule

Tier Two

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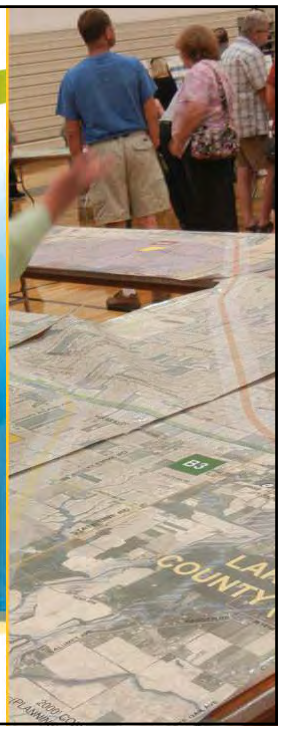
Next Steps

Tier Two

Illinois Department of Transportation



Alternatives to Carry Forward Outreach

Tier Two

- Small Group Stakeholder Meetings- May/June 2013
- CPG Meeting #3- May 30, 2013
- Transmit Alternatives to Carry Forward Concurrence Package- June 10, 2013
- Public Meetings- June 17th and 18th
- P3 Industry Forum – June 24th and 25th
- Requesting Concurrence July 10th, 2013

Illiana Corridor
Phase II Study

Merger Team Meeting Summary

Date: May 22, 2013
Time: 10:00 AM – 12:00 PM CDT
Location: Conference Call

This meeting was held as a monthly update to the Merger Team of the Illiana Corridor Tier Two environmental study. The attendees are as shown below (no attendance sign-in since meeting was by conference call only).

D. McGibbon provided an overview of the alignment studies underway for Corridor B3. Highlights included a recent decision to merge the Lorenzo Road project with the Illiana Corridor, continued evaluation of interchange options at IL-53, and an overpass to be provided for the Wauponsee Glacial Trail as the Illiana Corridor will remain at grade, and that a wider structure is planned across West Creek to accommodate space for a proposed trail by the Lake County Parks Department. Space for detention areas will also be shown. An interchange at SR 55 is being further evaluated. It was also confirmed that tolled traffic volumes will be used in the Tier Two DEIS.

S. Ott reviewed the environmental studies underway, including a Biological Assessment (BA) for the sheepnose mussel, confirmed by the Illinois Natural History Survey (INHS) in the Kankakee River upstream of the proposed crossing by Corridor B3. S. Cirton confirmed that a single BA would be acceptable for submittal to the U.S. Fish and Wildlife Service. V. Ruiz stated that no 2013 mussel surveys are planned since presence has been assumed. S. Hall indicated that a 2013 survey is needed in the amended Environmental Survey Area for the Eastern prairie fringed orchid and should be completed within the June 28th survey window. T. Brooks stated 14 survey locations have been identified, in addition to other eligible botanical areas; Cathy Pollack (INHS) will be coordinating the field activities.

S. Ott summarized the status of historic and archaeological investigations, historic property documentation and the upcoming webinar with the Historic Route 66 Consulting Parties, consistent with Section 106 of the National Historic Preservation Act. S. Hall commented on Table 1-1 of the Scoping Document, indicating that the Native American Tribes should be consulted for possible historic and archaeological site information. S. Ott concurred and the table will be revised accordingly.

Plans for the upcoming wetland field studies were discussed including advance notice to the landowners prior to entry onto private property. S. Hall confirmed that two days are being planned for the Illinois section review. J. Randolph indicated a preference for the first two weeks of June. M. Fuller stated that he will send out a 'when-is-good' request to confirm the best dates for the participants.

J. Anderson reviewed the overall approach for, and key elements of the Best Management Practices (BMP) opportunity areas now being identified within the proposed project footprint. L. Pelloso supported the concepts presented, and it was clarified that the first 0.75-inch of a storm event will be detained which contains approximated 88 percent of the solids. Considerations for wildlife crossings are also

being made part of the BMP concepts which both S. Cirton and M. Buffington expressed as a key component of the BMP concept plan. J. Randolph commented that the BMPs would not be considered part of the mitigation commitments required in conjunction with the required state and federal permits. K. Westlake inquired about the use of right-of-way fencing to direct wildlife movement to such crossing locations.

R. Powell reviewed the status of the design studies underway. There are interchange design options at IL 53 and Wilton Center Road. An Alternatives to be Carried Forward Technical Memorandum is currently being prepared and will be distributed to the resource agencies in advance of the June 12 NEPA meeting, tentatively set for the purpose of requesting concurrence on alternatives to be carried into the Tier Two DEIS. The road connectivity analysis is ongoing, and the current road closure list is being revised to include additional roads open in Indiana. R. Powell clarified for S. Hall that the tolled scenario being carried forward will retain approximately 40 percent of the traffic of a non-tolled scenario, and that a non-tolled build scenario will not be carried forward. E. Leonard updated the participants on the status of public private partnership (P3) activities, including the upcoming P3 forum in late June sponsored by leadership of both states.

The meeting concluded at approximately 12:10 PM.

Attendees (all remote):

Matt Fuller, Joyce Newland – FHWA Indiana
Soren Hall – U.S. Army Corps of Engineers
Shawn Cirton, U.S. Fish and Wildlife Service
Norm West, Liz Pelloso, U.S. Environmental Protection Agency
Jason Randolph, Indiana Department of Environmental Management
Matt Buffington, Indiana Department of Natural Resources
Anne Haaker, Indiana State Historic Preservation Office
Tom Brooks, Sue Hargrove, Walt Zyznieuski, Illinois Department of Transportation, Bureau of Design and Environment
Steve Schilke, Vanessa Ruiz, Illinois Department of Transportation
Jim Earl – INDOT
Jedd Anderson, Pete Knysz – Christopher B. Burke Engineering, Ltd.
Ed Leonard, Rick Powell, Rick Rampone, Dave McGibbon, Steve Ott – PB

DRAFT

Coordination Meeting with US Fish & Wildlife Service
DEIS Comment Responses
July 17, 2012: Directly Following the Section 7 Consultation Meeting
Conference Call-in Number: 877-829-8910; access ID 7799072#

Attendees

Matt Fuller – FHWA Illinois
Joyce Newland – FHWA Indiana
Louise Clemency – USFWS – Illinois
Elizabeth McCloskey – USFWS – Indiana
Steve Schilke – IDOT
Kesti Susinskas – IDOT
Sam Mead – IDOT
Vanessa Ruiz – IDOT
Greg Kicinski – INDOT
Laura Hilden – INDOT
Steve Ott – PB
Rob Malone – PB
Jim Novak – Huff & Huff
Greg Quartucci – JF New
Pete Knysz – CB Burke

Items for Discussion

1. DEIS Comment Responses (Key USFWS Comment Issues)

Subsection 3.6 – Noise

- **Comment:** In addition to discussing impacts on humans, noise impacts and their effects on wildlife should be considered and discussed in this subsection or Subsection 3.8.2 of the Tier One Final EIS.
- **Response:** The design detail at the Tier One level do not have the detail to complete a technical traffic noise report, that would address both noise impacts and proposed noise mitigation, as required by FHWA, IDOT and INDOT's Traffic noise policies. These policies only address noise impacts to existing or planned areas with frequent human use and do not require traffic noise studies be completed for wildlife areas.

We have reviewed some of the documentation to investigate the potential for noise impacts to wildlife, in particular, birds. Forman (2002) indicates for multi-lane highways with ATD greater than 30,000 vehicles per day bird presence and breeding were reduced for 1,200 meters from the road. The working alignments within Corridor B3 range from approximately 350 to 950 meters from known avian breeding areas within the southwest and southeast portions of the Midewin National Tallgrass Prairie. Bird presence and breeding for several hundred meters within the Midewin National Tallgrass Prairie may be reduced by Corridor B3. Based on the 1,200 meter distance, reduced bird presence and breeding area within Midewin National Tallgrass Prairie would encompass between approximately 380 to 590 acres.

"As restoration on Midewin proceeds, the amount of cropland and successional vegetation will decline and be replaced by restored native vegetation, but at least 6,700 acres of agricultural grasslands will be maintained to support populations of area-sensitive grassland birds." (MNTP 2008 Land and Resource Management Plan (Prairie Plan) Amendment EA). The reduced bird presence and breeding area within Midewin National Tallgrass from Corridor B3 would account for approximately 6 to 9 percent of the total grassland habitat within Midewin for grassland bird species. Studies completed for Tier Two will identify bird species and potential direct and indirect effects to grassland bird species. Tier Two will identify avoidance and minimization measures and mitigation strategies if required. We have reviewed some of the documentation to investigate the potential for noise impacts to wildlife, in particular, birds. Studies completed for Tier Two will identify bird species and potential direct and indirect effects to grassland bird species.

Subsection 3.8 – Natural Resources

3.8.1 – Upland Communities

- **Comment:** This subsection should identify Midewin National Tallgrass Prairie (MNTP) as an Important Bird Area (IBA), as recognized by the National Audubon Society (Audubon).
- **Response**: Comment noted and changes have been made to the Final EIS.

3.8.2 – Wildlife Resources

- **Comment:** Breeding bird survey data likely under represents the diversity of migratory birds within the corridor area.
- **Response**: Comment noted. Additional information will be added to the Final EIS to indicate the importance of MNTP for local bird populations. We appreciate the additional information that was provided. In addition, detailed biological surveys will be completed in Tier Two, including avian censuses. Coordination with Midewin will be on-going and additional data will be obtained as necessary.

- **Comment:** Additional birds that are listed due to their rare or declining status in MNTP grassland bird management areas should be included in the document.
- **Response:** Additional bird information will be added to the Tier One document as appropriate.

- **Comment:** Wetland, shrubland, savanna, and woodland birds found near the southern boundary of MNTP, with some of these areas receiving funding from USFWS should be listed in the document.

- **Response:** Additional bird information will be added to the Tier One document as appropriate.

- **Comment:** Site specific information on grassland birds at JTA. Information about birds on the RCP and BCC lists should also be incorporated into the Tier One Final EIS.
- **Response:** More site specific information on birds will be obtained through the detailed biological surveys that will be completed for Tier Two. Additional bird information will be added to the Tier One document as appropriate.

- **Comment:** Studies have shown that the number of breeding woodland and grassland birds have declined significantly near roads as a result of noise. Rare and declining bird species found at MNTP and JTA that would be subject to increased vehicular noise may not be able to habituate to the increased disturbance levels because they are not native generalists, non-native colonizers, or urban species.
- **Response:** Comment noted. The project team would welcome the opportunity to work with your agency on an impact assessment to various bird species and to investigate potential mitigation measures that can be implemented to minimize or eliminated impacts. We anticipated that this coordination will begin shortly and that more information on birds will be obtained during Tier Two studies. During Tier Two, final alignments will be identified and appropriate mitigation measures that consider the roadway and its surrounding environment can be identified and developed.

- **Comment:** National Environmental Policy Act (NEPA) review of other transportation projects has resulted in identification of noise impacts to migratory birds and in substantial commitments to mitigate for those impacts through restoration of additional habitats.
- **Response:** Additional information will be added to the FEIS as appropriate.

- **Comment**: The Tier One Draft EIS fails to mention the adverse impacts of lighting from the proposed expressway on natural resources at JTA or MNTP. Artificial lighting from the expressway could disrupt the normal activities of insects which would be attracted to the increased amount of lighting. Of note are populations of the federally threatened eastern prairie fringed orchid (Platanthera leucophaea) located at MNTP. The orchid is primarily pollinated by hawk moths (Lepidoptera – Sphingidae). These moths could be attracted to bright lights, thereby reducing pollination opportunities for the orchid. In addition, the moths could be subject to increased predation, at dusk and at night, by bats and birds. In addition, artificial lighting could adversely affect other species in the area including bats.
- **Response:** Your comments on the potential effects of stray lighting on hawk moths' pollination of populations of the eastern prairie fringed orchid are acknowledged. The Tier One Final EIS includes discussion of this issue. During Tier Two studies, lighting impacts affecting the hawk moth in the direct vicinity of populations or habitat of the eastern prairie fringed orchid will be addressed, and lighting spectra, directionality, and intensity will be implemented that is minimally intrusive to the hawk moth while still meeting roadway lighting safety criteria.

- **Comment:** To mitigate for lighting impacts, the DOTs should consider the following measures. External lighting should be directed inward and limited to the minimum intensity necessary to provide night visibility. The DOTs should minimize stray light and consider lights that are less attractive to insects (lights with spectrum frequencies more toward the yellow-red end of the spectrum than the blue). The DOTs should also use International Dark-Sky Association approved

lighting for all external lights to reduce effects on crepuscular and nocturnal species. Lighting impacts should be discussed in the Tier One Final EIS.

- **Response:** The DOTs will work with your agency in developing a lighting plan that considers the natural environment, while not compromising motorist safety.

3.8.3 – Threatened and Endangered Species

- **Comment:** The Draft EIS notes that surveys for the Indiana bat (Myotis sodalis) will be conducted and presented in the Tier Two NEPA studies. During a meeting on August 14, 2012, IDOT staff noted that surveys would be conducted in Illinois and Indiana. The USFWS will work with IDOT to select appropriate mist netting sites. Mist netting surveys should also note the presence of the northern long-eared bat (Myotis septentrionalis). Other bat species USFWS is studying should be included in the document.
- **Response:** Detailed surveys for bats have been initiated in the corridor as part of the Tier Two study. This information will be included in the Tier Two EIS.

Subsection 3.9 – Water Resources and Aquatic Habitats

- **Comment:** USFWS recommends that the FEIS note that detention ponds do little to control stormwater runoff volumes.
- **Response:** The text in the FEIS has been revised, as requested.

- **Comment:** USFWS recommends that the FEIS indicate that infiltration BMPs should be constructed to offset additional stormwater runoff from new impervious surfaces.
- **Response:** The DEIS includes discussion on infiltration BMPs. Additional text regarding the construction of infiltration BMPs to offset additional stormwater runoff has been added to the FEIS.

- **Comment:** USFWS recommends that additional discussion on potential water quantity impacts and mitigation measures be provided.
- **Response:** Additional discussion on potential water quantity impacts and mitigation has been added to the FEIS.

- **Subsection 3.12 – Wetlands**

3.12.1 – Existing Conditions

- **Comment:** Figure 3-35, which shows the locations of wetlands and Waters of the United States, is too small, even with the enlarged insets, to adequately show the locations of wetlands relative to the proposed highway corridors. Each inset should individually be a page with a topographic map so that the actual locations of wetlands on the ground can be determined and streets and railroads are identified.
- **Response:** Additional exhibits with more detail will be added to the appendix to illustrate the wetland resources more clearly.

Subsection 3.14 – Section 4(f) Properties/Parks and Recreation

3.14.2 – Description of Section 4(f) Properties

- **Comment:** This section notes that uses at the Des Plaines Conservation Area that include nature preserve and wildlife habitat are not protected by Section 4(f). We do not agree with t

determinations based on the applicability of Section 4(f), which also notes that publicly owned land used for wildlife are protected as well.

- **Response**: The area of Des Plaines within the B3/B4 corridor is used for hunting. FHWA directed that hunting is a dispersed use and therefore does not meet the requirements of Section 4(f). Text will be added to clarify the statements about what is a Section 4(f) use.
- **Comment:** Alternate Route 66 would be affected by overpasses even if no interchange is constructed directly with IL-53.
- **Response**: The effects on Alternate Route 66 will be determined through the Section 106 process. Additional text will be included referring that all design options, including overpasses, would have some effect but will be determined during Tier Two NEPA studies.

Subsection 3.15 – Special Lands

- **Comment:** Funding to either state under the Wildlife and Sport Fish Restoration Program by the USFWS will also need to be addressed.
- **Response:** A description of the Wildlife and Sport Fish Program will be added to Section 3.15 Special Lands in the FEIS. A brief reference will also be made in Section 3.8 Natural Resources. Any grants that have been obtained for special lands within the Corridors A3S2, B3, and/or B4 will be identified within the text.

Coordination Meeting with US Fish & Wildlife Service
DEIS Comment Responses
July 17, 2012: Directly Following the Section 7 Consultation Meeting
Conference Call-in Number: 877-829-8910; access ID 7799072#

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- **Response:** The design detail at the Tier One level do not have the detail to complete a technical traffic noise report, that would address both noise impacts and proposed noise mitigation, as required by FHWA, IDOT and INDOT's Traffic noise policies. These policies only address noise impacts to existing or planned areas with frequent human use and do not require traffic noise studies be completed for wildlife areas.

We have reviewed some of the documentation to investigate the potential for noise impacts to wildlife, in particular, birds. Forman (2002) indicates for multi-lane highways with ATD greater than 30,000 vehicles per day bird presence and breeding were reduced for 1,200 meters from the road. The working alignments within Corridor B3 range from approximately 350 to 950 meters from known avian breeding areas within the southwest and southeast portions of the Midewin National Tallgrass Prairie. Bird presence and breeding for several hundred meters within the Midewin National Tallgrass Prairie may be reduced by Corridor B3. Based on the 1,200 meter distance, reduced bird presence and breeding area within Midewin National Tallgrass Prairie would encompass between approximately 380 to 590 acres.

"As restoration on Midewin proceeds, the amount of cropland and successional vegetation will decline and be replaced by restored native vegetation, but at least 6,700 acres of agricultural grasslands will be maintained to support populations of area-sensitive grassland birds." (MNTP 2008 Land and Resource Management Plan (Prairie Plan) Amendment EA). The reduced bird presence and breeding area within Midewin National Tallgrass from Corridor B3 would account for approximately 6 to 9 percent of the total grassland habitat within Midewin for grassland bird species. Studies completed for Tier Two will identify bird species and potential direct and indirect effects to grassland bird species. Tier Two will identify avoidance and minimization measures and mitigation strategies if required. We have reviewed some of the documentation to investigate the potential for noise impacts to wildlife, in particular, birds. Studies completed for Tier Two will identify bird species and potential direct and indirect effects to grassland bird species.

Subsection 3.8 – Natural Resources

3.8.1 – Upland Communities

- **Comment:** This subsection should identify Midewin National Tallgrass Prairie (MNTP) as an Important Bird Area (IBA), as recognized by the National Audubon Society (Audubon).
- **Response**: Comment noted and changes have been made to the Final EIS.

3.8.2 – Wildlife Resources

- **Comment:** Breeding bird survey data likely under represents the diversity of migratory birds within the corridor area.
- **Response**: Comment noted. Additional information will be added to the Final EIS to indicate the importance of MNTP for local bird populations. We appreciate the additional information that was provided. In addition, detailed biological surveys will be completed in Tier Two, including avian censuses. Coordination with Midewin will be on-going and additional data will be obtained as necessary.

- **Comment:** Additional birds that are listed due to their rare or declining status in MNTP grassland bird management areas should be included in the document.
- **Response:** Additional bird information will be added to the Tier One document as appropriate.

- **Comment:** Wetland, shrubland, savanna, and woodland birds found near the southern boundary of MNTP, with some of these areas receiving funding from USFWS should be listed in the document.

- **Response:** Additional bird information will be added to the Tier One document as appropriate.

- **Comment:** Site specific information on grassland birds at JTA. Information about birds on the RCP and BCC lists should also be incorporated into the Tier One Final EIS.
- **Response:** More site specific information on birds will be obtained through the detailed biological surveys that will be completed for Tier Two. Additional bird information will be added to the Tier One document as appropriate.

- **Comment:** Studies have shown that the number of breeding woodland and grassland birds have declined significantly near roads as a result of noise. Rare and declining bird species found at MNTP and JTA that would be subject to increased vehicular noise may not be able to habituate to the increased disturbance levels because they are not native generalists, non-native colonizers, or urban species.
- **Response:** Comment noted. The project team would welcome the opportunity to work with your agency on an impact assessment to various bird species and to investigate potential mitigation measures that can be implemented to minimize or eliminated impacts. We anticipated that this coordination will begin shortly and that more information on birds will be obtained during Tier Two studies. During Tier Two, final alignments will be identified and appropriate mitigation measures that consider the roadway and its surrounding environment can be identified and developed.

- **Comment:** National Environmental Policy Act (NEPA) review of other transportation projects has resulted in identification of noise impacts to migratory birds and in substantial commitments to mitigate for those impacts through restoration of additional habitats.
- **Response:** Additional information will be added to the FEIS as appropriate.

- **Comment**: The Tier One Draft EIS fails to mention the adverse impacts of lighting from the proposed expressway on natural resources at JTA or MNTP. Artificial lighting from the expressway could disrupt the normal activities of insects which would be attracted to the increased amount of lighting. Of note are populations of the federally threatened eastern prairie fringed orchid (Platanthera leucophaea) located at MNTP. The orchid is primarily pollinated by hawk moths (Lepidoptera – Sphingidae). These moths could be attracted to bright lights, thereby reducing pollination opportunities for the orchid. In addition, the moths could be subject to increased predation, at dusk and at night, by bats and birds. In addition, artificial lighting could adversely affect other species in the area including bats.
- **Response:** Your comments on the potential effects of stray lighting on hawk moths' pollination of populations of the eastern prairie fringed orchid are acknowledged. The Tier One Final EIS includes discussion of this issue. During Tier Two studies, lighting impacts affecting the hawk moth in the direct vicinity of populations or habitat of the eastern prairie fringed orchid will be addressed, and lighting spectra, directionality, and intensity will be implemented that is minimally intrusive to the hawk moth while still meeting roadway lighting safety criteria.

- **Comment:** To mitigate for lighting impacts, the DOTs should consider the following measures. External lighting should be directed inward and limited to the minimum intensity necessary to provide night visibility. The DOTs should minimize stray light and consider lights that are less attractive to insects (lights with spectrum frequencies more toward the yellow-red end of the spectrum than the blue). The DOTs should also use International Dark-Sky Association approved

lighting for all external lights to reduce effects on crepuscular and nocturnal species. Lighting impacts should be discussed in the Tier One Final EIS.

- **Response:** The DOTs will work with your agency in developing a lighting plan that considers the natural environment, while not compromising motorist safety.

3.8.3 – Threatened and Endangered Species

- **Comment:** The Draft EIS notes that surveys for the Indiana bat (Myotis sodalis) will be conducted and presented in the Tier Two NEPA studies. During a meeting on August 14, 2012, IDOT staff noted that surveys would be conducted in Illinois and Indiana. The USFWS will work with IDOT to select appropriate mist netting sites. Mist netting surveys should also note the presence of the northern long-eared bat (Myotis septentrionalis). Other bat species USFWS is studying should be included in the document.
- **Response:** Detailed surveys for bats have been initiated in the corridor as part of the Tier Two study. This information will be included in the Tier Two EIS.

Subsection 3.9 – Water Resources and Aquatic Habitats

- **Comment:** USFWS recommends that the FEIS note that detention ponds do little to control stormwater runoff volumes.
- **Response:** The text in the FEIS has been revised, as requested.

- **Comment:** USFWS recommends that the FEIS indicate that infiltration BMPs should be constructed to offset additional stormwater runoff from new impervious surfaces.
- **Response:** The DEIS includes discussion on infiltration BMPs. Additional text regarding the construction of infiltration BMPs to offset additional stormwater runoff has been added to the FEIS.

- **Comment:** USFWS recommends that additional discussion on potential water quantity impacts and mitigation measures be provided.
- **Response:** Additional discussion on potential water quantity impacts and mitigation has been added to the FEIS.

- **Subsection 3.12 – Wetlands**

3.12.1 – Existing Conditions

- **Comment:** Figure 3-35, which shows the locations of wetlands and Waters of the United States, is too small, even with the enlarged insets, to adequately show the locations of wetlands relative to the proposed highway corridors. Each inset should individually be a page with a topographic map so that the actual locations of wetlands on the ground can be determined and streets and railroads are identified.
- **Response:** Additional exhibits with more detail will be added to the appendix to illustrate the wetland resources more clearly.

Subsection 3.14 – Section 4(f) Properties/Parks and Recreation

3.14.2 – Description of Section 4(f) Properties

- **Comment:** This section notes that uses at the Des Plaines Conservation Area that include nature preserve and wildlife habitat are not protected by Section 4(f). We do not agree with t

determinations based on the applicability of Section 4(f), which also notes that publicly owned land used for wildlife are protected as well.

- **Response**: The area of Des Plaines within the B3/B4 corridor is used for hunting. FHWA directed that hunting is a dispersed use and therefore does not meet the requirements of Section 4(f). Text will be added to clarify the statements about what is a Section 4(f) use.
- **Comment:** Alternate Route 66 would be affected by overpasses even if no interchange is constructed directly with IL-53.
- **Response**: The effects on Alternate Route 66 will be determined through the Section 106 process. Additional text will be included referring that all design options, including overpasses, would have some effect but will be determined during Tier Two NEPA studies.

Subsection 3.15 – Special Lands

- **Comment:** Funding to either state under the Wildlife and Sport Fish Restoration Program by the USFWS will also need to be addressed.
- **Response:** A description of the Wildlife and Sport Fish Program will be added to Section 3.15 Special Lands in the FEIS. A brief reference will also be made in Section 3.8 Natural Resources. Any grants that have been obtained for special lands within the Corridors A3S2, B3, and/or B4 will be identified within the text.

168 78A 8.10.6.4

ILLIANA CORRIDOR
PARTNERING FOR PROGRESS

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Schaumburg, Illinois 60196

100 N Senate Avenue, #N642
Indianapolis, Indiana 46204

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MEETING SIGN-IN SHEET

Date: Sept. 17, 2012
Location: USF&WS Barrington IL Field Office
Purpose: Section 7 Coordination

Name	Representing	Email Address
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United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, Pennsylvania 19106-2904

IN REPLY REFER TO:

August 29, 2012

9043.1
ER 12/504

Mr. John Fortmann
Illinois Department of Transportation
201 West Center Court
Schaumburg, Illinois 60196

Dear Mr. Fortmann:

As requested, the Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement (EIS) for the Illiana Corridor, Illinois and Indiana. The Department offers the following comments and recommendations for your consideration:

The Illinois Department of Transportation (IDOT) and the Indiana Department of Transportation (INDOT), in consultation with the Federal Highway Administration (FHWA), have prepared the Tier One Draft EIS to study transportation solutions for the Illiana project corridor. With respect to those portions of the Draft EIS for which the Department or its bureaus have jurisdiction or special expertise, we offer the following comments and recommendations for your consideration.

The U.S. Fish and Wildlife Service (USFWS) reviewed the information provided in your Tier One Draft EIS, and we have participated in reviewing the project as part of the Statewide National Environmental Policy Act/Clean Water Act Section 404 Merger process. During Tier One, we checked our records for the presence of federally listed species, USFWS trust resources, and other fish and wildlife resources that may be affected by the proposed project. Based on our review we offer the following comments, as they relate to fish and wildlife resources, which should be addressed in the Tier One Final EIS.

Section 1 – Purpose of and Need for Action

1 Section 1 discusses the Purpose and Need for the proposed action, which is the construction of a new limited-access highway between I-55 in Will County, Illinois and I-65 in Lake County, Indiana. It includes several figures depicting Average Daily Traffic (ADT) for 2010 and projected ADT for 2040 Without-the-Project (No Action Alternative). However, the figures are not consistent in showing existing area roadways and the traffic they carry now and projected traffic in 2040. Specifically, Figures 1-4 and 1-10 show existing ADT for all vehicles and for trucks, respectively, and they show the federal- and state-numbered highways and some of the local county roadways. However, just south of the Study Area, the number for Illinois State

1 (cont) Route (IL) 114 is present but the roadway itself is not. Also, its Indiana counterpart, SR-10 is not mapped. Currently, the SR-10/IL-114 highway combination receives considerable traffic, especially trucks, as the drivers avoid congestion on US-30, I-80/94, and other east-west roadways. Since this existing, and likely continuing under the No Action Alternative, use of smaller local roadways to avoid congestion further north is precisely what the Illiana Corridor Study is addressing, we believe that traffic on SR-10/IL-114 needs to be included in the discussion.

The two figures depicting the 2040 ADT projections for all traffic, Figure 1-5, and trucks alone, Figure 1-11, not only do not include SR-10/IL-114, they have dropped portions of SR-55 and SR-2 in Indiana and IL-17 in Illinois, while at the same time adding unnamed, apparently local, roads in both states in the central portion of the Study Area. To be consistent, the same roadways need to be evaluated in all four of the figures, and names of the roadways need to be provided.

Section 2 – Alternatives

2 Section 2 addresses the alternatives for an Illiana Expressway and includes a discussion of various constraints that influenced the determination of what alternatives to carry forward. Although Figures 2-2 Major Obstacles to East West Routes, 2-3 Built Environment and Populations Densities, and 2-5 Agricultural land Use, are of sufficient scale to adequately depict what they are addressing, Figures 2-4 Major Environmental Constraints and 2-6 NWI Areas are too small for the reviewer to be able to accurately determine where these features are on the landscape. We recommend that fold-out maps (11 in by 17 in) be used for these two figures.

Subsection 2.4 – Alternatives Evaluation
Subsection 2.4.2 - Initial Round Alternatives Evaluation

3 Subsection 2.4.2.5 discusses diagonal property severances due to highways not following east-west or north-south routes, with uneconomic remnants of fields or other access issues being the result. However, this section should also discuss the possibility of purchasing such parcels to serve as mitigation sites for woodlands and/or wetlands or streams, depending upon the soil types involved and the types of mitigation required, or for storm water quality improvement measures.

Section 3 – Environmental Resources, Impacts, and Mitigation

4 Section 3 describes the existing conditions and potential beneficial and adverse environmental, cultural, and economic impacts of a proposed Illiana Corridor. Subsection 3.1.2 contains a minor error: SR-41 needs to be corrected to US-41. Another nomenclature error occurs on Figures 3-1, 3-2, and 3-3, Figures 3-10 through 3-15, Figures 3-19 through 3-25, Figure 3-29, Figures 3-32 through 3-38, Figures 3-41 through 3-46, and Figure 3-52 where Belshaw Road south and west

5 from Lowell, Indiana is marked as SR-2; SR-2 goes west through Lowell to US-41, goes south with US-41, and turns southwest at the intersection with Belshaw Road. There is a similar error in Subsection 3.12.3.2, where an interchange at "Grant Street" is mentioned; elsewhere throughout the document this roadway is referred to as SR-55. Therefore we recommend that SR-55 be consistently called by that name.

6 In Table 3-1, all three working alignments are listed as having no impacts on threatened and endangered species. However, it is not yet known for certain that there will be no impacts on Federal or state listed species since all of the required surveys have not been completed, a fact that is acknowledged in the discussion on threatened and endangered species in Subsection 3.8.3.

Subsection 3.3 – Agricultural
Subsection 3.3.1 - Existing Conditions

7 Subsection 3.3.1.4, concerning drainage and irrigation, needs to discuss the extensive drainage systems that occur in southern Lake County, which would be affected the most by Alternative B4. The Kankakee River in Indiana was channelized for its entire length beginning in 1917; in association with this dredging, manmade Brown, Singleton, and Griesel Ditches were constructed on diagonals through the original extensive wetlands in southern Lake County to complete the drainage for agricultural purposes. These ditches intercepted natural streams flowing south from the Valparaiso Moraine into the Grand Kankakee Marsh, such as Stoney Run, Spring Run, Cedar Creek, West Creek, and others, and an extensive system of lateral ditches and tile drains were created.

Subsection 3.4 – Cultural Resources
Subsection 3.4.6 - Historic Resources

8 The discussion in Subsection 3.4.6.4 concerning project impacts on Alternate Route 66 needs to include information on the effects of increased traffic along this historic roadway, particularly truck traffic from and to various intermodals.

Subsection 3.6 – Noise

9 This section discusses the potential noise effects on humans. However, the Tier One Draft EIS does not evaluate the potential noise impacts on wildlife. Several studies indicate that noise can adversely affect migratory birds. The issue of noise impacts to migratory birds is discussed in more detail in our comments in Subsection 3.8.2. Due to the presence of significant wildlife areas within the study area, such as Midewin National Tallgrass Prairie, and the potential for adverse effects from the increased noise levels, noise impacts and their effects on wildlife should be considered and discussed in this subsection or Subsection 3.8.2 of the Tier One Final EIS.

Subsection 3.8 – Natural Resources
3.8.1 – Upland Communities

10 Subsection 3.8.1.1 describes how the Midewin-Des Plaines-Goose Lake Conservation Opportunity Area (COA) was identified in the Illinois Comprehensive Wildlife Action Plan (WAP) as critical for conserving wildlife and habitat within Illinois. This subsection should also identify Midewin National Tallgrass Prairie (MNTP) as an Important Bird Area (IBA), as recognized by the National Audubon Society (Audubon), due to the presence of grassland and other birds. Grassland birds are one of the most imperiled groups of birds in the world. The State of the Birds 2011 Report on Public Lands and Waters lists grassland birds among our fastest declining species and notes that the percentage of grassland birds on public lands is low because such a small amount of United States grassland (less than 2%) is both publicly owned and managed for conservation. The WAP notes the need for grassland bird habitat in the Grand Prairie Natural Division, which includes the Midewin-Des Plaines-Goose Lake COA. The

10 (cont) USFWS has a strong interest in the migratory bird habitat of the MNTP and has been involved in several efforts leading to its conservation. The USFWS has assisted with restoration efforts, and has provided funding for some of these efforts. Due to the high conservation potential of MNTP, resource agencies including the USFWS have recommended that restoration required as mitigation for other project impacts be conducted at MNTP. This information should be incorporated into the Tier One Final EIS.

11 The discussion of upland habitat communities in Subsection 3.8.1 also needs to indicate if any resources identified in the Indiana Comprehensive Wildlife Strategy, which is comparable with the Illinois Comprehensive Wildlife Action Plan, would be affected by any of the proposed project corridors.

12 The forested areas section needs to provide at least general information about the types of forests found in the proposed project area, such as beech-maple, oak-hickory, bottomland hardwoods, evergreen plantations, etc.

13 We do not agree with the statement under Invasive Species that the project is not anticipated to introduce new invasive plant species or increase the amount of such species. Depending upon the sources of required fill material, and whether or not construction equipment was used where other noxious species are found and not properly cleaned, invasive species not currently found in the Study Area could be introduced, and the land disturbance associated with project construction and operation could greatly increase habitat for various invasive or noxious species. Although the DOT's have procedures for addressing such species, the amount of work (man-hours) required to address invasive plants is likely to increase due to the increase in roadway mileage needing treatment; both DOT's already have strained resources for addressing invasive plant species within their rights-of-way.

14 Subsection 3.8.1.2 notes that upland community impacts were assessed based on approximate cover types that were identified through GIS mapping. We caution the use of GIS mapping without actual field investigations because habitat types may be misidentified; therefore, resulting in inaccurate impact estimates. For example, Forested Area #120, shown on Figure 3-24, is listed in Tables 3-55 and 3-57 of having a total area as 199.3 acres. However, based on Clean Water Act Section 404 wetland mitigation required for the Center Point North Intermodal Facility, we know that the majority of Forested Area #120 consists of dolomite prairie and that the portions south of the A3S2 working alignment are mostly devoid of trees. All impacted communities should be reevaluated and corrected, if necessary, in the Tier One Final EIS.

3.8.2 – Wildlife Resources

15 Subsection 3.8.2.1 discusses wildlife within the study area and uses the United States Geological Survey's (USGS) North American Breeding Bird Survey Route 34017 to provide a basis for bird distribution within the corridors. Using the most recent data for Route 34017, the Draft EIS notes that 51 species of breeding birds and 15 species of neo-tropical songbirds are present. The Draft EIS also notes the species for which MNTP met the criteria (based on the species identified) to be named as an IBA. Please note the breeding bird survey data represent a single sampling day of point counts taken along existing roadways and likely underrepresent the diversity of migratory birds within the corridor area. For example, MNTP has over 100 species of breeding birds and over 170 species of birds use the site for breeding, feeding, and wintering. MNTP is a significant grassland bird area in northeastern Illinois. Staff at MNTP manage grassland bird management areas throughout the site. Of note for the Illiana project are grassland bird management areas near the southern boundary of the site and along IL-53.

16 Grassland birds found in these management areas include: bobolink (Dolichonyx oryzivorus), dickcissel (Spiza americana), eastern meadow lark (Sturnella magna), grasshopper sparrow

16 (cont) (Ammodramus savannarum), Henslow's sparrow (Ammodramus henslowii), upland sandpiper (Bartramia longicauda), savannah sparrow (Passerculus sandwichensis), sedge wren (Cistothorus platensis), northern harrier (Circus cyaneus), upland sandpiper (Bartramia longicauda), loggerhead shrike (Lanius ludovicianus), and field sparrow (Spizella pusilla). Dickcissel, Henslow's sparrow, upland sandpiper, and loggerhead shrike are all listed on the USFWS's Region 3 Fish and Wildlife Resource Conservation Priorities (RCP) list and the USFWS's Birds of Conservation Concern (BCC) 2008 list. All of these bird species are listed due to their rare or declining status and therefore, have a need for special conservation attention.

17 Wetland, shrubland, savanna, and woodland birds also are found near the southern boundary of MNTP, with some of these areas (e.g., wetland areas) receiving funding from the USFWS to benefit migratory birds. Some birds of note in these groups that are on the USFWS's RCP and BCC lists are: pied-billed grebe (Podilymbus podiceps), American bittern (Botaurus lentiginosus), least bittern (Ixobrychus exilis), black-billed cuckoo (Coccyzus erythropthalmus), Bell's vireo (Vireo bellii), and red-headed woodpecker (Melanerpes erythrocephalus).

18 In addition to MNTP, the Joliet Training Area (JTA) is also significant as a grassland bird area. Grassland birds have been monitored for several years at JTA, south of the AS32 Alternative, with as many as 51 grassland associated bird species observed in the old fields, tree lines, and woodlots. Of these 51 species, 7 are obligate grassland bird species and JTA provides critical breeding habitat for them. These seven species are: bobolink, dickcissel, eastern meadow lark, grasshopper sparrow, Henslow's sparrow, savannah sparrow, and sedge wren. Other grassland associated birds that have been observed at JTA are: northern harrier, upland sandpiper, and field sparrow. Habitat for migratory birds is also present at the Des Plaines Conservation Area. Site specific information about migratory birds should be obtained and incorporated into the Tier One Final EIS. Information about birds on the RCP and BCC lists should also be incorporated into the Tier One Final EIS.

19 Impacts to wildlife and natural communities are discussed in Subsection 3.8.2.3. As previously noted, the Tier One Draft EIS does not evaluate the potential noise impacts on wildlife, particularly migratory birds. Adverse impacts to migratory birds could occur in the form of direct stress, masking of predator arrival or associated alarm calls, and by interference of acoustic signals in general (Slabbekoorn and Ripmeester 2008). Research exists that indicates thresholds for which adverse effects would be seen in migratory birds. In a series of studies in the Netherlands, Reijnen et al. (1987, 1995, 1996, 1997), Reijnen and Foppen (1994, 1995), and Foppen and Reijnen (1994) have shown that the number of breeding woodland and grassland birds have declined significantly near roads as a result of noise. The farthest distance for which reductions in the numbers of breeding birds were still observed from the roads was 1500 meters (4,921 feet). These studies also showed that noise levels as low as 50 dBA resulted in an adverse effect on breeding birds (with several studies showing an effect below 60 dBA). In these studies, 33 of 45 investigated woodland bird species were adversely affected by noise and 7 of 12 grassland species were adversely affected. In a more recent study, Forman et al. (2002) also showed that several species of grassland birds (especially bobolink and eastern meadowlark) decreased in numbers and breeding densities near roads. The Forman et al. (2002) study showed that vehicular noise adversely affects grassland birds, and based on the vehicles per day for a multilane highway (≥ 30,000 vehicles per day in the study), bird presence and breeding was reduced for 1200 meters (3,937 feet) from a road. 2040 ADT volumes show that Alternative B3 would have the highest ADT at 34, 548 vehicles per day (vpd) followed by Alterative A3S2 (33,992 vpd) and Alternative B4 (28,382 vpd).

19 (cont) Although it is acknowledged that some bird species habituate to increased noise levels, this ability may be due to the fact that species able to habituate are native generalists or non-native colonizers (Kasloo and Tyson 2004, Slabbekoorn and Ripmeester 2008). Slabbekoorn and Ripmeester (2008) note that several of the native generalists or non-native colonizers are able to adapt to urban noise conditions. Rare and declining bird species found at MNTP and JTA that would be subject to increased vehicular noise may not be able to habituate to the increased disturbance levels because they are not native generalists, non-native colonizers, or urban species.

20 National Environmental Policy Act (NEPA) review of other transportation projects has resulted in identification of noise impacts to migratory birds and in substantial commitments to mitigate for those impacts through restoration of additional habitats. Based on the bird data for MNTP and JTA and the proximity of the potential alignments to these sites, any of the three alternatives could adversely impact migratory birds. FHWA and the DOTs should discuss the potential mitigation measures for these impacts with the USFWS prior to the Tier One Final EIS.

21 The Tier One Draft EIS fails to mention the adverse impacts of lighting from the proposed expressway on natural resources at JTA or MNTP. Artificial lighting (light pollution) from the expressway could disrupt the normal activities of insects which would be attracted to the increased amount of lighting. Of note are populations of the federally threatened eastern prairie fringed orchid (Platanthera leucophaea) located at MNTP. The orchid is primarily pollinated by hawk moths (Lepidoptera – Sphingidae). These moths could be attracted to bright lights, thereby reducing pollination opportunities for the orchid. In addition, the moths could be subject to increased predation, at dusk and at night, by bats and birds. Hawk moths have been collected pollinating the orchid adjacent to MNTP in studies conducted by our staff. Increased lighting and a decrease in hawk moth numbers could adversely affect the orchid population in the vicinity. In addition, artificial lighting could adversely affect other species in the area including bats.

22 To mitigate for lighting impacts, the DOTs should consider the following measures. External lighting should be directed inward and limited to the minimum intensity necessary to provide night visibility. The DOTs should minimize stray light and consider lights that are less attractive to insects (lights with spectrum frequencies more toward the yellow-red end of the spectrum than the blue). The DOTs should also use International Dark-Sky Association approved lighting for all external lights to reduce effects on crepuscular and nocturnal species. Lighting impacts should be discussed in the Tier One Final EIS.

3.8.3 – Threatened and Endangered Species

23 The Draft EIS notes that surveys for the Indiana bat (Myotis sodalis) will be conducted and presented in the Tier Two NEPA studies. During a meeting on August 14, 2012, IDOT staff noted that surveys would be conducted in Illinois and Indiana. The USFWS will work with IDOT to select appropriate mist netting sites. Mist netting surveys should also note the presence of the northern long-eared bat (Myotis septentrionalis), if detected. The USFWS has been petitioned to review the conservation status of this species and make a determination of whether listing as threatened or endangered is warranted under the Endangered Species Act (ESA). A 90-day finding on a petition to list the eastern small-footed bat (Myotis leibii) and the northern long-eared bat as endangered or threatened under the ESA was recently published in the Federal Register. Based on the USFWS's review, we found that the petition presented substantial

23 (cont) scientific or commercial information indicating that listing of the eastern small-footed bat and the northern long-eared bat may be warranted. With the publication of the Federal Register notice, we initiated a review of the status of these species to determine if listing them as endangered or threatened is warranted. Based on the status review, we will issue a 12-month finding on the petition, which will address whether the petitioned action is warranted, as provided in the Act. The 12-month finding determination is scheduled by the end of September 2012. The USFWS will provide specifics for the various surveys.

24 The Tier One Draft EIS notes that multiple known locations for the eastern massasauga (Sistrurus catenatus) are known from within the Goodenow Grove Nature Preserve adjacent to Corridor A3S2 and that the eastern massasauga is currently a candidate species. However, the document does not indicate that surveys would be conducted for the species. Eastern massasauga surveys should be conducted in suitable habitat and under suitable conditions in the vicinity of Goodenow Grove Nature Preserve.

25 Determinations of "no effect" were made for several federally listed species that may occur throughout the corridor. We are in general agreement with these effects determinations. The Tier One Final EIS should consider adding a column to Table 3-58 indicating the effects determinations for species that will not require surveys in the Tier Two NEPA studies.

26 The discussion of State-listed species known or possible within the Study Area needs to acknowledge that the information is based on reports from various individuals, from private landowners, to citizen scientists, to professional scientists, and rarely from comprehensive studies or surveys, so the data cannot be considered complete. Therefore, additional species beyond those mentioned in this document may be present but currently unknown.

Subsection 3.9 – Water Resources and Aquatic Habitats
3.9.3 – Impacts

27 Subsection 3.9.3.2 discusses increases in impervious surfaces and subsequent increases in stormwater runoff volumes, and loss of infiltration. This section also goes on to state that stormwater detention ponds would be constructed to control the volume of stormwater runoff associated with the additional impervious surfaces. This portion of the Tier One Final EIS should be changed to note that detention ponds do very little to control stormwater runoff volumes but, as indicated in this subsection, do provide temporary storage of stormwater runoff and control the release rate of stormwater to receiving waters. The Tier One Final EIS should

28 indicate that infiltration best management practices (BMPs) should be constructed to offset the additional stormwater runoff from the new impervious surfaces.

29 This subsection should also discuss measures to mitigate water quantity impacts, as well as water quality impacts, as various studies have shown that increases in water quantity have adverse impacts on aquatic resources. Subsection 3.9.4 – Mitigation, should similarly be updated to expand on discussion of water quantity impacts and BMPs to offset those impacts. The USFWS is committed to working with FHWA and the DOTs to identify adequate BMPs, including infiltration BMPs, which can be used to address water quantity and quality impacts to natural resources.

Subsection 3.10 – Groundwater Resources
Subsection 3.10.5 – Seeps

Subsection 3.10.5 discusses the presence of seeps in some locations, particularly along the Des Plaines and Kankakee Rivers. However, seeps and springs are also known to occur throughout the Valparaiso Moraine, which would be crossed in Indiana by Alternatives A3S2 and B3, so there may be currently unmapped seeps or springs that could be directly or indirectly affected.
30 Unless the groundwater recharge area for each seep or spring is known, it cannot be stated that the project would be unlikely to substantively affect water quality or quantity reaching the seeps "because the overall net increase in impervious area as compared to the overall surface area of the groundwater recharge area is small." For some seeps, the new highway could encompass a large percentage of the groundwater recharge area. Also, there is the possibility that the highway would be proposed directly over a seep or spring if their current locations are unknown, which would create significant engineering problems and well as groundwater issues.

Subsection 3.11 – Floodplains

Subsection 3.11 concerning floodplains needs to address the fact that the Kankakee River floodplain has been significantly affected by the channelization of the river in Indiana and the construction of an extensive system of drainage ditches and tiles. The 100-year floodplain has not been flooded in its entirety by the river since the channelization almost 100 years ago, although localized flooding associated with the various ditch and stream networks does occur,
31 often due to ponding until the water can find an outlet downstream in this very flat former wetland. This flooding is usually associated with rapid snowmelt or extensive rains, such as Hurricane Ike in September 2008, which dropped from 6 to more than11 inches of rain during a 4 day period in Lake, Porter, and LaPorte Counties. Since Alternative B4 is so far south in the floodplain, between Vannatti Ditch and Brown Ditch, it is more likely to be affected by or to affect flooding than if it were further north, such as closer to Singleton Ditch. Concerning mitigation for floodplain filling, we would not support excavating natural stream banks to
32 provide additional flood storage since this would adversely affect instream aquatic habitats, water temperature, and water quality.

Subsection 3.12 – Wetlands
3.12.1 – Existing Conditions

This subsection indicates that the largest identified wetland complex, which would be impacted by A3S2, is lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded (L1UBHh) wetland associated with the Des Plaines River. It should be noted that the L1UBHh wetland is the Des Plaines River and impacts to this area should not be counted as wetland
33 impacts but as river impacts. Changes should be made in the appropriate sections in the Tier One Final EIS.

Figure 3-35, which shows the locations of wetlands and Waters of the United States, is too small,
34 even with the enlarged insets, to adequately show the locations of wetlands relative to the proposed highway corridors. Each inset should individually be a page with a topographic map so that the actual locations of wetlands on the ground can be determined and streets and railroads are identified. Apparently the proposed B3/A3S2 Corridor is half way between 159th Avenue on
35 the north and 171st Avenue on the south, which affects a large number of wetlands. It needs to

35 (cont) be made clearer earlier in the text concerning potential wetland impacts that Tables 3-69 and 3-70 address the entire 2000-foot wide alternative Corridors and Tables 3-71 and 3-72 address the 400-foot wide Working Alignments. Table 3-72 needs to use SR-55 as the location of a proposed interchange, not Grant Street. In general, we support bridging of wetlands rather than the placement of fill even though vegetation under the bridges is likely to die due to shading.

36

Subsection 3.14 – Section 4(f) Properties/Parks and Recreation
3.14.2 – Description of Section 4(f) Properties

37 This section notes that only the portions of the Des Plaines Conservation Area and MNTP that have recreational uses are protected by Section 4(f). This section also notes that uses at the Des Plaines Conservation Area that include nature preserve and wildlife habitat are not protected by Section 4(f). We do not agree with these determinations based on the applicability of Section 4(f), which also notes that publicly owned land used for wildlife are protected as well. Both the Des Plaines Conservation Area and MNTP fall under this category and the Tier One Final EIS should be changed to acknowledge that portions of both areas that provide wildlife habitat are protected by Section 4(f).

Although it is acknowledged in Table 3-1 that historic Alternate Route 66 would be affected by a new, large interchange with Design Concept 1, it should also be indicated that it would be affected by overpasses even if no interchange is constructed directly with IL-53. This Section 4(f) resource is also likely to be affected by increased traffic if either Alternative B3 or B4 is constructed due to trucks accessing and leaving the intermodals to the north.

Subsection 3.15 – Special Lands

38 Concerning Special Lands, funding to either state under the Wildlife and Sport Fish Restoration Program (previously known as Federal Aid) by the USFWS will also need to be addressed. The requirements of this Program are similar to those of the Land and Water Conservation Fund Program of the National Park Service.

Subsection 3.19 – Indirect and Cumulative Impacts

39 In regard to indirect and cumulative impacts, the Tier One Draft EIS focuses on the project's potential to induce development near proposed project interchanges and determined that "impacts from such sources as highway noise, air quality, and lighting from these corridor are not expected to be adverse since it is commonly believed that relatively mobile birds and wildlife would move away from such sources." The USFWS believes this assessment of indirect and cumulative impacts is narrow in scope and that the DOTs (INDOT and IDOT) should expand their assessment of indirect impacts. Furthermore, the USFWS does not agree with the DOT's determination that impacts for the aforementioned sources are not expected to be adverse. Lighting associated with additional development near the project interchanges could have substantial impacts on wildlife use of the MNTP. The USFWS has provided information to support our position on sources such as highway noise and lighting and the impacts that these sources can have wildlife resources. An example of indirect and cumulative impacts associated with the project would be increased truck traffic along IL-53 and increased vehicular noise associated with that truck traffic. This would further expand the noise impact zone along IL-53,

39 (cont)

further into the grassland bird management areas on both sides of IL-53 and further reducing bird usage at MNTP. The Tier One Final EIS should fully assess all possible impacts to wildlife resources, especially at areas such as MNTP, JTA, and the Des Plaines Conservation Area. Based on the information that the USFWS has provided, the Tier One Final EIS should also further assess potential cumulative impacts from other projects that were mentioned in the Draft EIS, such as the South Suburban Airport and the Chicago to St. Louis high speed rail project, as these projects could cause cumulative impacts to wildlife resources in the project study area.

This letter provides comment under the authority of, and in accordance with, the provisions of the National Environmental Policy Act of 1969 (83 Stat. 852, as amended P.L. 91-190, 42 U.S.C. 4321 et seq.), the Fish and Wildlife Coordination Act of 1956 (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), the Migratory Bird Treaty Act (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.), and the Bald and Golden Eagle Protection Act (54 Stat. 250, as amended; 16 U.S.C. 668-668d).

The Department looks forward to continued coordination with FHWA and the Applicants to ensure that project impacts to resources of concern to the Department are adequately addressed. For matters related to fish and wildlife resources and federally listed threatened and endangered species in the Illinois portion of the study area, please continue to coordinate with Mr. Shawn Cirton, U.S. Fish and Wildlife Service, 1250 South Grove Avenue, Suite 103, Barrington, Illinois 60010, phone 847-381-2253, extension 19, fax 847-381-2285. For the Indiana portion of the study area, please continue to coordinate with Ms. Elizabeth McCloskey, P.O. Box 2616, Chesterton, Indiana 46304, phone 219-983-9753, fax: 219-983-9816.

We appreciate the opportunity to provide these comments.

Sincerely,

Lindy Nelson
Regional Environmental Officer

cc: FWS, Barrington, IL
FWS, Chesterton, IN

Illiana Corridor
Phase I Study

RESOURCE AGENCY BIOLOGICAL ASSESSMENT COORDINATION MEETING SUMMARY

Date:	**October 24, 2013**
Time:	**2:00 PM**
Location:	**U.S. Fish & Wildlife Service, 1250 Grove Street, Barrington, IL**

Upon completion of the draft Biological Assessment (BA), the project team continued informal Section 7 Consultation with the U.S. Fish & Wildlife Service (USFWS) and delivered the Draft BA to the Illinois USFWS for their review. The Illinois Department of Transportation (IDOT) has requested an informal review of the BA to assist the project team in developing the DEIS schedule.

After introductions, S. Schilke presented the Draft Biological Assessment to the Chicago Field Office of the USFWS.

S. Schilke and J. Novak provided a brief summary of the status of the project. S. Schilke mentioned that a copy of the BA is being delivered to the Indiana USFWS office. J. Novak summarized the approach to writing the BA stating that guidance on document formatting provided by S. Cirton was utilized. Minor formatting changes were incorporated to provide additional information similar to that provided for the recent IDOT Illinois Route 22 BA for the eastern prairie fringed orchid (*Platanthera leucophaea*). J. Novak stated that the BA was prepared to assess impacts to all species in relation to the proposed Illiana Corridor listed on the USFWS Endangered Species Act: Section 7 (a)(2) website for Will County, Illinois and Lake County, Indiana (see Table ES-1 within the BA). J. Novak then summarized the Effect Determination findings for each species per Table ES-1. S. Cirton stated that the Effect Determinations within the draft BA may be changed based on discussions at the meeting and after his review. S. Cirton mentioned that the status of the northern long-eared bat (*Myotis septentrionalis*) should be changed to 'proposed for listing' within the BA instead of Candidate species.

S. Cirton inquired why the northern long-eared bat Effect Determination was "not likely to adversely affect". J. Novak explained that because habitat for the northern long-eared bat is similar to the Indiana bat (*Myotis sodalis*) and based on the tree clearing restriction timeframe (October 16 to March 31), it was assumed that the impacts to the northern long-eared bat would be avoided. S. Cirton indicated that the effects determination for the northern long-eared bat should be changed. S. Cirton indicated that it could be stated as "may affect, but not likely to adversely effect", but this could change based on the USFWS review. S. Cirton indicated that bat numbers are dropping so dramatically due to white-nose syndrome that their office is now looking at protection of all habitat, including their summer habitat. Therefore, the USFWS is reassessing their stance on tree clearing as an avoidance measure for bats.

S. Cirton stated that the the northern long-eared bat is actually more of a habitat generalist than the Indiana bat. L. Reich stated that the "not likely to adversely affect" determination was also based upon the distance of the closest hibernacula to the Illiana Corridor. S. Cirton stated that Blackball Mine, the closest hibernacula to the Illiana Corridor, is actually 40 miles away, which is a distance that bats travel. S. Cirton stated that the USFWS has records for the northern long-eared bat in other locations near the Illiana Corridor aside from those documented in the BA. S. Cirton also stated that no definite decision has been made regarding how minimization/avoidance of impacts to the northern long-eared bat will be handled; however, measures to minimize impacts/avoid impacts to this species will likely be similar to the Indiana bat.

S. Cirton mentioned that the USFWS 'bat team' is looking more closely at habitat and specific locations where the northern long-eared bat may be present in general. W. Zyznieuski stated that previous Illinois Natural History Survey (INHS) assessments for the Indiana bat within IDOT District 1 could serve as a useful tool to document the absence of the northern long-eared bat within District 1. S. Cirton reiterated that a different approach may be used for the northern long-eared bat and that tree clearing restrictions may not suffice as the primary tool for avoidance. S. Cirton stated that because of white nose syndrome, summer habitat is growing in importance and that tree clearing protocols may change.

S. Schilke asked if the tree clearing restriction does not suffice, would this change the effect determination or would it change the mitigation. S. Schilke mentioned that tree replacement could occur in areas where replacement of suitable habitat could be achieved. S. Cirton stated that young, replacement trees wouldn't really serve as habitat in the short term. S. Cirton stated that the northern long-eared bat determination would likely be changed to "likely to adversely affect" and that he will discuss this with the USFWS "bat team". S. Schilke requested input from the USFWS on how to mitigate potential impacts to the northern long-eared bat. S. Cirton reiterated avoidance of impacts to the northern long-eared bat. S. Schilke stated that 1:1 replacement of impacted trees can help to mitigate where avoidance is not possible.

J. Novak summarized listed species within Lake County, Indiana and mentioned Appendix M (USFWS Correspondence concerning the Indiana bat in Northeast Illinois) within the BA. J. Novak also went through the overall structure of the BA.

S. Cirton inquired about mussel surveys within the Kankakee River, specifically in relation to the sheepnose mussel (*Plethobasus cyphyus*). J. Novak stated that surveys were conducted and that a fresh dead specimen of the sheepnose was collected approximately 1,200 feet downstream of its confluence with Forked Creek during field surveys by the INHS. J. Novak also discussed measures to avoid impacts to the sheepnose, which include pre-construction mussel surveys to relocate all native mussel within the stretch of the Kankakee River proposed for in-stream work as well as in-stream work timeframe restrictions (i.e. during the spawning timeframe of the sheepnose host fish, the sauger [*Sander canadensis*]). S. Cirton inquired about where sustainability

opportunity areas are being used in relation to the sheepnose mussel and construction of the Kankakee River bridge. S. Cirton stated that these should be identified within the BA. S. Ott mentioned that the effects evaluation utilized Best Management Practices (BMPs) outlined in the Sustainability Opportunity Areas Technical Memorandum (Christopher B. Burke Engineering, Ltd., 2013).

In addition to the BMPs that are being proposed, S. Ott mentioned that avoidance measures such as avoiding or minimizing impacts to large forested area (Forested Site 8), located east of the proposed I-65 and Illiana interchange are being considered which should be considered relative to bat habitat protection.

S. Ott stated that an electronic Word version of the BA has been provided to S. Cirton so that he can edit or add comments to the document.

S. Cirton stated that he will work with the project team to come up with measures to minimize impacts to those species that may be impacted so that the formal review process is not needed. If a species is determined to be adversely affected, the formal process is required.

S. Schilke discussed the next steps for the BA process, mentioning that the EPA has requested a copy of the BA. S. Cirton stated that the BA may be sent to the EPA for their comment. S. Schilke stated that the DEIS will be finalized in November and inquired about the USFWS schedule for review of the BA. S. Cirton stated that it typically takes 30 days to review the draft and at that time it will be determined if formal consultation is needed. S. Cirton stated that if formal consultation is required, the USFWS has 135 days to review. S. Schilke stated that the project team would need to know if the BA will go to formal consultation by mid-November in order to include in the DEIS. S. Cirton stated that he can review the draft BA by November 15. S. Cirton also mentioned that we will need the Indiana USFWS office to complete their review by November 15 as well. S. Cirton also stated that information from the BA will be included in the DEIS whether consultation is formal or informal.

IDOT and the FHWA indicated that they would like to initiate formal consultation as soon as possible to meet NEPA schedules. S. Cirton indicated that their office determines whether formal or informal consultation is required.

The meeting concluded at approximately 3:40 PM.

Attendees:
Shawn Cirton – U.S. Fish and Wildlife Service
Matt Fuller, Federal Highway Administration
Steve Schilke – IDOT
Walter Zyznieuski – IDOT (phone)
Susan Dees Hargrove – IDOT (phone)
Felecia Hurley – IDOT (phone)

Tom Brooks – IDOT (phone)
Steve Ott – Parsons Brinkerhoff
Rick Powell – Parsons Brinkerhoff
Katie Kukielka – IDOT/AECOM
Jim Novak – Huff & Huff, Inc.
Lailah Reich – Huff & Huff, Inc.

DRAFT

Sustainability Opportunity Areas Technical Memorandum

Prepared For:

Parsons Brinckerhoff

Prepared By:

Christopher B. Burke Engineering, Ltd.

November 2013

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Appendix A: Sustainability Opportunity Areas Concept Plan: Alternatives 1, 2 and 3

Appendix B: Sustainability Opportunity Areas Concept Plan: IL-53 Design Options

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1.0 Overview

The proposed Illiana Corridor build alternatives will unavoidably impact people, landscape, flora, fauna, and water resources. This Technical Memorandum focuses on identifying at a broad scale a variety of post construction Best Management Practices (BMPs) and Sustainability Opportunity Areas. These concepts were then applied to various alternatives where the BMPs could be implemented to minimize or mitigate potential impacts of the Illiana Corridor project on wetlands, creeks, and other natural resources and the built environment.

The Sustainability Opportunity Areas were identified through a collaborative, interdisciplinary approach known as Context Sensitive Solutions (CSS). CSS implements theoretical and practical decision-making and takes into consideration the "context" of the surroundings, along with input from key project stakeholders. This process was used to identify appropriate BMPs that could be implemented to minimize impacts while appropriately fitting into the landscape.

The CSS process emphasizes that transportation facilities should fit within their physical settings and preserve scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. CSS asserts that decisions should be responsive to the context of the footprint to the surrounding area, not simply responsive to the design process. CSS seeks to balance the need to move vehicles efficiently and safely with other desirable outcomes, including environmental sustainability. During the design process, opportunities are sought out to avoid, minimize, restore or enhance habitats to provide a net benefit to the environment. For instance, if a proposed highway passes through a wetland area, the roadway design should include elements that minimize the impact to the wetland, and also mitigates, to the extent possible, the impacts that would otherwise occur on an ecological and water quality basis.

Regional green infrastructure was also taken into consideration when identifying BMP Opportunity Areas.

As part of the Illiana Corridor roadway design, a suite of BMPs are being considered that would:

- Provide water quality protection or improvement by enhancing filtration and infiltration of stormwater prior to discharging from the site.
- Minimize impacts to wetland and waters of the U.S., as well as forested areas.
- Facilitate safer movement of terrestrial (flightless) wildlife across the project footprint.

The following provides a detailed description of the various BMPs listed in the legend of the concept plans. Appendices A and B include Sustainability Opportunity Area Concept Plans for each of the three mainline Alternatives 1, 2, and 3, and the IL-53 design options, respectively.

1.1 Water Quality Best Management Practices

Nearly all runoff draining from pavement or generated within the project constructed footprint will pass through a series of BMPs (Treatment Train) prior to discharging from the footprint. All of the BMP measures will filter runoff and, to some extent, promote infiltration of stormwater runoff; thereby minimizing the potential for surface water quality degradation.

Figure 1-1. BMP Opportunity Types

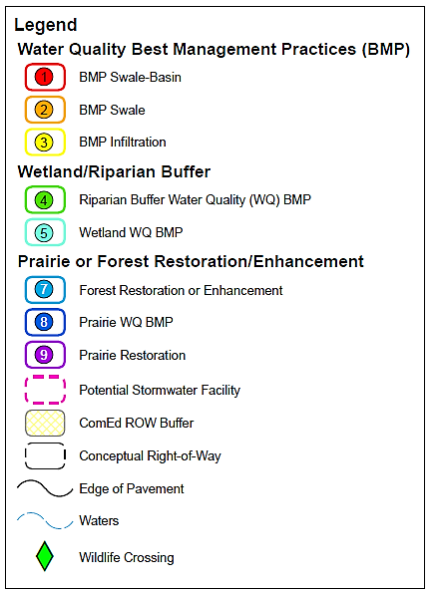
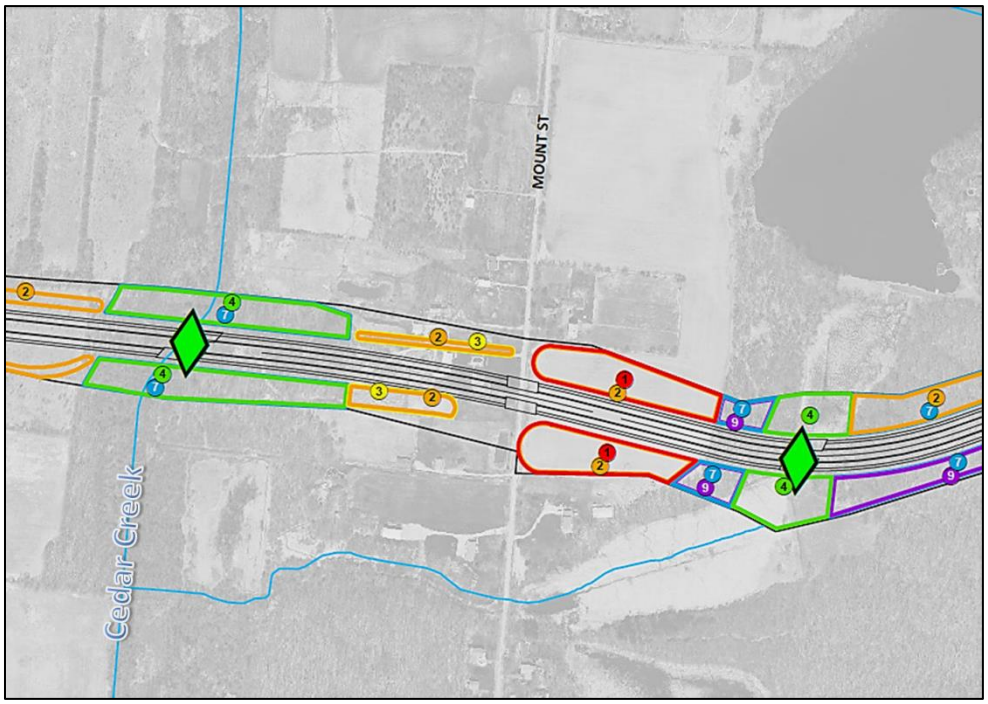


Figure 1-2. BMP Opportunity Area Example



1.1.1 BMP Swales/Basin

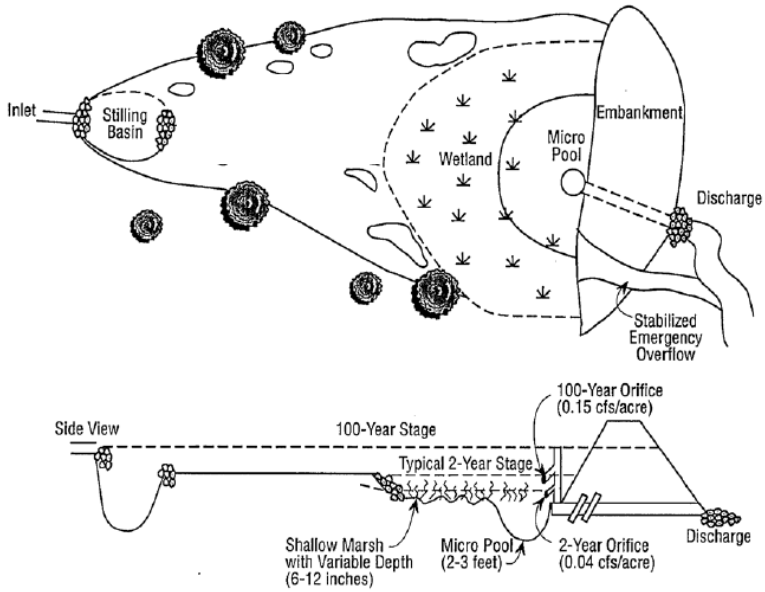
BMP swales and basins would be constructed along the roadside wherever they can physically be installed and provide a functional benefit. The BMP swales and basins may be designed with gravel bases that, to the extent possible, would be over-excavated to intersect with the underlying parent sands and gravels. The BMP swales and basins could be designed to capture a water quality volume which would reduce the total surface water discharge volume from the site. The BMP swales and basins would be planted with native vegetation, and undergo long term maintenance and management to promote native dominated plant communities.

Figure 1-3. Representative BMP Swale Basin View

BMP Swales/Basins would generally function as detention, compensatory flood storage and water quality treatment basins that are dual purposed as stormwater BMPs. These facilities would be established with native vegetation and typically have wetland bottoms. These areas would be designed to have native species, and if possible, based on the underlying geology, be designed to maximize infiltration through a connection to underlying sands and gravels. The basins would be designed to capture additional sediment, nutrients and oils that may not have been filtered out by other BMPs located upslope.

The detention basins would also be designed to capture a water quality volume resulting in a theoretical zero discharge of runoff generated from within the footprint for the design storm event. The current thinking is that the water quality volume would be based on a 0.75 inch event which correlates to approximately 88 percent of all rainfall events measured at O'Hare International Airport and 57 percent of the annual volume of precipitation. Rain events at or below this volume would be captured onsite and infiltrated, evaporated or evapotransporated.

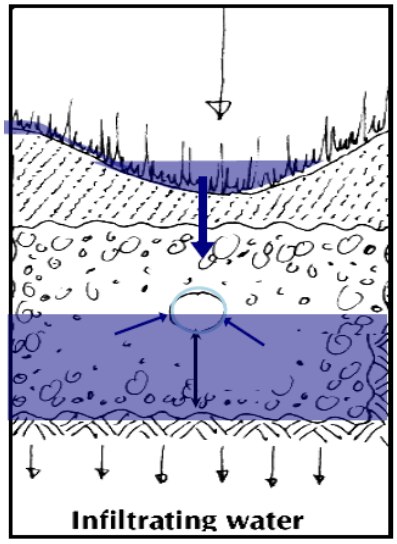
Figure 1-4. Representative BMP Basin Design



1.1.2 BMP Swale

BMP Swales are generally long narrow areas that under normal highway design circumstances would likely be a roadside ditch or swale that is modified to optimize pollutant removal. The bioswales would be designed to capture a water quality volume reducing the total stormwater discharge volume from the site. The bioswales would be designed to slow down flow velocities and increase residence time to maximize filtration of stormwater runoff reducing the total stormwater discharge from the site. The bioswales would be planted with native vegetation, and undergo long term maintenance and management.

Figure 1-5. BMP Swale Function



1.1.3 BMP Infiltration Area

BMP Infiltration Areas may be implemented in areas with limited work space or significant changes in elevation limiting the total surface area available to construct a full size facility. Infiltration BMPs can be small ponds which are intentionally tied into the underlying strata to promote groundwater recharge and limit surface water runoff. Or, BMP (leaky) catch basins could be installed to also promote filtration and infiltration. The infiltration catch basins would be integrated into the project design to work in conjunction with the installation of native-vegetated bioswales or other BMPs within roadside areas.

1.1.4 Manufactured or Structural BMPs

Manufactured or Structural BMPs typically consist of underground concrete structures used to filter runoff in locations where surface treatment is not possible. We did not explore their use for this report. Manufactured or Structural BMPs may be used if locations are identified during design which cannot accommodate a surface system, but sufficient treatment of runoff is necessary.

1.2 Riparian and Wetland Buffer Water Quality BMPs

Riparian and wetland buffer areas can be designed within farmland adjacent to existing wetland, waters, or floodplain within the project footprint. These BMPs would provide and create (with minimal grading effort) additional native habitat using the existing topography and hydrology of the land that would also help to filter runoff.

1.2.1 Riparian Area Water Quality BMP

A number of streams and ditches would be crossed by the project footprint. At many of these crossings, there are narrow strips of existing vegetation associated with the channel which transitions immediately to farm field. Each of these crossings was reviewed and, to the extent possible, a minimum 100 foot riparian buffer BMP area is proposed to be installed on both sides of the creek to provide water quality, wildlife, and bank stability benefits at each location. These areas would be established with native species selected for the expected hydrologic regimes at each location.

1.2.2 Wetland Water Quality BMP

Wetlands are scattered throughout the footprint, as are many poorly drained areas that appear to be farmed wetland (based on available aerial photography and topography). These farmed areas are sometimes isolated in fields or located in floodplain in close proximity to creeks, streams or ditches. These areas would require minimal effort to establish wetland habitats providing wildlife habitat and functioning as stormwater BMPs for the new roadway.

1.3 Prairie – Forest (Upland) Restoration/Enhancement Opportunity Areas

There are a number of areas where creeks, streams and rivers are crossed and where upland areas would remain within the footprint that with minimal effort could be restored to a native upland habitat. In addition, there are existing naturalized areas within the footprint that could undergo enhancement activities to improve their floristic quality and wildlife habitat value.

1.3.1 Forest Restoration/Enhancement Opportunity Areas

Several large forested areas will be crossed which contain farm field inclusions or are existing stands of woodland. In either case, these areas could benefit from establishment of additional woodland to fill in gaps to limit edge effect, or undergo enhancement to promote a predominance of native vegetation. These areas would provide improved wildlife habitat, and in some cases provide a water quality benefit by filtering roadway runoff.

1.3.2 Prairie Restoration Opportunity Areas

There are several large areas of upland that exist within the footprint that likely would not establish as wetland without extensive grading, but could be established as prairie to increase the overall coverage of natural area. These areas would provide a net ecological benefit by filtering runoff and providing wildlife habitat and native species diversity. An example includes the large proposed infield areas associated with the I-65/Illiana Corridor interchange.

1.3.3 Prairie Enhancement Opportunity Areas

Several large areas of existing upland vegetation could be restored as prairie to increase the overall coverage of natural areas. These areas may not be close enough to the roadway to function as a water quality BMP, but would provide benefits associated with native vegetated prairie areas.

1.4 Wildlife Crossings

A Wildlife Corridor Analysis was completed to evaluate the need to provide wildlife crossings. The findings of this evaluation can be found in a Technical Memorandum titled *Wildlife Corridor Analysis-Tier Two Illiana Corridor Study (2013).* The following summarizes the results of this analysis. The project team completed a preliminary review of streams and associated riparian areas crossed by the Illiana Corridor to assess their potential functions. The evaluation also took into account the regional green infrastructure network main goals identified by the Chicago Wilderness Alliance, in collaboration with the Chicago Metropolitan Agency for Planning (CMAP). Those goals include:

1. Conserve environmental quality strategically by protecting the most critical natural areas and conserving connectivity between them while acknowledging the need for development, and
2. Identify areas to protect based partly on the benefits they provide to people, such as flood storage, air emissions reduction, and water quality improvements.

In addition, the Illiana Corridor lies partially within the Kankakee Sands Conservation Opportunity Area (COA), which includes Midewin National Tallgrass Prairie and Goose Lake Prairie. The Illinois' Wildlife Action Plan includes an initial set of COAs that are priority areas for conserving Illinois' Species in Greatest Need of Conservation (SGNC). The riparian areas in the Illinois portion of the Illiana Corridor are a component of the Kankakee Sands COA.

The following data were evaluated for the stream and associated riparian areas as well as large wetland complexes crossed by the alternatives within the Corridor:

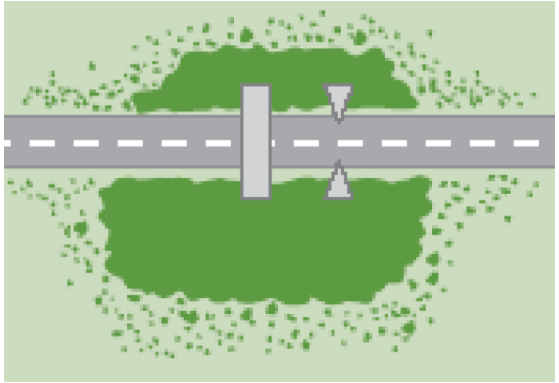
- Community type (i.e., woodland, prairie, savanna, wetland, etc.)
- Sites with Threatened and Endangered Species, Species of Concern, and Critical Habitat for listed species.
- Sites with Outstanding Remnants of Plant Communities (Floristic Inventories, if available)
- Areas adjacent to or connecting designated parks, forest preserves, etc.
- Future land use plans, local and regional
- Delineated wetlands in the Corridor
- Watershed plans, local and regional
- High resolution aerial photography (2012) of the Illiana Corridor for review of surface water features
- Historic aerial photography from Google Earth© and the University of Illinois, Illinois Geospatial Data Clearinghouse for various years, going back as far as the 1937-1947 Historic Aerial Photograph series.

The evaluation considered all stream/river crossings which number approximately 40 based on the current design. Of these, approximately 50 percent are proposed as bridges and the remainder proposed as culverts; however, the focus of this study is on those water courses which present the greatest opportunity to maintain or enhance wildlife passage in the study area.

Based on the analysis completed, the following 12 locations were recommended to include wildlife crossings.

- Illinois
  - Kankakee River
  - Unnamed Tributary of the Kankakee River
  - Forked Creek
  - South Branch Forked Creek
  - Black Walnut Creek
  - Pike Creek
- Indiana
  - Unnamed Tributary of West Creek #2
  - McConnell Ditch
  - Unnamed Tributary of McConnell Ditch
  - Cedar Creek
  - Wetland b-w31-pem (Tributary to Cedar Creek)

Figure 1-6. Illustrative Wildlife Crossing Overview



Source: USDOT FHWA Wildlife Crossing Structure Handbook, March 2011

AN ASSESSMENT OF THE HERPETOFAUNAL SPECIES ASSOCIATED WITH THE IDOT ILLIANA EXPRESSWAY PROJECT CORRIDOR IN WILL COUNTY, ILLINOIS

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INTRODUCTION

In a transmittal dated 27 March 2012, Susan Dees Hargrove of the Illinois Department of Transportation (IDOT) Bureau of Design and Environment requested herpetological surveys for threatened and endangered amphibian and reptile species potentially associated with the IDOT Illiana Expressway project corridor. The tasking included an email from Charles Perino (IDOT) specifically requesting herpetological surveys in Will County within the bounds of the corridor for: the Mudpuppy, *Nectutus maculosus*, in the Kankakee River, Blanding's Turtle, *Emydoidea blandingii*, and the Eastern Massasauga, *Sistrurus c. catenatus*, from I-55 to the east side of the Kankakee River. It was noted in that email that a full herpetological survey of the entire project corridor was not warranted. An addendum to the original project tasking from IDOT (Sequence 16651B dated 21 February 2013), requested herpetological surveys, as per the original tasking, to be conducted in additional addendum areas outside of the original scope of the herpetological tasking with a due date of 01 May 2013. Results of both the original tasking and the addendum are presented together below and are referred to as the IDOT Illiana Expressway project corridor.

MATERIALS AND METHODS

Database Review

A search of the Illinois Natural Heritage Database maintained by the Illinois Department of Natural Resources (IDNR) was queried for Element Occurrence Records (EOR) of threatened and endangered amphibians and reptiles within one mile of the IDOT Illiana Expressway project corridor. Four EORs of three species occur adjacent to or in the proposed Illiana Express project corridor. These results were plotted onto satellite images of the project corridor (**Figure 1**). All EORs were within the area from I-55 to the North/East shore of the Kankakee River. There is one record of a Blanding's Turtle from 2010 in the Kankakee River along the northern boundary of the IDOT Illiana Expressway project corridor (EOID 6498). There is a second record of a Blanding's Turtle (EOID 5139) from 2008 from Hitts-Siding Nature Preserve which shares a border with the proposed southern project corridor boundary along West Strip Mine Road from North Washington St. to Illinois Route 53. There is also a 2011 record for the state threatened Ornate Box Turtle from Hitts-Siding Nature Preserve (EOID 8672). Thus, surveys were also conducted for Ornate Box Turtles and their habitat. In 2010, a Mudpuppy (EOID 8418) was captured just south of the project corridor in the Kankakee River (**Figure 2**). The nearest historical records for the Eastern Massasauga Rattlesnake in the vicinity of the IDOT Illiana Expressway project corridor come from Goodenow Grove Nature Preserve, located approximately 5 miles north of corridor at Beecher, Illinois. However, there have been no live records from Goodenow Grove since 1996 despite 622 search hours at the site. One road killed individual was found in 1999, but the population is feared to be extirpated (Dreslik et al 2006). An examination of satellite images of the IDOT Illiana Expressway project corridor did not indicate any prime habitat for Eastern Massasauga Rattlesnakes, or any other endangered or threatened species East of Wilmington, Illinois. Thus, the original herpetological tasking of the IDOT Illiana Expressway project corridor from I-55 to the North/East shore of the Kankakee River was the area in which the majority of sampling occurred.

Natural History of Threatened and Endangered Amphibians and Reptiles from the proposed IDOT Illiana Expressway Project Corridor

Blanding's Turtle, *Emydoidea blandingii*

The Blanding's Turtle is distinguishable from other North American turtle species by the presence of a hinged plastron coupled with a bright yellow chin and throat (Ernst et al. 1994). Blanding's Turtles are long lived, with wild-caught individuals over 77 years of age having been documented in the field (Congdon et al. 2001). Females typically mature between 14 and 20 years of age (Congdon et al. 1983; Ross 1989). Blanding's turtles in northern Illinois are active from late March through October (Rowe and Moll 1991; Kuhns et al. 2007) with the greatest trapping success occurring from May through mid-July (Benda et al. 2007). Females lay only one clutch of eggs per year but may not nest annually. Throughout

their range, *E. blandingii* occupy eutrophic habitats with clear water and abundant aquatic vegetation with adjacent uplands available for nesting (Ernst et al. 1994). Within Illinois, *E. blandingii* was historically present in the extensive marsh systems of the northern half of the state (Kennicott 1855). Females can travel considerable distances (1620 m) from their activity areas to nest (Congdon et al. 1983; Ross and Anderson 1990; Joyal et al. 2001; Kuhns et al. 2007). Nests of up to 19 eggs are laid in sand or sandy loam soils with good drainage and low canopy cover **(**Ross and Anderson 1990**;** Kuhns et al. 2007). The Blanding's Turtle is considered endangered in Illinois (Illinois Endangered Species Protection Board 2011; Mankowski 2010, 2012).

Mudpuppy, *Necturus maculosus*

The Mudpuppy is a large (up to 19" in length, but averages 12"), fully aquatic salamander distinguished from other salamanders in Illinois by having four toes on the hind feet and large bushy gills. A dark line that bisects the eye terminates at the external gills and the species often has dark blotches on its sides and tail (Petranka 1998). Their range extends from southern Quebec to northern Alabama, Mississippi, and Georgia. They inhabit a multitude of habitats including muddy canals, large fast-flowing rivers, and large cool water lakes (Petranka 1998). In Illinois, they primarily inhabit lakes, ponds and large creeks with clear water, but can survive in alternative habitat if rocky areas are available for reproduction (Phillips et al. 1999). The species is most active in October and November when breeding occurs, although a second breeding bout may occur in late winter and early spring. Females deposit eggs in nests under rocks, logs and other cover objects in May and June (Petranka 1998). Eggs hatch in one to two months and the larvae do not reach reproductive age for five years. Mudpuppies are predatory and will consume what will fit in their mouth. Prey consists of mostly invertebrates (annelids, insects, mollusks and crayfish) but may also include amphibians and fish. Mudpuppies are primarily nocturnal. During the day they shelter under rocks, logs, bank undercuts, and other cover objects. They primarily forage for food at night but in weedy and muddy habitats they may be active during the day (Petranka 1998). Mudpuppies appear to be most active at cooler water temperatures with most captures occurring at water temperatures around 40° Fahrenheit (Chellman and Parrish 2010). The Mudpuppy is listed as a threatened species in the state of Illinois due to a decrease in recent observations of the species in the state (Illinois Endangered Species Protection Board 2011; Mankowski 2010, 2012). Further, the Mudpuppy is the only known glochidial host of the salamander mussel, *Simpsonaias ambigua* (Mollusca, Unionidae). The salamander mussel is an endangered species in Illinois and a candidate for federal listing by the United States Fish and Wildlife Service and conserving *N. maculosus* may aid in the conservation of *S. ambigua* (Mankowski 2010).

Eastern Massasauga Rattlesnake, *Sistrurus catenatus*

The Eastern Massasauga Rattlesnake, *Sistrurus catenatus*, is a medium sized (to 100 cm) grey to light brown rattlesnake. It is a pit viper distinguished from non-venomous snakes by the presence of a facial pit between the nostril and eye, the presence of a rattle, and an elliptical pupil. The genus *Sistrurus* is distinguished from other rattlesnakes by having nine large plates (scales) on the head; other North American genera of rattlesnakes have numerous smaller scales on the head (Ernst 1992; Ernst and Ernst 2003). The Eastern Massasauga is distributed from southern Ontario, central New York and western Pennsylvania, west to Iowa and eastern Missouri, and south to south central Illinois (Ernst 1992). Within Illinois, it historically occurred over the northern two-thirds of the state (Smith 1961). However, Eastern Massasauga Rattlesnakes have been recorded from only five counties in the last 20 years (Phillips et al. 1999) and are now believed to occur at most only four sites in Illinois. In the Midwest, the Eastern Massasauga Rattlesnake is found in habitats such as marshes, bogs, sedge meadows, and xeric to mesic grasslands. In Indiana, they occupy rank grasslands or undergrowth in marshes, fens, or lake margins, dry prairie, hay or grain fields, second growth swamp forest and areas adjacent to the above (Minton 2001). In Missouri, *S. c. catenatus* are found in or in proximity to natural wet prairies and marsh habitats (Johnson 1997). Breckenridge (1944) gives their habitat in Minnesota as swampy bottomlands. After emergence *S. c. catenatus* typically spend the spring in low moist areas, where they retreat into crayfish burrows during

periods of cold temperatures. During the summer months, they move to drier upland habitats, and then return to low lying areas again in the autumn (Bielema 1973; Mauger and Wilson 2000; Wilson and Mauger 2000). In Illinois, Eastern Massasauga Rattlesnakes over-winter in low moist areas with an abundance of crayfish burrows (Bielema 1973; Mauger and Wilson 2000). Wright (1941) states that populations in close proximity to the Des Plaines River over-winter in rock crevices along the bank. The Eastern Massasauga is listed as an endangered species in Illinois (Illinois Endangered Species Protection Board 2011; Mankowski 2010, 2012) and is a candidate for listing under the federal endangered species act (USFWS 1999).

Ornate Box Turtle, *Terrapene ornata*

The Ornate Box Turtle is distinguished from other turtles by its hinged plastron patterned with yellow lines on dark scutes, and non-keeled plastron (Legler 1960a, Phillips et al. 1999). It is distributed in the Prairie Peninsula of Illinois, the Great Plains, and southwestern States (Ernst et al., 1994; Dodd, 2001). The Ornate Box Turtle is considered a prairie species that also utilizes other open canopy habitats such as savanna, pasture, and open grasslands and has a proclivity for sandy soils that facilitate burrowing (Legler 1960a, Collins 1974, Doroff and Keith 1990, Ernst et al. 1994, Degenhardt et al. 1996, Minton 2001, Kuhns 2004). Individuals in Wisconsin were found disproportionately on remnant prairie areas with deep sandy soil, avoiding agricultural areas (Doroff and Keith 1990). In Indiana, they are known from open sandy areas, meadows, and sparse woodlands (Minton 2001). Females lay clutches of 4-6 eggs in June. Their active season is from mid-April through October in Illinois (Phillips et al. 1999). The Ornate Box Turtle is considered threatened in Illinois (Illinois Endangered Species Protection Board 2011; Mankowski 2010, 2012).

Survey site selection

Site surveys occurred in those areas specifically tasked in the 2012 missive, in areas within or near the project corridor where site visits indicated the potential for species occurrence, and at one location where aquatic sampling of fishes and mussels indicated that suitable habitat for the Mudpuppy may occur (ILLIANAX-NM4). Additionally, one site outside of the corridor where a state threatened species was known to occur was also sampled to determine whether sampling protocols and traps were sufficient for successfully documenting the species.

Survey protocols

The following survey protocols were implemented in habitats deemed suitable based upon aerial images and on the ground examination of habitats.

Blanding's Turtles, *Emydoidea blandingii* (and other aquatic turtle species) were sampled using two sizes of baited hoop traps (0.5m D x 1m L; and 0.3m D x 0.5m L) with double throats (Legler, 1960b). All hoops were placed such that at least 2.5 inches of the trap was above the surface of the water to ensure captured turtles had access to air. Traps were tied to emergent vegetation to ensure that captured turtles did not roll traps into deeper water and drown. Traps were placed parallel to the shoreline or parallel to potential basking sites. Traps were baited with sardines canned in spring water or oil and were checked daily. Upon initial placement of traps, GPS coordinates were taken of the wetlands in which they were placed. Effort was recorded in trap hours (i.e., number of traps multiplied by the number of hours the traps were deployed). Additionally, passive Visual Encounter Surveys were conducted daily around and in the wetlands where traps were deployed. This effort was not recorded but a general area of survey can be gleaned by examining the locations of traps in **Figure 1**.

Mudpuppies, *Necturus maculosus***,** were sampled for using both passive and active sampling techniques based upon recommended methods detailed in the USGS Managers Monitoring Manual (U.S. Geological Survey – website accessed 20 September 2012). Since Mudpuppies inhabit large aquatic systems, sampling methods were adaptive relative to the conditions of the Kankakee River. Mudpuppies

are predominately nocturnal however there are techniques available that allow for sampling during the day. A combination of passive and active sampling techniques was utilized for sampling Mudpuppies in the Kankakee River and it tributary streams. Passive sampling was conducted by setting minnow and crayfish traps, baited with seafood flavored canned cat food. Traps were submerged upstream of potential cover objects including logs, boulders, and rip rapped areas and checked daily. Effort was recorded in trap hours. Active sampling was conducted with dip nets. For this method, as one researcher lifted large rocks in the water body, a second researcher quickly scanned the area and, using a dip net, swept the area under the rock for any animals that might have been residing underneath the object. For this method, effort was recorded as the linear distance sampled. Encountered individuals were photographed, and a small section of tail was taken for accessioning into the INHS non-vouchered tissue collection.

Eastern Massasauga, *Sistrurus catenatus* and Ornate Box Turtle, *Terrapene ornata* were sampled using Visual Encounter Surveys (VES). This is the primary method of sampling for terrestrial amphibians and reptiles over discrete time periods and involves searching appropriate habitat and turning cover objects such as logs, rocks, and debris, while scanning open habitat areas for target organisms (Heyer et al. 1994). Effort was recorded in minutes (i.e., number of researchers multiplied by the number of minutes spent searching).

RESULTS

Turtle trapping occurred from 22 through 25 May 2012 on three sites where suitable habitat for Blanding's Turtles was present (**Figure 1**). Sixteen traps were set for 1046 trap hours (**Table 1**). I captured one Snapping Turtle, *Chelydra serpentina;* seven Painted Turtles, *Chrysemys picta*; and one Northern Water Snake, *Nerodia sipedon*. No Blanding's Turtles were captured in traps (**Table 1**).

Table 1. Locations, dates, effort and results of turtle trapping in the IDOT Illiana Expressway project corridor from I-55 to the Kankakee River near Wilmington in Will County, Illinois. Trapping was conducted from 22 to 25 May 2012 by A.R. Kuhns.

Site	Dates/Duration	Latitude	Longitude	Trap Size	Effort (hrs)	Species Captured
ILLIANAX-TT1	22-24 May 2012	41.31602	-88.1599	18"	50	*C. serpentina* (1)
ILLIANAX-TT2	22-25 May 2012	41.30833	-88.1832	12" & 18"	960	*C. picta* (6); *N. sipedon* (1)
ILLIANAX-TT3	23-25 May 2012	41.31335	-88.1767	12"	36	*C. picta* (1)
Total Effort					1046	

Mudpuppy trapping occurred/was attempted on four separate occasions: 09 – 12 October 2012, 29 – 30 January 2013, and 11 and 17 April 2013. Four sites were sampled with traps for 852 hours of trap effort (**Figure 2**). Some trapping periods resulted in zero sum effort because unexpected storms increased river and tributary flow resulting in traps washing away or becoming unreachable (**Figure 3)**. Trapping dates planned for the weeks of 11 and 17 April 2013 were cancelled due to rain events and subsequent increases in discharge and depth in the Kankakee River at Wilmington that made conditions unsafe and unfavorable for sampling (**Figure 4**). Trapping resulted in the capture of one *N. maculosus* approximately 4.5 miles south of the corridor (**Table 2**). The EOR record for this observation can be found in **Appendix 1**. Additionally, dip netting and seining was conducted at three sites, ILLIANAX-NM1, ILLIANAX-NM2, ILLIANAX-NM3 (**Table 2**).

Table 2. Trapping and VES survey (dipnetting) results of Mudpuppy surveys for the IDOT Illiana Expressway project corridor in Will County, Illinois. There are historical records for the Mudpuppy from both ILLIANAX-NM4 and ILLIANAX-NM5. Surveys were conducted by A.R. Kuhns over two visits to the project area.

Site	Site Name	Latitude	Longitude	VES Date	VES Extent	Trap Date	Trap Effort (hours)
ILLIANAX-NM1	Prairie Creek	41.34133	-88.18362	10/09/2012	750'	09 -12 Oct. 12	336
				---	---	29 – 30 Jan.13	>20*
ILLIANAX-NM2	Forked Creek-W	41.31368	-88.14850	10/09/2012	900'	---	
				1/29/2013	900'	29 – 30 Jan.13	*
ILLIANAX-NM3	Forked Creek-E	41.32285	-87.97810	10/09/2012	1700'	----	
ILLIANAX-NM4	Wilmington Dam	41.30168	-88.15033	---	N/A	29 – 30 Jan.13	*
ILLIANAX-NM5	Horse Creek ǂ	41.24571	-88.13112	---	N/A	09 -12 Oct. 12	516
Total Effort							872

* Two traps were set at each of these sites. A rainfall event the evening of 1/29/13 washed 5 of the six traps away. Only one trap was recovered the following day.

ǂ This site was sampled to test the efficacy of the trapping protocols. It is located approximately 4.5 miles upstream (south-southeast) of the IDOT Illiana Expressway project corridor. One Mudpuppy was captured at this site on 12 October 2012.

Visual Encounter Surveys were conducted in four locations for Ornate Box Turtles, Blanding's Turtles, and Eastern Massasauga Rattlesnakes (**Figure 1, Table 3**). Numerous frog, lizard, and turtle species were documented (Table 3). Although the target species were not observed during these surveys, three of the four sites (ILLIANAX-VES1, ILLIANAX-VES2, ILLIANAX-VES3) contained suitable habitat for both the Blanding's Turtle and Ornate Box Turtle. This assessment was verified on 24 October 2012 when INHS Wetlands Group Botanist Brian Wilm observed a Blanding's Turtle in a wetland in ILLIANAX-VES2 (**Figure 1**). An EOR for this record is included in **Appendix 1**.

Table 3. Visual Encounter Survey results for terrestrial areas within the IDOT Illiana Expressway project corridor in Will County, Illinois. Surveys were conducted by A.R. Kuhns from 22 to 24 May 2012.

Site	Site Name	Date	Effort (min)	Species Encountered
ILLIANAX-VES1	Dog Training	5/23/2012	105	*L. catesbiana* (3 adult, 100+ tadpoles), L. clamitans (3), L. pipiens (2), C. picta (5)
ILLIANAX-VES2	Widow Sports	5/22/2012	50	*Lithobates catesbiana* (1)
		5/23/2012	40	*L. clamitans* (2)
ILLIANAX-VES3	Line Cut	5/23/2012	110	*Cnemidophoros sexlineatus* (10), *L. clamitans* (2)
		5/24/2012	90	*Cnemidophorus sexlinatus* (5)
ILLIANAX-VES4	Redman	5/24/2012	35	*L. pipiens* (1), N. sipedon (1)
Total Effort			430	

DISCUSSION/SUMMARY

One observation of a Blanding's Turtle occurred within the IDOT Illiana Expressway project corridor (**Figure 1**, **Appendix 1**). Suitable habitat was present for Blanding's Turtles at three sites within the project corridor. Site ILLIANAX-VES1 (**Plate 1**), ILLIANAX-VES2 (**Plate 2**) and ILLIANAX-VES3 (**Plate 3**) all had suitable habitat consisting of well-vegetated shallow water wetlands and adjacent uplands with sandy soil for nesting. Because Blanding's Turtles can have home ranges that exceed several hectares in size and individuals may move over a kilometer to nest, it is possible that the same individuals may use all three of these sites. Suitable habitat for Ornate Box Turtles is similar to the upland habitat needed by Blanding's Turtles. Therefore, although not documented during this survey, suitable habitat is also present for the state threatened Ornate Box Turtle at the same three sites. These sites will be re-visited for Blanding's Turtles and Ornate Box Turtles in May/early June 2013 and a supplemental report will be prepared detailing the results of the sampling.

The fourth site where VES surveys were conducted, ILLIANAX-VES4 (**Plate 4**), did not appear suitable for any of the four threatened or endangered herptiles. There were no records for the Eastern Massasauga Rattlesnake in the vicinity of the IDOT Illiana Expressway project corridor and no habitat was found during examination of satellite images or site visits that would indicate that the species is present in the project corridor.

Suitable habitat for the Mudpuppy appears to be present in the Kankakee River but no individuals were encountered during visual encounter surveys within the project corridor. Suitable habitat was apparent upstream of the project corridor at ILLIANAX-NM1 (**Plate 5**) and downstream at the known EOR location ILLIANAX-NM4 (**Plate 6**). Conditions of the various site visits made sampling of the river itself difficult. During the sampling period of 9-12 October, water levels were suitable for sampling but an abundance of algae (**Plate 6**) prevented trapping of the main channel. Likewise, active sampling by flipping large rocks and dip-netting were hindered by the algal mats which precluded visibility of suitable rocks to flip, and made for an easy escape for anything that might have been residing underneath. A rain event on the first night of the second visit on 29 January 2013 resulted in the loss of all but one traps and unsafe conditions for sampling. Subsequent revisits planned for April were cancelled due to unsafe conditions on the Kankakee River (**Figure 4**). Mudpuppies will be sampled concurrently with the turtle surveys mentioned above and the results of those surveys will be reported in a supplemental report. One Mudpuppy was captured from Horse Creek approximately 4.5 miles south of the project corridor (**Figure 2**, **Plate 7**, **Appendix I**) indicating that the sampling method was effective in detecting the species under ideal seasonal and environmental conditions.

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Figure 1. Locations and boundaries of known threatened and endangered reptiles (EOR), trap "event" locations for Blanding's Turtles, and areas of visual encounter surveys (VES) plotted onto an aerial view of the IDOT Illiana Expressway project corridor in the vicinity of Wilmington, Will County, Illinois. Also, included is the location of the 24 October 2012 Blanding's Turtle observation. This aerial view captured from Acme Mapper 2.0 (http://mapper.acme.com/).

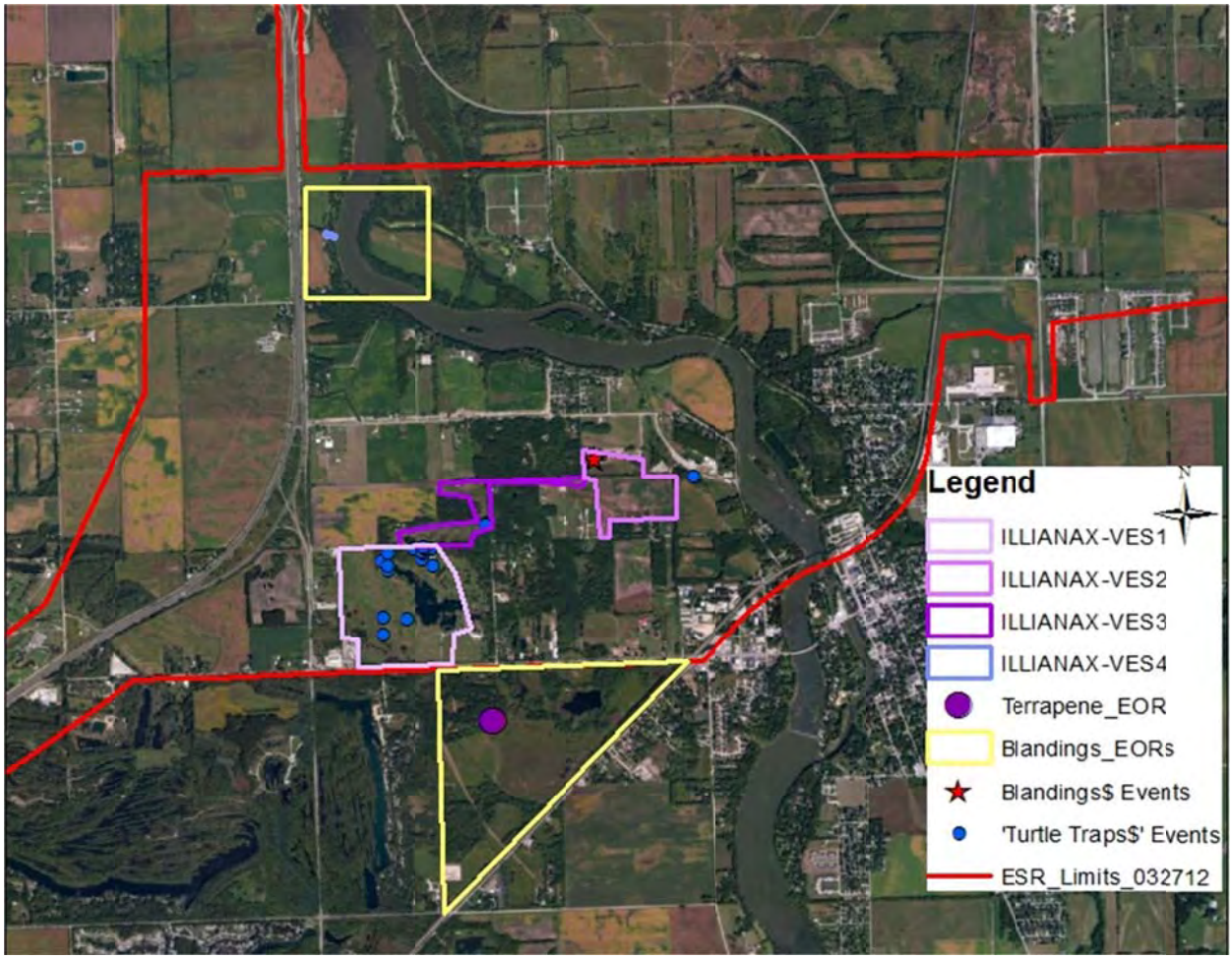


Figure 2. Locations of Mudpuppy sampling (trapping and visual encounter surveys) relative to the location of the IDOT Illiana Expressway project corridor near Wilmington in Will County, Illinois. Sites Illianax-NM4 and Illianax-NM5 are both known localities of Mudpuppies.

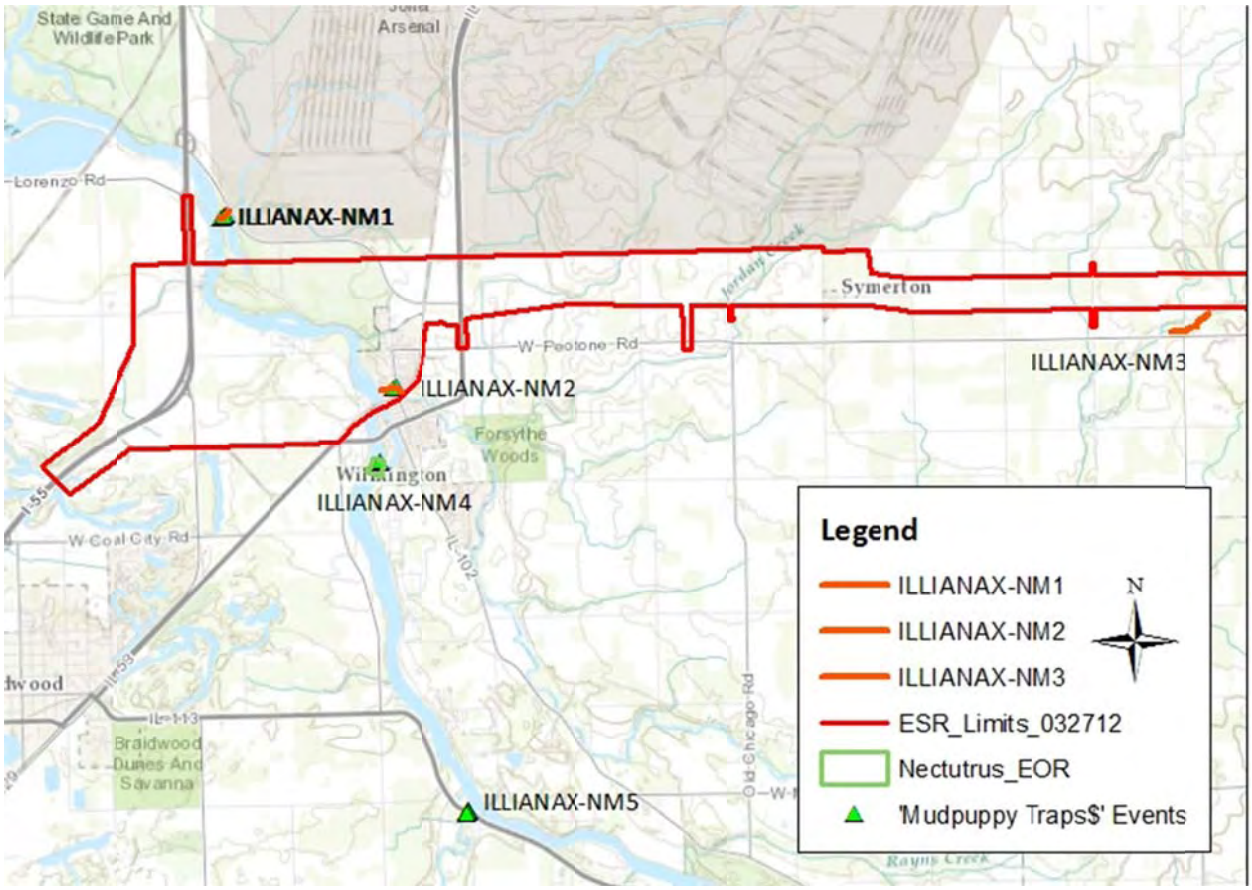
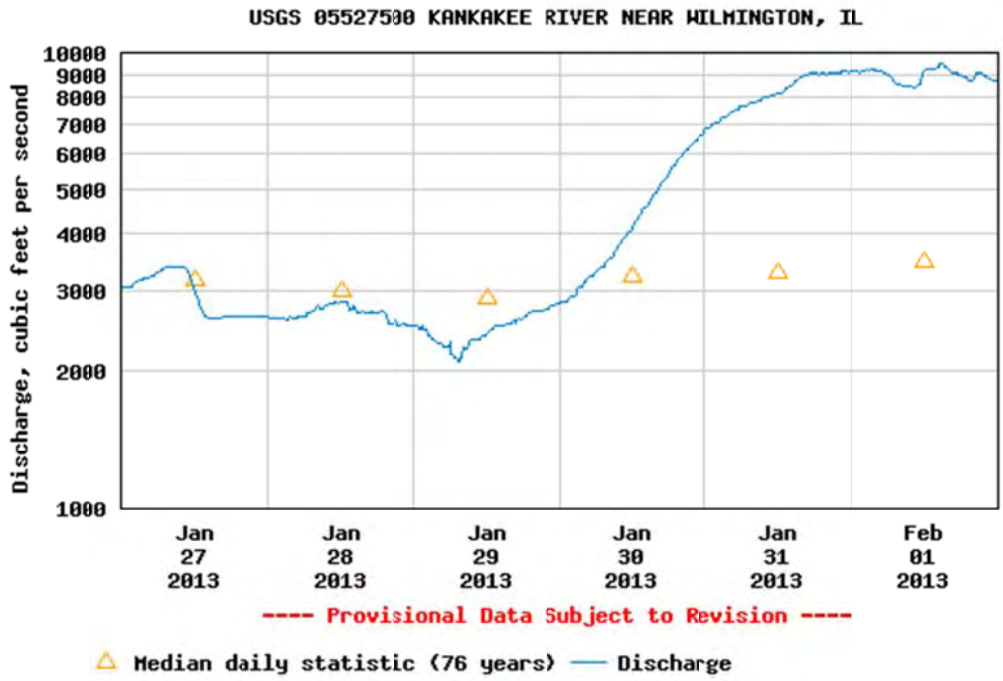


Figure 3. Graphs depicting the changes to both discharge (**A**) and gauge height (**B**) of the Kankakee River near Wilmington, Will County, Illinois from 27 January through 01 February 2013. These conditions resulted in the loss of over 80% of traps that were set on 29 January. Graphs generated at [www.waterdata.usgs.gov] on 24 April 2013 using data taken from station USGS 05527500 Kankakee River near Wilmington, IL.

A



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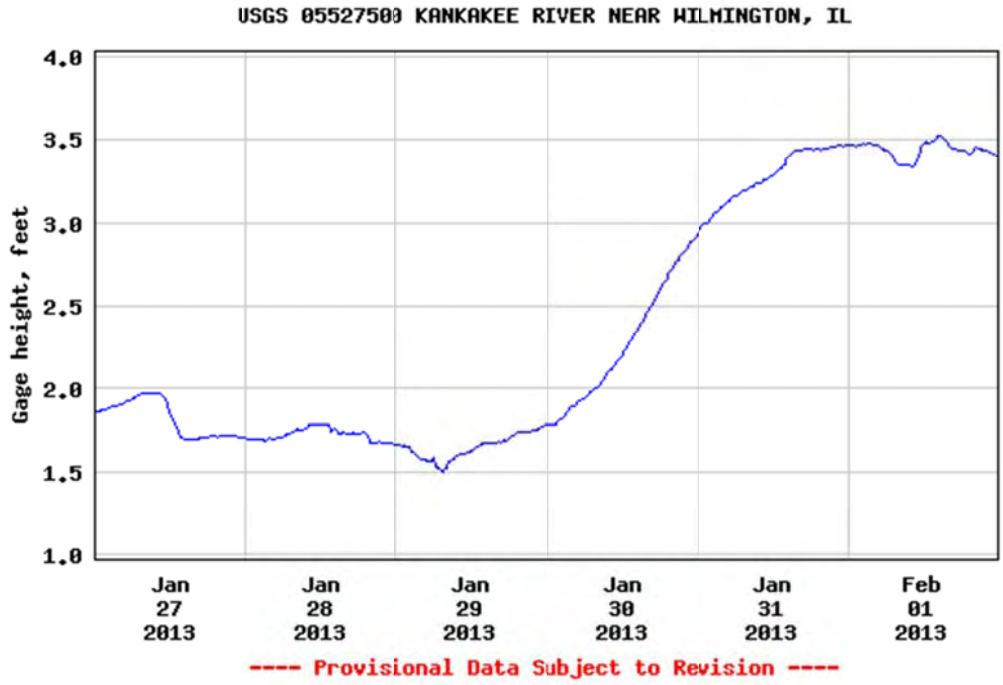
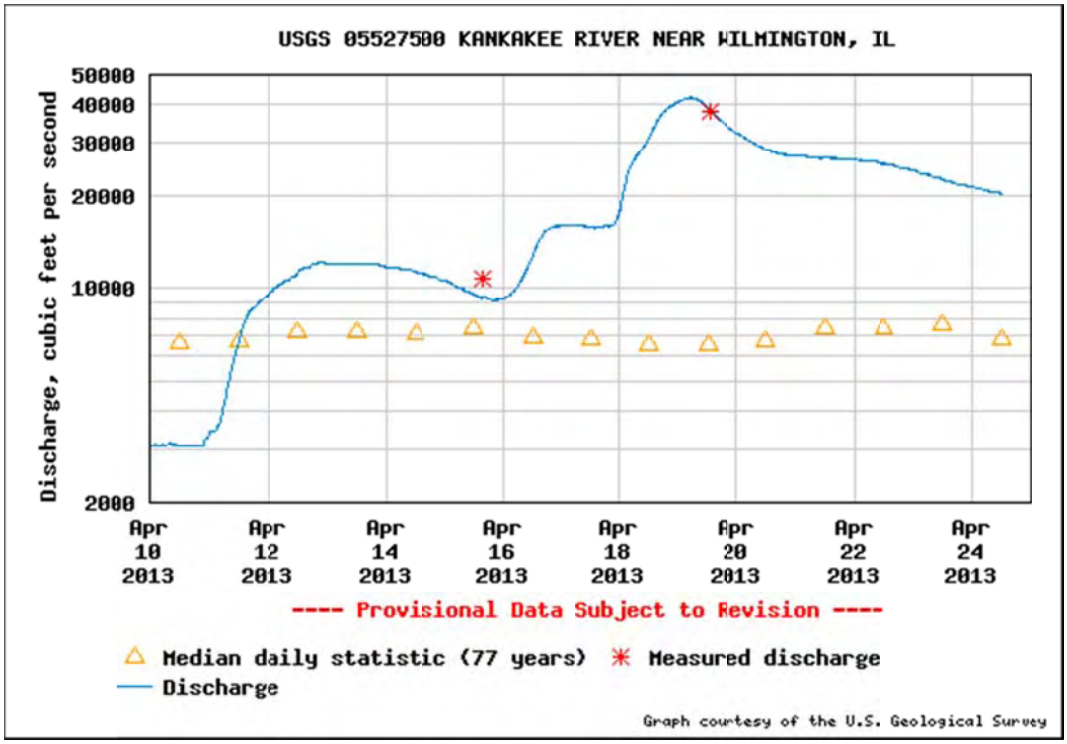


Figure 4. Graphs depicting the changes to both discharge (**A**) and gauge height (**B**) of the Kankakee River near Wilmington, Will County, Illinois from 10 through 24 April 2013.These conditions made sampling unfeasible and unsafe for trapping Mudpuppies. Graphs generated at [www.waterdata.usgs.gov] on 24 April 2013 using data taken from station USGS 05527500 Kankakee River near Wilmington, IL.

A



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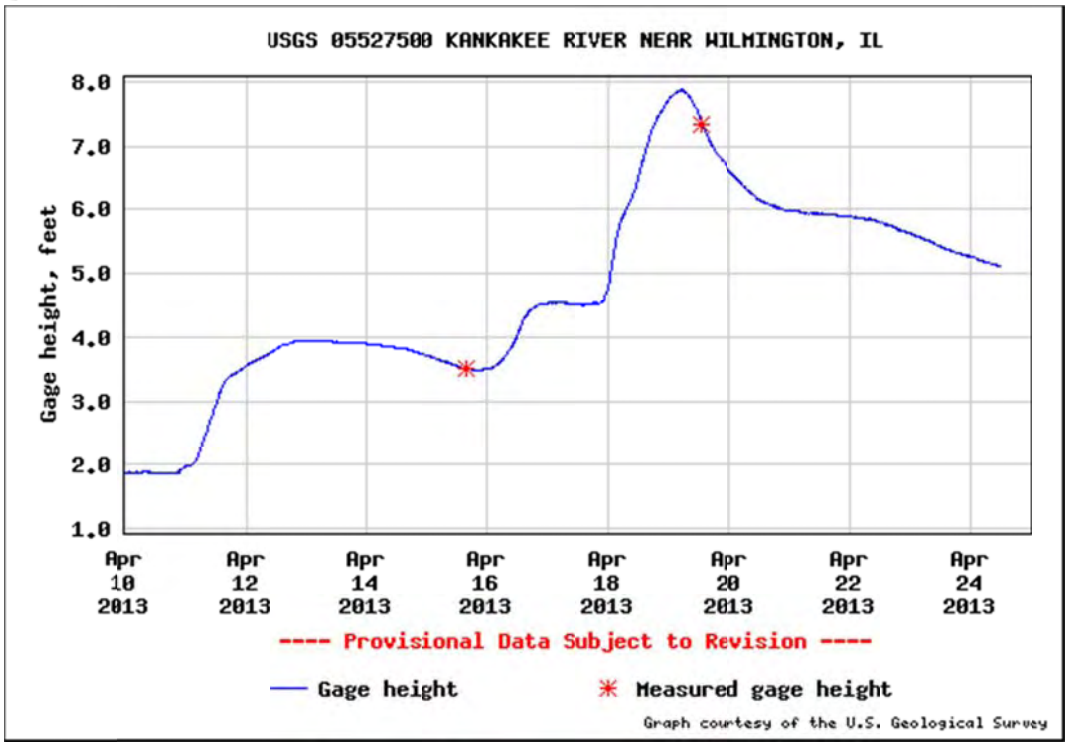

Plate 1. Images of representative habitats of ILLIANAX-VES1, examined by Visual Encounter Surveys for IDOT Illiana Expressway project corridor in Will County, Illinois. Images taken by A.R. Kuhns from 22 to 25 May 2012. In addition to large structurally modified ponds, the site consisted of shallow, well vegetated wetlands with abundant sandy soiled uplands suitable for Blanding's Turtles.

Plate 2. Image of representative habitats of ILLIANAX-VES2, examined by Visual Encounter Surveys for the IDOT Illiana Expressway project corridor in Will County, Illinois. Image taken by A.R. Kuhns from 22 to 25 May 2012. This site consisted of predominantly old field habitat that has been restored to grasslands and is suitable for Ornate Box Turtles. Not pictured is a wetland on the north part of the survey area where a Blanding's Turtle was documented on 24 October 2012 by INHS Wetlands Biologist Brian Wilm.

Plate 3. Images of representative habitats of ILLIANAX-VES3, examined by Visual Encounter Surveys for the IDOT Illiana Expressway project corridor in Will County, Illinois. Images taken by A.R. Kuhns from 22 to 25 May 2012. This site consisted of shallow, well-vegetated wetlands and sparsely-vegetated, sandy uplands suitable for both Blanding's Turtles and Ornate Box Turtles.

Plate 4. Image of representative habitat of ILLIANAX-VES4, examined by Visual Encounter Surveys for the IDOT Illiana Expressway project corridor in Will County, Illinois. Image taken by A.R. Kuhns from 22 to 25 May 2012. This site was a waterway flowing through a field and residential area before dumping into the Kankakee River. This site was not suitable for Mudpuppies or other T&E amphibian or reptile species.

Plate 5. Image of representative habitats of ILLIANAX-NM1, sampled by dip-nets and amphibian traps for the IDOT Illiana Expressway project corridor in Will County, Illinois. Image taken by A.R. Kuhns 09 October 2012. This site appears suitable for Mudpuppies with an abundance of refugia available for them. Note the plethora of aquatic string algae that covered the surface and substrate of the Kankakee River on 09 October 2012 that prevented trapping. A second visit on 29 January 2013 resulted in the loss of all traps due to a rainfall event that increased gauge height by >1' and made the river unsafe to wade.

Plate 6. Image of representative habitats of ILLIANAX-NM4, for the IDOT Illiana Expressway project corridor in Will County, Illinois. Image taken by A.R. Kuhns 09 October 2012. This site is just north of the corridor and appears suitable for Mudpuppies with an abundance of refugia available for them. A second visit on 29 January 2013 resulted in the loss of all traps due to a rainfall event that increased gauge height by >1' and made the river unsafe to wade.

Plate 7. Adult Mudpuppy, *Necturus maculosus*, captured from a hoop trap baited with seafood flavored canned cat food at ILLIANAX-NM5 approximately 4.5 miles south of the IDOT Illiana Expressway project corridor in Will County, Illinois, on 12 October 2012. Image taken by A.R. Kuhns on 12 October 2012.

APPENDIX 1

Element Occurrence Records (EOR) of endangered and threatened amphibians and reptiles documented during INHS surveys associated with the IDOT Illinois-Indiana (ILLIANA) Expressway project corridor in Will County, Illinois during 2012.

Illinois Natural Heritage Database
Endangered /Threatened Species Occurrence and Sighting Report Form

Name of Species:	Blanding's Turtle, Emydoidea blandingii	**Date Observed:**	24 October 2012

New Sighting	X	or **Update**		Entire extent of occurrence is:		**known** OR	X	**not known**

Naturally Occurring	X	or	**Introduced** Location			**When?**	unknown	**From Where?**	unknown

Location: (For more accurate mapping, please provide a map showing the exact location)
map included

County:	Will	**Latitude**	41.31672	**Longitude**	-88.16777

Direction from Nearest Landmark: 2.0 km WxNW of Wilmington, IL, South of the Kankakee River

Natural Division and Section:

Legal Description:	Township	33N	Range	9E	Section	26	Quad name	Wilmington

INAI Site Name:		**Survey Site Name (alias)**	Jug Spring

Observations : (evidence of breeding or # of ♂,♀& juvenile animals or # fruiting/flowering/seedling plants, etc.):
fruiting/flowering/seedling plants

Identified by the bright yellow chin and neck which were readily apparent.

Description of Area: It was in an excavated pond/wetland complex (old gravel pit?)

Comments: One adult individual observed while conducting botanical surveys for the IDOT Illiana Express project.

Specimen/voucher #(s):		**Where deposited?**	

Name of Observer:	Brian Wilm						
Observer's Phone Number	(	217	)	244	-	2176	

Return to: Illinois Natural Heritage Database Program Manager, Illinois Department of Natural Resources,
One Natural Resources Way, Springfield IL 62702-1271

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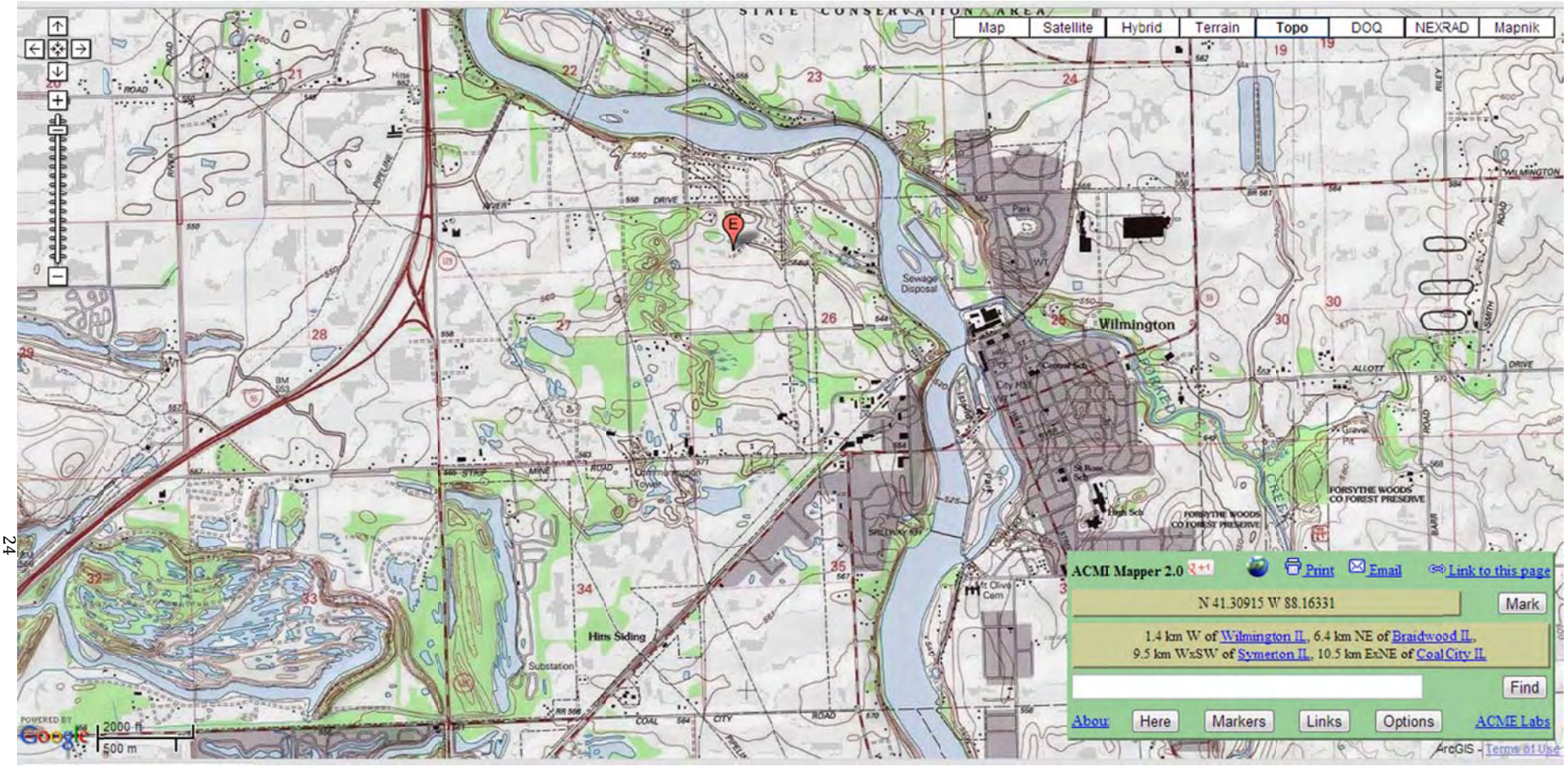
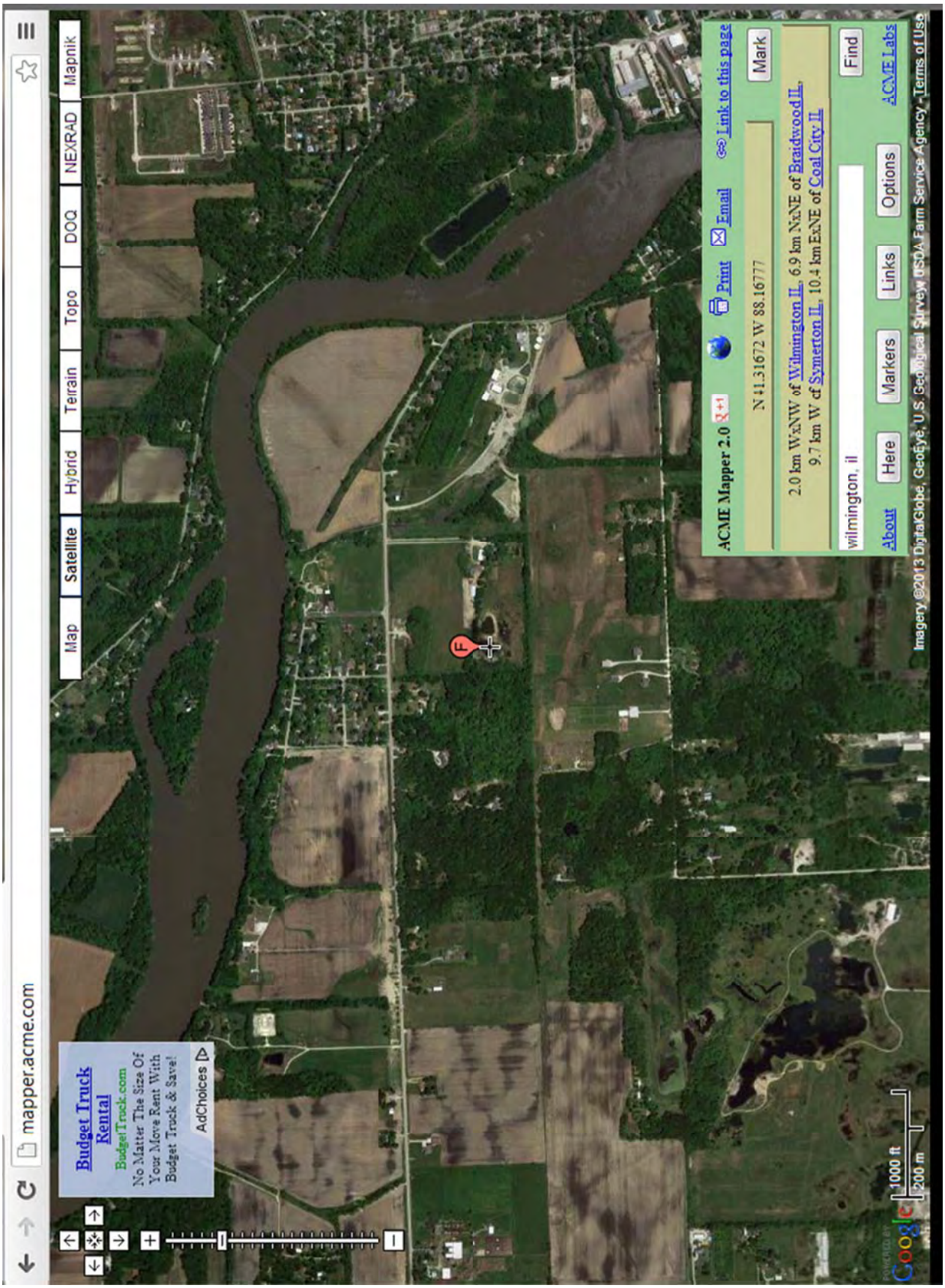
Blandings Turtle EOR location map (E) & aerial (F).

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Illinois Natural Heritage Database
Endangered /Threatened Species Occurrence and Sighting Report Form

Name of Species:	Necturus maculosus (Mudpuppy)	**Date Observed:**	10/12/12

New Sighting		or **Update**	X	Entire extent of occurrence is:		**known** OR		**not known**

Naturally Occurring	X	or	**Introduced** Location			**When?**		**From Where?**	

Location: (For more accurate mapping, please provide a map showing the exact location)
(coordinates are within 5 meter accuracy)

County:	Will	**Latitude**	41.24571	**Longitude**	-88.13112

Direction from Nearest Landmark:	Horse Creek- 5 meters N of US 113 Bridge over Horse Cr. @Custer Park, IL

Natural Division and Section:								
Legal Description:	Township		Range		Section		Quad name	

INAI Site Name:		**Survey Site Name (alias)**	

Observations : (evidence of breeding or # of ♂,♀& juvenile animals or # fruiting/flowering/seedling plants, etc.): fruiting/flowering/seedling plants

One adult captured in minnow trap. I trapped north and south of the bridge with 6 traps for three nights.

Individual was captured on the third night. Trap was placed downstream from 1m X 1.5m rock

Description of Area:	Tributary that flows into the Kankakee River. Large rocks and cobble over a sandy substrate.

Comments:	this is an update to the 2004 record by Redmer and ???

Specimen/voucher #(s):	INHS FLN 7603 (tissue & photo)	**Where deposited?**	IL. Nat. Hist. Survey (photo & tissue

Name of Observer:	A.R. Kuhns, J.S. Tiemann

Observer's Phone Number	(	217	)	265	-	6707	

Return to: Illinois Natural Heritage Database Program Manager, Illinois Department of Natural Resources,
One Natural Resources Way, Springfield IL 62702-1271

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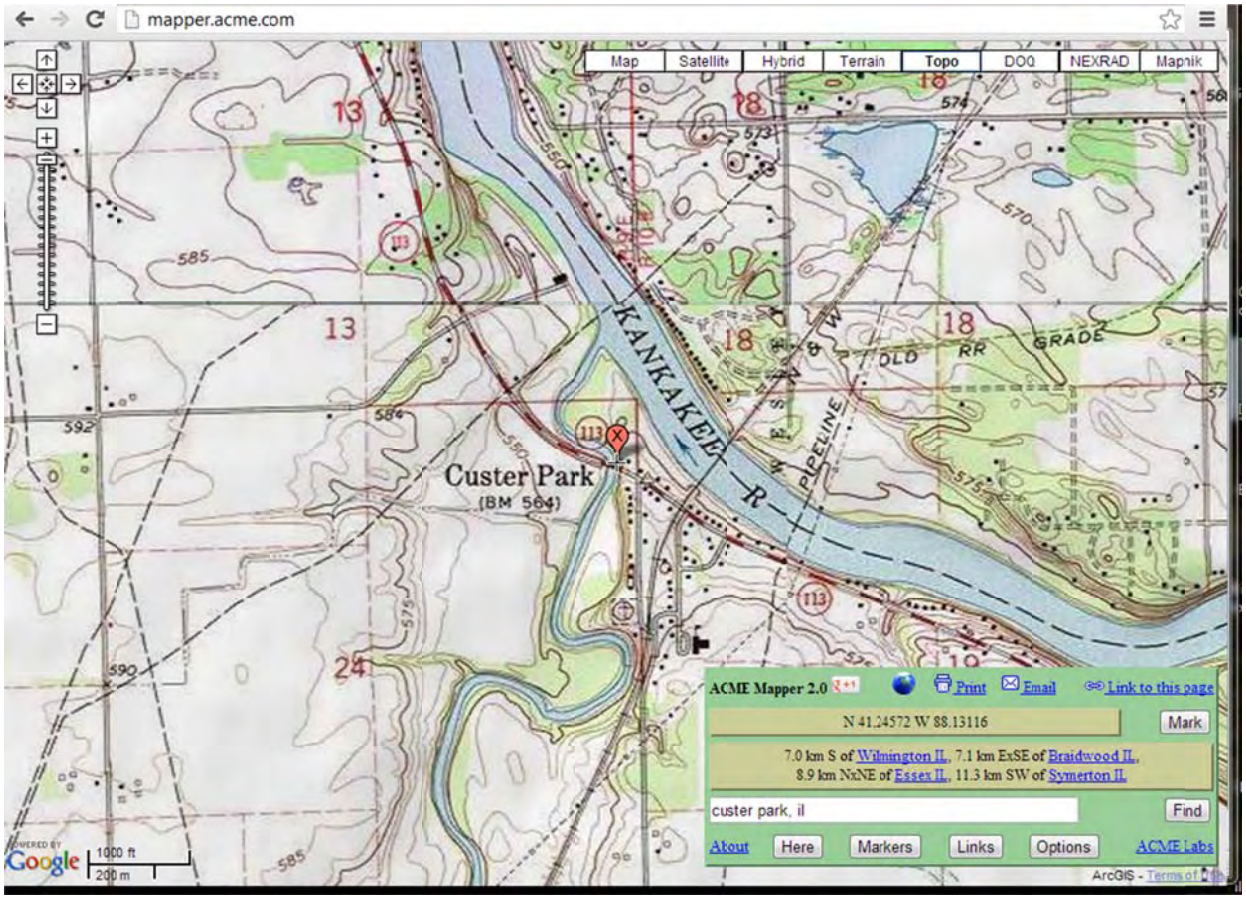
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Botanical Survey Report

Botanical Survey Results for the Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) in the IDOT Illiana Study Area (Addenda A, B and C) in Will County, Illinois

IDOT Sequence Numbers: 16651A, B and C

Prepared by:
Michael J. C. Murphy
and Janet L. Jarvis (Maps & GIS)

INHS/IDOT Statewide Biological Survey & Assessment Program
Report 2013(35)

July 2013

ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

N-583

INTRODUCTION

A request was received by the Illinois Natural History Survey (INHS) in May 2013 for botanical surveys to be conducted within the Illinois Department of Transportation (IDOT) Illiana Study Area, including Addenda A, B and C (**App. 1, Fig. 1A and 1B**), in Will County, Illinois. The specific request was for surveys to be conducted for *Platanthera leucophaea* (Nutt.) Lindl. (eastern prairie fringed orchid [EPFO]) within wetland and non-wetland habitats meeting specific criteria as designated by the United States Fish and Wildlife Service (USFWS). Eastern prairie fringed orchid is a species listed as federally threatened and within Illinois, state endangered (IESPB 2011).

METHODS

During June 2013, prior to commencement of 2013 EPFO surveys within the IDOT Illiana Study Area, INHS was provided a list by IDOT of 15 sites to be searched for EPFO. These sites were originally identified through INHS wetland surveys (Wilm et al. 2013) and botanical surveys (Murphy 2013) conducted in the 2012 Illiana Study Area (Addendum A) and/or the 2013 Illiana Addendum B Study Area. A coordinated review between USFWS and IDOT of data compiled by INHS scientists determined these 15 sites met USFWS search criteria for potential EPFO habitat (***see*** **App. 2, Table 1**). Search criteria for appropriate prairie and wetland habitats, as outlined by the USFWS, are as follows: 1) sites with native FQI of 20 or higher or a native mean C of 3.5 or higher and 2) presence of four or more species recognized by the USFWS Chicago office as EPFO associate species (http://www.fws.gov/midwest/endangered/section7/s7process/plants/epfo_associates.html). In addition to the 15 sites noted above, one additional site occurring in the 2012 Addendum A study area met the USFWS survey criteria and was included in the 2013 EPFO survey. This site (Wetland Site 332) had a native mean C-value of 3.7 (native FQI of 19.5) and also had five associate species of EPFO. Wetland Site 332, surveyed in March 2013, likely would have had a higher FQI score if the botanical survey was conducted during the growing season.

Site selection for habitats occurring in the 2013 Illiana Addendum C study area was conducted by INHS scientists. The 2013 Illiana Addendum C Study Area consists of two previous (2008 and 2010) study areas (FAI 55 [Interstate-55] at Lorenzo Road and Illinois 129 [sequence #14011 and 14011A, respectively]), and results of these studies are presented in Keene and Ketzner (2008) and Wiesbrook et al. (2010). Due to the time-sensitive nature of EPFO surveys, as a conservative precaution, sites having FQI values of 17 or higher were also included during site selection. All sites initially described in Keene and Ketzner (2008) and Wiesbrook et al. (2010) had coefficient of conservatism values (C-values) following Taft et al. (1997), and before evaluating floristic quality assessment (FQA) data for site selection, these data sets were converted to reflect C-values as assigned by Swink and Wilhelm (1994). Following this methodology, seven additional sites in Addendum C were added (**App. 2, Table 1**).

Prairie Sites 1, 3 – 5, 7, 8, 14, 15, & 17, described in Murphy (2013), were selected for 2013 EPFO surveys (**App. 2, Table 1**). These sites had previously been searched for EPFO following USFWS guidelines, either during the 2009 growing season (Murphy 2009) or the 2012 growing season (Murphy 2013), but as a conservative precaution, were revisited due to their proximity to other sites already being visited.

One additional area was included in the 2013 EPFO surveys. This area, occurring on the west edge of the 2012 Addenda A study area approximately 500 ft. south of Wetland Site 397/30 (**App. 1, Fig. 1A**), was a highly degraded habitat noted in Murphy (2013), where three sterile rosettes were observed that potentially represented species within the Orchid family (Orchidaceae). This habitat was not a designated prairie or wetland habitat, and is not included in App. 2, Table 1.

Surveys for *Platanthera leucophaea* deviated slightly from the United States Fish and Wildlife Service (USFWS) protocol (http://www.fws.gov/midwest/endangered/plants/epfo.html). This protocol requires EPFO surveys to be conducted on three non-consecutive days between 28 June and 11 July. However, 2013 EPFO surveys to be conducted in Will County were directed to begin when individuals at known EPFO sites within the county, began blooming. Individuals at Grant Creek Nature Preserve began blooming on Friday, 21 June, and 2013 EPFO surveys were approved to begin on Monday, 24 June (Cathy Pollack, USFWS, pers. comm., 21 June, 2013). Due to the earlier 24 June start date for Will County, surveys were to be finished on 5 July. However, one landowner refused access to multiple wetland sites, and arrangements needed to be made with the Will County Sheriff's Department for a police escort. This delayed access to these sites, and in order to meet the three non-consecutive day requirement, approval was given to extend surveys to 9 July (Cathy Pollack, USFWS, pers. comm., 1 July, 2013).

Botanical nomenclature throughout this report, in order to maintain consistency with nomenclature in Wilm et al. (2013), follows Swink and Wilhelm (1994). If not specifically stated, scientific names followed by an asterisk (*) denote vascular plants that are adventive to the region. Collected plant specimens associated with this project are deposited in the INHS herbarium (ILLS), in Champaign, Illinois.

RESULTS AND DISCUSSION

No EPFO individuals were observed at any of the 32 wetland and prairie sites that were searched. Two of the three sterile rosettes observed during the 2012 growing season approximately 500 ft. south of Wetland Site 397/30 (**App. 1, Fig. 1A**) on the margins of a degraded shrubland area, were determined to be colic root (*Aletris farinosa*), a native member of the Lily family (Liliaceae), but not a state listed species, while the third rosette could not be relocated. This third rosette, while appearing to be an orchid, is not EPFO; rather, likely another as yet determined species. Site visits made during 2013 occurred on 25 and 27 June, and 4 July. Repeat visits to this site during late June of 2012 found the leaves of this third rosette brown and wilted, and it is possible the plant represented by this third rosette died during the severe drought that occurred in this region during the 2012 growing season. Site details, including FQA results (native FQI and native mean C scores) for all prairie and wetland sites visited are summarized in **App. 2, Table 1**, and the following site descriptions reflect the sequence in which these sites are presented in this table.

Wetland Site 58 (Marsh):

Wetland Site 58 is a relatively degraded marsh habitat west of and parallel to IL Route 50, in Peotone (**App. 1, Fig. 1B**), occurring in the low ditch areas between the Canadian National railroad and IL Route 50 (**App. 1, Figs. 2A and 2B**). The approximate length of this habitat was 0.5 mile, and various dominant species occurred in zones, including tussock sedge (*Carex stricta*), blue flag iris (*Iris virginica* var. *shrevei*), sandbar willow (*Salix interior*), river bulrush (*Scirpus fluviatilis*), and narrow-leaved cattail (*Typha angustifolia*). Portions of this site not subjected to extended periods of inundation possessed wet-mesic prairie/sedge meadow structure and composition, characteristic features similar to habitats where EPFO has been found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 59/Prairie Site 2 (Sedge meadow/Wet-mesic prairie):

Located on the west side of the Canadian National railroad in Peotone (**App. 1, Fig. 1B**), Wetland Site 59 and Prairie Site 2 overlap, and are intergrading, relatively high quality sedge meadow (**App. 1, Fig. 2C**) and mesic to wet-mesic prairie (**App. 1, Fig. 2D**). Dominant species in the sedge meadow habitat include tussock sedge (*Carex stricta*), Indian hemp (*Apocynum sibiricum*), and American bindweed (*Convolvulus sepium*); while dominant species in the mesic to wet-mesic prairie habitats include big bluestem (*Andropogon gerardii*), sawtooth sunflower (*Helianthus grosseserratus*), common mountain mint (*Pycnanthemum virginianum*), and Riddell's goldenrod (*Solidago riddellii*). Vegetation structure and composition at this site are similar to habitats where EPFO has been found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 220 (Wet shrubland):

Located on the east side of the Kankakee River in Wilmington (**App. 1, Fig. 1A**), Wetland Site 220 is a highly degraded wet depression within a forested matrix, which was dominated by shrubs, woody vines, and small to medium sized trees (**App. 1, Figs. 2E, 2F and 2G**). Dominant species at this site include false indigo bush (*Amorpha fruticosa*), green ash (*Fraxinus pennsylvanica* var. *subintegerrima*), moneywort* (*Lysimachia nummularia*), reed canary grass* (*Phalaris arundinacea*), poison ivy (*Rhus radicans*), sandbar willow (*Salix interior*), and black willow (*S. nigra*). Habitats within Wetland Site 220 lack characteristic features of habitats from where EPFO typically has been found; instead they are characterized by zones dominated by aggressive non-native and native ruderal species, zones of dense woody vegetation growth, and/or areas subjected to extended periods of inundation. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 230 (Wet meadow):

Wetland Site 230 is located approximately 1,200 ft. south of Wetland Site 220, in the immediate floodplain on the east side of the Kankakee River (**App. 1, Fig. 1A**). Due to high precipitation levels before and during surveys, as well as this site's location in the immediate floodplain of the Kankakee River, this area was completely submerged during the entire EPFO survey window (**App. 1, Figs. 3A and 3B**). Wetland Site 230 is a floodplain habitat with a disturbance regime characterized by extended periods of flooding. This habitat type and its landscape position are not characteristic features of habitats where EPFO has been found (***see also*** **App. 2, Table 1**).

Wetland Site 237 (Wet shrubland):

Wetland Site 237 is located inside the Department of Natural Resources (DNR) Des Plaines Conservation Area, approximately 1.5 miles north of the town of Wilmington (**App. 1, Fig. 1A**). This site is highly degraded with the majority of its area dominated by sandbar willow (*Salix interior*) and large saplings of cottonwood (*Populus deltoides*) (**App. 1, Figs. 3C, 3D and 3E**). Under this dense growth of woody species, reed canary grass* (*Phalaris arundinacea*) is the dominant species (**App. 1, Fig. 3C**). Additionally, the aggressive native ruderal species common reed (*Phragmites australis*) dominates various areas along the margins of this site. The majority of Wetland Site 237 lacks characteristic features of habitats from where EPFO has been found, and is characterized by zones dominated by aggressive non-native and native ruderal species, zones of dense woody vegetation growth, and areas subjected to extended periods of inundation. The majority of the more open areas on the margins of this site are highly degraded, and only small areas on the north and east boundaries of this site possess vegetation composition and structure (i.e. wet-mesic prairie and sedge meadow) similar to habitats where EPFO has

been found. Much of the area occurring on the margins of this site is mowed annually. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 252 (Forested wetland):

Wetland Site 252 is also located inside the DNR Des Plaines Conservation Area, just west of Wetland Site 237 (**App. 1, Fig. 1A**). This forested wetland site is relatively large and dominant species are variable. The more forested portions of this site are dominated by silver maple (*Acer saccharinum*) and black willow (*Salix nigra*) in the overstory and understory, with the ground flora most heavily dominated by reed canary grass* (*Phalaris arundinacea*) (**App. 1, Figs. 4A and 4B**). Other ground flora dominants in the forested areas include: wingstem (*Actinomeris alternifolia*), giant ragweed (*Ambrosia trifida*), Virginia wild rye (*Elymus virginicus*), and wild golden glow (*Rudbeckia laciniata*) (**App. 1, Fig. 4C**). Dominant species in the more open portions of this site (primarily on the northern end of the site) are common reed (*Phragmites australis*) and reed canary grass* (**App. 1, Fig. 4D**). Habitats occurring at Wetland Site 252 lack characteristic features of habitats from where EPFO typically has been found, and instead are characterized by zones dominated by aggressive non-native and native ruderal species, and/or areas that are forest habitats. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 264/19 (Wet prairie):

The two areas comprising Wetland Site 264/19 are located immediately east of Interstate-55, west of Wilmington (**App. 1, Fig. 1A**), and occur along the margins of an agricultural field. The northernmost portion of this site (**App. 1, Figs. 4E and 4F**) is highly degraded and dominated by several different species that occur in localized zones; these include blue joint grass (*Calamagrostis canadensis*), reed canary grass* (*Phalaris arundinacea*), common reed (*Phragmites australis*), smooth sumac (*Rhus glabra*), and Canada goldenrod (*Solidago canadensis*). The non-native tree, white mulberry* (*Morus alba*) is also abundant on the eastern portion of this site. The southernmost section of this site (**App. 1, Figs. 4G and 4H**) is small, but still possesses relatively diverse remnant habitats on its more open margins. Dominant species in this area are highly variable and occur in patches, and include blue joint grass (*Calamagrostis canadensis*), long-scaled tussock sedge (*Carex haydenii*), lance-fruited oval sedge (*C. scoparia*), marsh fern (*Dryopteris thelypteris* var. *pubescens*), deer tongue grass (*Panicum clandestinum*), munro grass (*P. rigidulum*), sensitive fern (*Onoclea sensibilis*), and Canada goldenrod (*Solidago canadensis*). Vegetation structure and composition at the southernmost portion of this site are similar to habitats where EPFO has been found, but only a very limited area on the interior of the northern portion possess these characteristics. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 266/18 (Wet meadow):

Wetland Site 266/18 is a degraded wet meadow (**App.1, Figs. 5A and 5B**) occurring on the margins of agricultural land, and is located immediately south of Wetland Site 264/19 (**App. 1, Fig. 1A**). Dominant species at this site include annual fleabane (*Erigeron annuus*), woolly sedge (*Carex pellita*), Dudley's rush (*Juncus dudleyi*), moneywort* (*Lysimachia nummularia*), and Canada goldenrod (*Solidago canadensis*). Small portions of Wetland Site 266/18 possess structure and composition similar to habitats where EPFO has been found, but the majority of this site is highly degraded and lacking in these characteristics. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 284 (Marsh):

Wetland Site 284 is located on the northern edge of the town of Wilmington, just west of the Kankakee River (**App. 1, Fig. 1A**). This relatively large site is highly degraded, with dominant species occurring in large patches and including reed canary grass* (*Phalaris arundinacea*), common reed (*Phragmites australis*), sandbar willow (*Salix interior*), and alsike clover* (*Trifolium hybridum*) (**App. 1, Figs. 5C – 5H**), with river bulrush (*Scirpus fluviatilis*) locally dominant in smaller patches. Habitats within Wetland Site 284 are highly degraded and lack characteristic features of habitats from where EPFO has been found; instead these areas are characterized by zones dominated by aggressive non-native and native ruderal species, zones of dense woody vegetation growth, and/or areas subjected to extended periods of inundation. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 295 (Wet meadow):

Located on the northwest edge of Wilmington (**App. 1, Fig. 1A**), Wetland Site 295 is a degraded wet meadow (**App. 1, Fig. 6A**). Dominant species at this site include tickle grass (*Agrostis hyemalis*), inland rush (*Juncus interior*), path rush (*J. tenuis*), and Canada goldenrod (*Solidago canadensis*), with lance-fruited oval sedge (*Carex scoparia*) and small saplings of silver maple (*Acer saccharinum*) dominant in localized areas. Although Wetland Site 295 possessed a graminoid structure similar to habitats where EPFO has been found, its composition, dominated in large part by native ruderal species, is not as indicative of typical EPFO habitats. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 332 (Marsh):

Wetland Site 332 is located approximately one mile west of Wilmington, east of Interstate-55 and north of Stripmine Road (**App. 1, Fig. 1A**). This site is relatively large, but highly degraded (**App. 1, Figs. 6B – 6H**). Much of the diversity at Wetland Site 332 occurs in small and scattered localized areas. The most dominant species at this site is reed canary grass* (*Phalaris arundinacea*) (**App. 1, Figs. 6E – 6G**). Other dominant species, that occur in small to relatively large patches, include sensitive fern (*Onoclea sensibilis*), common reed (*Phragmites australis*), sandbar willow (*Salix interior*), and narrow-leaved cattail (*Typha angustifolia*). The majority of Wetland Site 332 lacks characteristic features of habitats from where EPFO has been found, and instead is characterized by large zones of aggressive non-native and native vegetation, zones of dense woody vegetation growth, and/or areas subjected to extended periods of inundation. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 333/38 (Wet shrubland):

Wetland Site 333/38 is located approximately 500 ft. south and west of Wetland Site 332 (**App. 1, Fig. 1A**). This habitat consists of a small, semi-open wooded area in an otherwise more densely forested matrix (**App. 1, Figs. 7A – 7C**). Dominant species here include fowl manna grass (*Glyceria striata*), common rush (*Juncus effusus*), sensitive fern (*Onoclea sensibilis*), marsh fern (*Dryopteris thelypteris* var. *pubescens*), and poison ivy (*Rhus radicans*). Wetland Site 333/38, with its more forested structure, lacks characteristic features of habitats from where EPFO has been found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 335/36 (Pond/Wet meadow):

Wetland Site 335/36 is located immediately south of Wetland Site 333/38 (**App. 1, Fig. 1A**). This site consists of an artificial pond with highly degraded wet meadow habitats on its margins (**App. 1, Figs. 7D – 7H**). Dominant species here are variable and occur in localized zones. The two most dominant species at this site are common rush (*Juncus effusus*) and reed canary grass* (*Phalaris arundinacea*). At the time of site visits, much of this area had recently been impacted by earth-moving machinery, and was represented by bare soil, with little or no vegetation yet reestablished (**App. 1, Figs. 7G and 7H**). Wetland Site 335/36 lacks characteristic structure and composition of sites where EPFO has been found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 365/10 (Wet shrubland):

Wetland Site 365/10 is located immediately east of the northbound lanes of Interstate-55 (**App. 1, Fig. 1A**). Most portions of this site are highly degraded, and the highest quality areas are wet prairie habitats that occur on the south and west margins (**App. 1, Fig. 8A**). These wet prairie habitats range from moderately to heavily degraded and represent a smaller portion of this site than the shrubland habitats. The mature shrubland portion of this site (**App. 1, Fig. 8B**) has very high densities of shrubs and small trees, with dominant species including: silver maple (*Acer saccharinum*), pale dogwood (*Cornus obliqua*), sandbar willow (*Salix interior*), and common elderberry (*Sambucus canadensis*). Dominant species in the open, wet prairie habitats on the south and west margins are variable and occur in localized zones, but include blue joint grass (*Calamagrostis canadensis*), tussock sedge (*Carex stricta*), late boneset (*Eupatorium serotinum*), water knotweed (*Polygonum amphibium* var. *stipulaceum*), and cord grass (*Spartina pectinata*). Wet prairie habitats of Wetland Site 365/10, although small, possess characteristic features of habitats where EPFO has been found, but the majority of shrubland habitat at this site lacks these characteristics, and instead is very densely overgrown with woody species. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 372/42 (Pond/Wet meadow):

Wetland Site 372/42 is located approximately one mile west of Wilmington, east of Interstate-55 and north of Stripmine Road (**App. 1, Fig. 1A**). This wetland site is a relatively large pond/wet meadow habitat, with the majority of the site representing wet meadow (**App. 1, Figs. 8C and 8D**). The ponds in this area are artificial and were made by the landowner who regularly modifies the configuration of wetland habitats on this property with earthmoving machinery, for the training of waterfowl hunting dogs. Although the wet meadow habitats at this site are degraded, this large area hosts a diversity of native species. However, many of the more conservative native species are infrequent to occasional. Dominant species at this site are variable and occur in localized zones (often quite large), with several representing non-native species. Dominant species at this site include red top* (*Agrostis alba*), brown fox sedge (*Carex vulpinoidea*), red-rooted spike rush (*Eleocharis erythropoda*), smooth scouring rush (*Equisetum laevigatum*), fog fruit (*Lippia lanceolata*), purple loosestrife* (*Lythrum salicaria*), reed canary grass* (*Phalaris arundinacea*), red bulrush (*Scirpus pendulus*), and prairie cord grass (*Spartina pectinata*). Portions of Wetland Site 372/42 possess structure and composition similar to habitats where EPFO has been found. However, much of this site is dominated by zones of aggressive non-native and native vegetation as well as areas that are likely subjected to extended periods of inundation. These areas are not characteristic of habitats where EPFO is typically found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 374/45 (Wet shrubland):

Wetland Site 374/45 is located approximately 1.5 miles west of Wilmington, east of Interstate-55 on the northeast side of the intersection of Illinois Route 129 and Stripmine Road (**App. 1, Fig. 1A**). This site is a highly degraded wet shrubland and dominant species vary considerably depending upon location at the site (**App. 1, Figs. 8E – 8H**). Dominant species within different zones of this site include swamp agrimony (*Agrimonia parviflora*), brown fox sedge (*Carex vulpinoidea*), late boneset (*Eupatorium serotinum*), green ash (*Fraxinus pennsylvanica* var. *subintegerrima*), common rush (*Juncus effusus*), munro grass (*Panicum rigidulum*), reed canary grass* (*Phalaris arundinacea*), common reed (*Phragmites australis*), sandbar willow (*Salix interior*), and Canada goldenrod (*Solidago canadensis*). Wetland Site 374/45 is a relatively large area with a diversity of native species. However, many of these species are relatively infrequent. Overall, the majority of this site is dominated by zones of non-native and native ruderal species, including several that aggressively out-compete others. Additionally, zones of mature dense woody vegetation growth and areas subjected to extended periods of inundation are not characteristic of habitats where EPFO is typically found. Only limited areas at this site possess community structure and composition similar to habitats where EPFO has been found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 378/4 (Forested wetland/Wet shrubland):

Wetland Site 378/4 is located approximately 2.7 miles west of Wilmington, west of Interstate-55 and north of Murphy Road (**App. 1, Fig. 1A**). This site is a highly degraded forested wetland that intergrades with mature wet shrubland and wet meadow habitats (**App. 1, Figs. 9A – 9C**). Open habitats at this site are dominated by reed canary grass* (*Phalaris arundinacea*), common reed (*Phragmites australis*) and narrow-leaved cattail (*Typha angustifolia*), while forested and shrubland habitats are dominated by pale dogwood (*Cornus obliqua*), cottonwood (*Populus deltoides*), sandbar willow (*Salix interior*) and black willow (*S. nigra*). Community structure and composition at Wetland Site 378/4 are not characteristic of habitats where EPFO has been found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 397/30 (Wetland pond):

Wetland Site 397/30 is located approximately 2 miles west of Wilmington, just west of Interstate-55 and east of Cavanaugh Road (**App. 1, Fig. 1A**). This site is an artificial pond likely resulting from mining or gas pipeline installation activities that historically occurred in this area. The majority of area at this site is relatively shallow standing water (although water depth likely fluctuates with precipitation patterns) (**App. 1, Fig. 9D**). Dominant species at this site are red-rooted spike rush (*Eleocharis erythropoda*) and fog fruit (*Lippia lanceolata*). Community structure and composition at Wetland Site 397/30 are not characteristic of habitats where EPFO has been found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 400/21 (Wet meadow):

Wetland Site 400/21 is located approximately 2 miles west of Wilmington, 250 ft. southeast of Interstate-55, just north of Stripmine Road (**App. 1, Fig. 1A**). This site is a highly degraded, wet depression that occurs on a residential property (**App.1, Fig. 9E**). Much tree/woody vegetation clearing has occurred in portions of this general area, increasing the amount of mowed area here. The area where Wetland Site 400/21 occurs is regularly mowed when high precipitation levels don't prevent this (**App. 1, Fig. 9E**). The dominant species here is needle spike rush (*Eleocharis acicularis*), and depending on precipitation/moisture levels, much of the area here can be exposed soil after extended periods with

standing water. Structure, composition and disturbance patterns at Wetland Site 400/21 are not characteristic of habitats where EPFO has been found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 6 (Wet shrubland):

Wetland Site 6 is located approximately 2.7 miles west of Wilmington, west of Interstate-55 and north of Murphy Road (**App. 1, Fig. 1A**). This site is a relatively large, mature wet shrubland intergrading with degraded wet meadow habitats. This entire site is highly degraded and dominant species are variable and occur in relatively large zones. Dominant woody species in the densely overgrown areas were small to large cottonwood trees (*Populus deltoides*) and sandbar willow (*Salix interior*) (**App. 1, Figs. 10A – 10D**). These areas likely experience extended periods of inundation and vegetation under this dense growth is sparse. Open, wet meadow habitats are dominated by zones of several different species, including dogbane (*Apocynum cannabinum*), panicled aster (*Aster simplex*), rice cut grass (*Leersia oryzoides*), reed canary grass* (*Phalaris arundinacea*), common reed (*Phragmites australis*), and Canada goldenrod (*Solidago canadensis*). Wetland Site 6 lacks characteristic features of habitats from where EPFO has been found, and instead is characterized by large zones of aggressive non-native and native vegetation, zones of dense woody vegetation growth, and areas subjected to extended periods of inundation. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 7 (Wet meadow):

Wetland Site 7 is located approximately 100 ft. west of Wetland Site 6 (**App. 1, Fig. 1A**), and is a wet meadow/low ditch area between an agricultural field and an artificial pond on residential property (**App. 1, Figs. 10E and 10F**). This site is regularly mowed when high precipitation/moisture levels do not prevent it. Dominant species at this site include red-rooted spike rush (*Eleocharis erythropoda*), squirrel tail grass* (*Hordeum jubatum*), reed canary grass* (*Phalaris arundinacea*), and red bulrush (*Scirpus pendulus*). Wetland Site 7 lacks the community structure and composition of habitats from where EPFO typically has been found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Wetland Site 49 (Wetland pond):

Wetland Site 49 is located approximately 1.5 miles west of Wilmington, east of Interstate-55, on the southwest side of the intersection of Illinois Route 129 and Stripmine Road (**App. 1, Fig. 1A**). This site is an artificial pond surrounded by a forested matrix, and most of the site is occupied by standing water (**App. 1, Figs. 10G and 10H**). A portion of the north end of this site is dominated by common reed (*Phragmites australis*). Wetland Site 49 lacks the community structure and composition of habitats from where EPFO typically has been found. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Prairie Site 1 (Grade B to B+ dry-mesic/mesic prairie):

Prairie Site 1, located along the west side of the Canadian National (CN) railroad in Peotone (**App. 1, Fig. 1B**), is a very high quality dry-mesic to mesic remnant prairie habitat (**App. 1, Fig. 11A**). Portions of this remnant habitat trend toward more mesic moisture levels and community structure and composition in these areas are similar to habitats from where EPFO typically has been found. Additionally, ten species recognized by the USFWS Chicago office as EPFO associate species are present at this site, and include: big bluestem (*Andropogon gerardii*), heath aster (*Aster ericoides*), golden cassia

(*Cassia fasciculata*), sawtooth sunflower (*Helianthus grosseserratus*), rough blazing star (*Liatris aspera*), common mountain mint (*Pycnanthemum virginianum*), late goldenrod (*Solidago gigantea*), grass-leaved goldenrod (*Solidago graminifolia*), Indian grass (*Sorghastrum nutans*), and common spiderwort (*Tradescantia ohiensis*). Although this site was visited during the 2012 growing season following USFWS protocols, it was revisited due to its proximity to Wetland Site 59/Prairie Site 2 and Prairie Site 19 (**App. 1, Fig. 1B**). No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Prairie Site 3 (Grade C+ to B- dry-mesic/mesic prairie):

Prairie Site 3 is located along the west side of the CN railroad in Peotone, south of Prairie Site 1 (**App. 1, Fig. 1B**), and is a relatively high quality remnant dry-mesic to mesic prairie (**App. 1, Fig. 11B**). As with Prairie Site 1, portions of this remnant habitat are mesic and community structure and composition in these areas are similar to habitats from where EPFO typically has been found. Additionally, 13 species recognized by the USFWS Chicago office as EPFO associate species are present at this site, and include: big bluestem (*Andropogon gerardii*), Indian hemp (*Apocynum sibiricum*), heath aster (*Aster ericoides*), golden cassia (*Cassia fasciculata*), wild madder (*Galium obtusum*), sawtooth sunflower (*Helianthus grosseserratus*), rough blazing star (*Liatris aspera*), common water horehound (*Lycopus americanus*), common mountain mint (*Pycnanthemum virginianum*), late goldenrod (*Solidago gigantea*), grass-leaved goldenrod (*Solidago graminifolia*), Indian grass (*Sorghastrum nutans*), and common spiderwort (*Tradescantia ohiensis*). Although this site was visited during the 2012 growing season following USFWS protocols, it was revisited due to its proximity to Wetland Site 59/Prairie Site 2 and Prairie Site 19 (**App. 1, Fig. 1B**). No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

Prairie Sites 4, 5, 7, 8, & 19 (Grade C dry-mesic/mesic prairie):

Prairie Sites 4, 5, 7, 8, and 19 are located on the east (sites 7 & 8) and west (sites 4, 5 & 19) sides of the CN railroad in Peotone (**App. 1, Fig. 1B**), and are moderately to highly degraded remnant prairie habitats (**App. 1, Figs. 11C and 11D**). In Murphy (2013) these sites, as well as Prairie Site 6, had their species lists combined due to their similarities in moisture class, species compositions, and levels of degradation. However, Prairie Site 19 was not included in the 2012 EPFO surveys because it was not included in the original 2012 Illiana study area, but later added in Addendum B. For this reason, Prairie Site 19 was included in 2013 EPFO surveys. Due to the proximity of prairie sites 4, 5, 7, & 8 to Wetland Site 59/Prairie Site 2 and Wetland Site 58 (in some cases immediately adjacent to and intergrading with these wetland sites) (***see*** **App. 1, Fig. 1B**), these areas, although surveyed during the 2012 growing season following USFWS protocols, were revisited. Due to time constraints, Prairie Site 6, which occurs further south along this railroad line and was surveyed for EPFO during the 2012 growing season, was not revisited.

A total of 12 species recognized by the USFWS Chicago office as EPFO associate species are present within these prairie habitats, with at least four occurring in each individual area; these include: big bluestem (*Andropogon gerardii*), Indian hemp (*Apocynum sibiricum*), heath aster (*Aster ericoides*), tussock sedge (*Carex stricta*), sawtooth sunflower (*Helianthus grosseserratus*), rough blazing star (*Liatris aspera*), common water horehound (*Lycopus americanus*), wild mint (*Mentha arvensis* var. *villosa*), late goldenrod (*Solidago gigantea*), grass-leaved goldenrod (*Solidago graminifolia*), Indian grass (*Sorghastrum nutans*), and common spiderwort (*Tradescantia ohiensis*). Only four of these associates were observed in Prairie Site 19, and include big bluestem, heath aster, Indian grass and common spiderwort. As with Prairie Sites 1 & 3, each of these sites have portions (though sometimes quite small) that trend toward mesic, and community structure and composition in these areas are similar to habitats

from where EPFO typically has been found. No EPFO individuals were located at any of these sites during 2013 surveys (***see also*** **App. 2, Table 1**).

Prairie Sites 14 & 15 (Grade C- to D dry-mesic sand prairie):

Prairie Sites 14 and 15 are located along Interstate-55 approximately 2 miles west of Wilmington (**App. 1, Fig. 1A**), with Prairie Site 14 located in the median between the northbound and southbound lanes, and Prairie Site 15 located on the east side of the northbound lanes (**App. 1, Fig. 1A**). These two sites are highly degraded dry-mesic sand prairie communities (**App. 1, Figs. 11E and 11F**), and due to their similarities in moisture class, species compositions, and levels of degradation, were combined in Murphy (2013). These prairie sites were surveyed during the 2009 growing season following USFWS protocols (Murphy 2009), but as a conservative precaution, these sites were revisited.

Eight species recognized by the USFWS Chicago office as EPFO associate species are present in these areas, and include: big bluestem (*Andropogon gerardii*), Indian hemp (*Apocynum sibiricum*), heath aster (*Aster ericoides*), golden cassia (*Cassia fasciculata*), marsh blazing star (*Liatris spicata*), grass-leaved goldenrod (*Solidago graminifolia*), Indian grass (*Sorghastrum nutans*), and common spiderwort (*Tradescantia ohiensis*). Dominant species at Prairie Site 14 are non-native and native ruderal species, including broom sedge (*Andropogon virginicus*), Kentucky blue grass* (*Poa pratensis*), Canada goldenrod (*Solidago canadensis*), autumn olive* (*Elaeagnus umbellata*), non-native honeysuckle shrubs (*Lonicera* X *bella* and *L. maackii*), and Japanese crab* (*Malus sieboldii*). Dominant species at Prairie Site 15, which is very small, are flowering spurge (*Euphorbia corollata*), downy sunflower (*Helianthus mollis*), Canada goldenrod, and grass-leaved goldenrod.

These prairie sites lack characteristic features of habitats from where EPFO has been found, and instead are characterized by large zones of aggressive non-native and native vegetation, including large zones of dense woody vegetation growth. No EPFO individuals were located at these sites during 2013 surveys (***see also*** **App. 2, Table 1**).

Prairie Site 17 (Grade C to C- mesic sand prairie):

Prairie Site 17 is located in the median between the northbound and southbound lanes of Interstate-55, immediately south and west of Prairie Site 14 (**App. 1, Fig. 1A**). This site is a highly degraded mesic sand prairie and was surveyed during the 2009 growing season following USFWS protocols (Murphy 2009). As a conservative precaution (as with Prairie Sites 14 & 15) this site was revisited.

Thirteen species recognized by the USFWS Chicago office as EPFO associate species are present at this site, and include: big bluestem (*Andropogon gerardii*), Indian hemp (*Apocynum sibiricum*), heath aster (*Aster ericoides*), blue joint grass (*Calamagrostis canadensis*), wild madder (*Galium obtusum*), sawtooth sunflower (*Helianthus grosseserratus*), marsh blazing star (*Liatris spicata*), common water horehound (*Lycopus americanus*), common mountain mint (*Pycnanthemum virginianum*), late goldenrod (*Solidago gigantea*), grass-leaved goldenrod (*Solidago graminifolia*), Indian grass (*Sorghastrum nutans*), and common spiderwort (*Tradescantia ohiensis*). Additionally, two of these species were dominant to sub-dominant in the herbaceous layer, and include common mountain mint and grass-leaved goldenrod. However, as with Prairie Site 14, a large portion of Prairie Site 17 is being densely encroached upon by woody species (**App. 1, Figs. 11G and 11H**), the majority of which are non-native; these include autumn olive* (*Elaeagnus umbellata*), amur honeysuckle* (*Lonicera maackii*), and Japanese crab* (*Malus sieboldii*).

Several of the more open areas within Prairie Site 17 possess characteristic features of habitats from where EPFO has been found. However, the majority of this site is characterized by large, dense patches of aggressive non-native woody vegetation growth. No EPFO individuals were located at this site during 2013 surveys (***see also*** **App. 2, Table 1**).

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Appendix 1

Figures

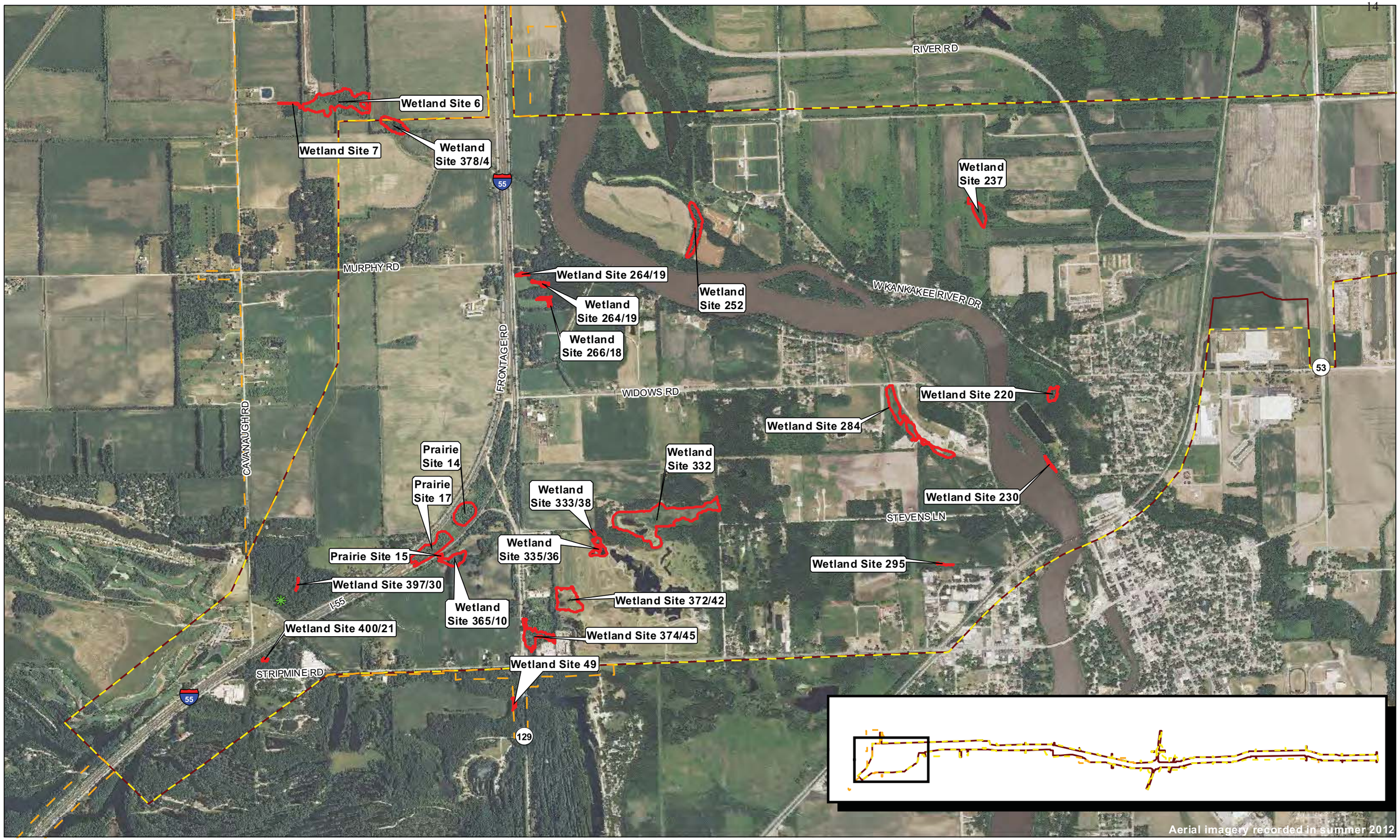

Figure 1A. Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) survey locations near Wilmington, in Will County, Illinois

Basal Rosettes Observed in 2012 (Not EPFO) | Survey Sites | Illiana Addendum C | Illiana Addendum B | Illiana Addendum A

1:20,000

0 1,000 2,000 4,000 Feet

N

N-597

Jarvis, 8/6/13

Figure 1B. Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) survey locations near Peotone, in Will County, Illinois

Surveyed Sites | Illiana Addendum C | Illiana Addendum B | Illiana Addendum A

1:5,000

0 250 500 1,000 Feet

N

N-598

Jarvis, 8/6/13

Figure 2. Photographs of 2013 Illiana EPFO survey sites, Will County, IL. **A & B** - Wetland Site 58 (photo **A** with portion of Prairie Site 7 in foreground), showing large colonies of narrow-leaved cattail (in background), which dominated many portions of this site; **C** - Wetland Site 59 (showing tussock sedge, a dominant at this site) and **D** - Prairie Site 2 (Wetland Site 59 and Prairie Site 2 intergraded into a larger sedge meadow/wet-mesic prairie complex here); **E, F & G** - various portions of Wetland Site 220; **E & G** - areas that experience prolonged inundation; **F** - reed canary grass, a dominant at this site.

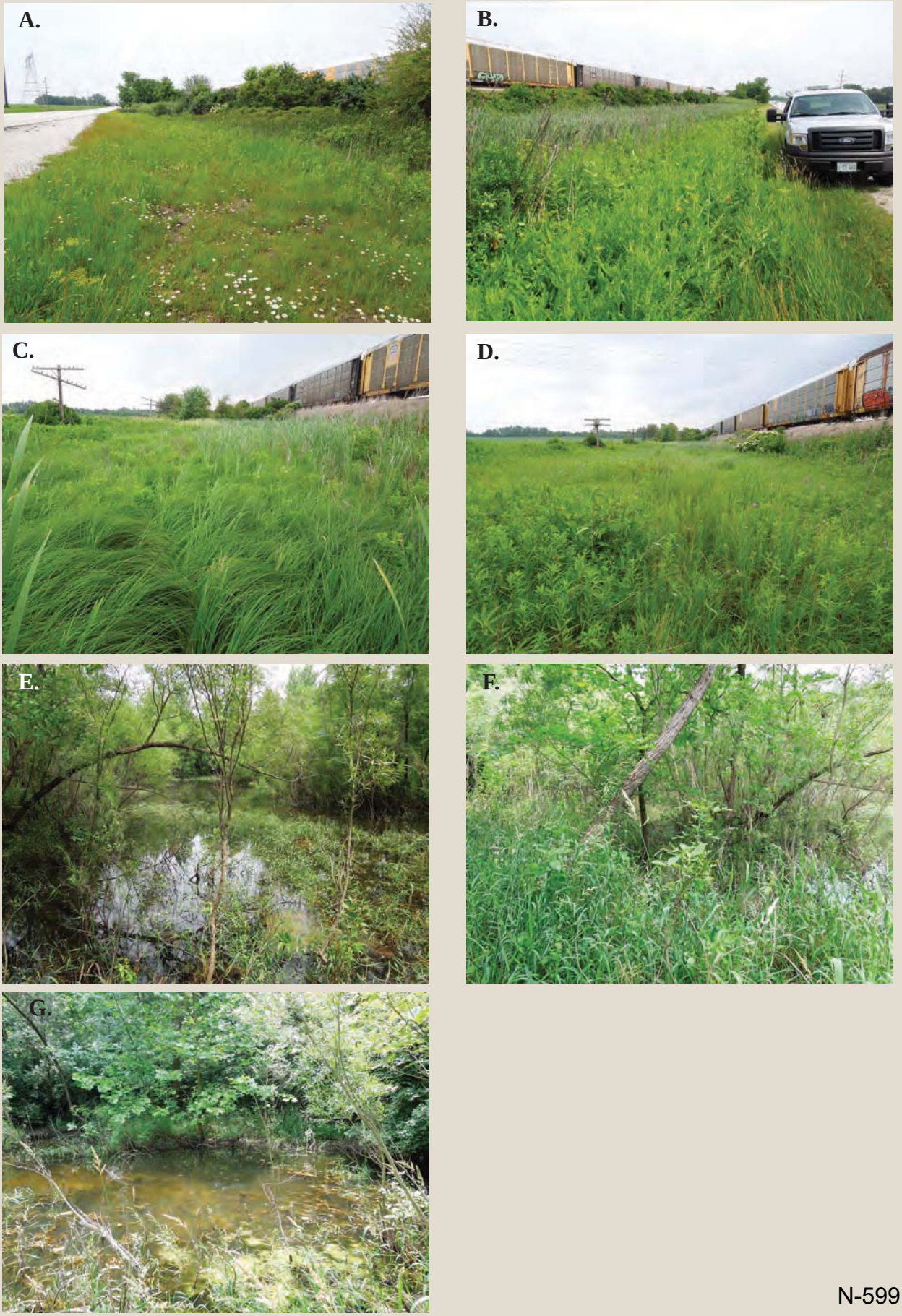

Figure . Photographs of 2013 Illiana EPFO survey sites, Will County, IL. **A & B -** Wetland Site 230. his site, located in the ankakee iver floodplain, experiences periods of extended flooding and was underwater during the entire EPFO survey window; **C, D & E -** Wetland Site 237. **C -** inside the dense colony of sandbar willow, with reed canary grass underneath (both were site dominants). **D & E -** showing dense growth of sandbar willow and cottonwood saplings. his thicket dominanted much of Wetland Site 237.

Figure . Photographs of 2013 Illiana EPFO survey sites, Will County, IL. **A, B, C, & D** - various areas within Wetland Site 252. **A & B** - showing reed canary grass dominated areas underneath canopy of silver maple, another dominant at this site. **C** - small portion of site 252 dominated by wingstem and wild goldenglow. **D** - more open portion of site 252, dominated by reed canary grass and common reed. **E, F, G, &** - Wetland Site 2 /19. orthern portion of Site 2 /19 (**E & F** - showing reed canary grass, common reed, and white mulberry, which were locally dominant). Southern portion of Site 2 /19 (**G &** - showing areas with remnant prairie/sedge meadow structure and composition.

Figure . Photographs of 2013 Illiana EPFO survey sites, Will County, IL. **A & B** - Wetland Site 2 /18. **C, D**, **E, F, G, &** - various areas within Wetland Site 28 ; **C** - area dominated by common reed, **D** - portion of site 28 dominated by alsike clover, **E** - site 28 from a distance, showing dense stand of reed canary grass, **F** - portion of site 28 dominated by reed canary grass and annual fleabane (foreground) and sandbar willow (background), **G** - reed canary grass dominated area (foreground) and common reed dominated area (background), - reed canary grass dominated area on west end of site 28 .

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Figure . Photographs of 2013 Illiana EPFO survey sites, Will County, IL. **A** - Wetland Site 295, showing Canada goldenrod and path rush, the two most dominant species at this site. **B G** - various areas within Wetland Site 332; **B** - southeast portion, showing reed canary grass dominance as the site is approched from this direction, **C & D** - small area within site 332 dominated by sensitive fern and Canada goldenrod, but with a relative diversity of other species, too, **E, F & G** - showing the dominance of reed canary grass, the most dominant species at this site (**G** - with common reed colony in background, - inside a sandbar willow thicket, which dominated a portion of site 332). nder the sandbar willow, reed canary grass was dominant.

Figure . Photographs of 2013 Illiana EPFO survey sites, Will County, IL. **A, B & C** - Wetland Site 333/38. **A** - overview of this very small site, appearing as a small, semi-open area in a more densely forested matrix, **B** - photo showing sensitive fern, one of the dominant species at this site, **C** - portion of site 333 dominated by fowl manna grass, poison ivy and marsh fern. **D, E, F, G, &** - various areas within Wetland Site 335/3 ; **D** - overview, facing west, **E** - portion of site dominated by common rush, **F** - site overview, facing east, **G &** - wet, exposed portion of the west edge of the site where earthmoving activities had recently occurred.

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Figure . Photographs of 2013 Illiana EPFO survey sites, Will County, IL. **A & B** - Wetland Site 3 5/10; **A** - wet prairie portion of this site, occurring on south and west margins, **B** - shrubland portion of this site. **C & D** - Wetland Site 372/ 2; **C** - area dominated by the non-native purple loosestrife, **D** - large section dominated by red bulrush. **E, F, G, &** - Wetland Site 37 / 5; photographs showing areas dominated by **E** - reed canary grass, **F** - munro grass (in saturated area), **G** - common reed (in background), late boneset, Canada goldenrod (tall fescue is in foreground, but not a site dominant), and - late boneset and Canada goldenrod.

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Figure . Photographs of 2013 Illiana EPFO survey sites, Will County, IL. **A, B & C** - Wetland Site 378/ ; **A** - reed canary grass , a community dominant, on west side of this site, **B** - small portion of this site dominated by sawtooth sunflower, Canada goldenrod and late goldenrod, **C** - two of the site dominants, reed canary grass (in foreground) and common reed (in background). **D** - Wetland Site 397/30, showing wetland pond habitat. **E** - Wetland Site 00/21, an area that is typically mowed when dry.

Figure . Photographs of 2013 Illiana EPFO survey sites, Will County, IL. **A, B, C, & D** - Wetland Site ; **A** - photograph showing one dominated by small cottonwood trees, **B** - Canada goldenrod dominated area (in foreground) and reed canary grass dominated area (in background), **C** - area dominated by rice cut grass in foreground) and dogbane (in background), **D** - Canada goldenrod and common reed dominated area (in foreground) and sandbar willow thicket (in background). **E & F** - Wetland Site 7, standing water in a low ditch that when dry enough, is regularly mowed. **G &** - Wetland Site 9; **G** - standing water occupied most of this site, - north end, which was dominated by common reed.

Figure . Photographs of 2013 Illiana EPFO survey sites, Will County, IL. **A** Prairie Site 1. **B** - Prairie Site 3 (showing lead plant purple flowers on left and purple prairie clover small purple inflorescence on right in foreground (photo taken in 2012). **C** portion of Prairie Site 7 (similar in composition to Prairie Sites , 5, 8, 19, and grouped with these prairie sites in urphy 2013 , photo taken in 2012). **D** - Prairie Site 19 (dominated by little bluestem and big bluestem). **E**- Prairie Site 1 , dominated by woody species, with small openings interspersed. **F** - Prairie Site 15 (small patch of prairie on east side of I-55, across from Prairie Sites 1 and 17). **G &** - Prairie Site 17, dominated by woody species, interspersed with small to large openings.

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Appendix 2

Tables

Table 1. Summary of sites (n = 32) searched during the 2013 growing season, for EPFO, within the IDOT Illiana Study Area (Addenda A, B & C), Will County, Illinois. Floristic quality index comparisons are provided for sites deliniated in 2008 or 2010, as FQI results using both Swink & Wilhelm (1994) and Taft et al. (1997) C values were available for these sites, and provide direct comparisons based on identical data sets. FQI and mean C values for Prairie Sites 4, 5, 7, 8, & 19 represent values derived from combining species lists from all sites. Surveys conducted during the 2012 growing season on wetland sites previously described in Keene & Ketzner(2008) and Wiesbrook et al. (2010) (presented in Wilm et al. [2013]) yielded slightly different species lists, and FQI results for these data (using Swink & Wilhelm [1994] C values) are presented in a separate column. Sites with "NA" in the 2012 data column are in Illiana 2013 Addendum C, and updated data is not yet available. FQI and Mean C values presented represent the native FQI and native Mean C.

Sites visited in June/July 2013 (n = 32)	Report(s) sites are described in and corresponding site numbers:				Days visited	Site description	Swink & Wilhelm (1994): FQI (Mean C)	Taft et al. (1997): FQI (Mean C)	FQI (Mean C) from 2012 data	EPFO observed	Site selected by
	Keene & Ketzner (2008)	Wiesbrook et al. (2010)	Murphy (2013)	Wilm et al. (2013)							
A				Wetland Site 58	June 25, 27; July 3	Marsh	NA	NA	28.5 (3.8)	No	USFWS
B			Prairie Site 2	Wetland Site 59	June 25, 27; July 3	Sedge meadow/mesic/wet-mesic prairie	NA	NA	20.6 (3.5)	No	USFWS
C				Wetland Site 220	June 25, 27; July 3	Wet shrubland	NA	NA	20.9 (3.4)	No	USFWS
D				Wetland Site 230	June 25, 27; July 3	Wet meadow	NA	NA	20.2 (3.4)	No	USFWS
E				Wetland Site 237	June 26, 28; July 2	Wet shrubland	NA	NA	21.2 (2.8)	No	USFWS
F				Wetland Site 252	June 26, 28; July 2	Forested wetland	NA	NA	23.2 (3.5)	No	USFWS
G (north)		Wetland Site 19		Wetland Site 264	June 26, 28; July 2	Wet prairie	24.5 (4.5)	20.8 (3.7)	23.2 (3.8)	No	USFWS
G (south)		Wetland Site 19		Wetland Site 264	June 26, 28; July 2	Wet prairie				No	USFWS
H		Wetland Site 18		Wetland Site 266	June 26, 28; July 2	Wet meadow	20.6 (3.5)	17.5 (2.9)	19.9 (3.6)	No	INHS
I				Wetland Site 284	June 25, 27; July 3	Marsh	NA	NA	24.4 (2.9)	No	USFWS
J				Wetland Site 295	June 25, 27; July 3	Wet meadow	NA	NA	20.0 (4.0)	No	USFWS
K				Wetland Site 332	June 26, 28; July 2	Marsh	NA	NA	19.5 (3.7)	No	INHS
L (sheriff escort)		Wetland Site 38		Wetland Site 333	July 3, 5 & 9	Wet shrubland	23.1 (4.5)	20.0 (3.9)	21.4 (4.2)	No	USFWS
M (sheriff escort)		Wetland Site 36		Wetland Site 335	July 3, 5 & 9	Pond/wet meadow	29.7 (4.2)	24.1 (3.4)	26.3 (3.7)	No	USFWS
N	Wetland Site 10			Wetland Site 365	June 25, 27; July 3	Wet shrubland	27.6 (3.9)	23.8 (3.3)	16.0 (3.4)	No	INHS
O (sheriff escort)		Wetland Site 42		Wetland Site 372	July 3, 5 & 9	Pond/wet meadow	27.6 (3.7)	24.5 (3.4)	24.3 (3.6)	No	USFWS
P		Wetland Site 45		Wetland Site 374	June 26, 28; July 2	Wet shrubland	27.8 (3.4)	23.6 (3.0)	24.4 (3.7)	No	USFWS
Q		Wetland Site 4		Wetland Site 378	June 26, 28; July 2	Forested wetland/Wet shrubland	17.6 (3.3)	14.2 (2.7)	21.9 (3.1)	No	USFWS
R		Wetland Site 30		Wetland Site 397	June 25, 27; July 4	Wetland pond	19.6 (3.8)	15.5 (3.0)	10.8 (2.8)	No	INHS
S		Wetland Site 21		Wetland Site 400	June 25, 27; July 4	Wet meadow	13.4 (4.8)	9.0 (3.0)	2.9 (1.2)	No	INHS
T		Wetland Site 6			June 26, 28; July 2	Wet shrubland	17.9 (2.9)	14.8 (2.4)	NA	No	INHS
U		Wetland Site 7			June 26, 28; July 2	Wet meadow	12.3 (3.9)	8.9 (2.6)	NA	No	INHS
V		Wetland Site 49			June 25, 27; July 4	Wetland pond	13.0 (3.9)	11.5 (3.5)	NA	No	INHS
W			Prairie Site 1		June 25, 27; July 3	Dry-mesic/mesic prairie	NA	42.6 (4.5)	NA	No	INHS
X			Prairie Site 3		June 25, 27; July 3	Dry-mesic/mesic prairie	NA	38.1 (4.0)	NA	No	INHS
Y			Prairie Site 4		June 25, 27; July 3	Dry-mesic/mesic prairie	NA	37.6 (3.7)	NA	No	INHS
Z			Prairie Site 5		June 25, 27; July 3	Dry-mesic/mesic prairie	NA	37.6 (3.7)	NA	No	INHS
AA			Prairie Site 7		June 25, 27; July 3	Dry-mesic/mesic prairie	NA	37.6 (3.7)	NA	No	INHS
BB			Prairie Site 8		June 25, 27; July 3	Dry-mesic/mesic prairie	NA	37.6 (3.7)	NA	No	INHS
CC			Prairie Site 14		June 25, 27; July 3	Dry-mesic sand prairie	NA	26.1 (3.6)	NA	No	INHS
DD			Prairie Site 15		June 25, 27; July 3	Dry-mesic sand prairie	NA	26.1 (3.6)	NA	No	INHS
EE			Prairie Site 17		June 25, 27; July 3	Mesic sand prairie	NA	39.6 (4.0)	NA	No	INHS
FF			Prairie Site 19		June 25, 27; July 3	Dry-mesic/mesic prairie	NA	37.6 (3.7)	NA	No	USFWS

Mist Net Survey for the Federally Protected Indiana Bat (*Myotis sodalis*)

Lake County, Indiana

Prepared For:

Parsons Brinckerhoff

Prepared By:

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November 2013

N-611

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APPENDIX B BAT SPECIES PHOTOGRAPHS

Executive Summary

Cardno JFNew conducted a mist net survey to determine the presence or probable absence of the federally endangered Indiana bat (*Myotis sodalis*) within the Lake County, Indiana portion of the Illiana Corridor. The survey was conducted during the summer of 2012 (five sites) and the summer of 2013(one site). A total of 26 bats were captured consisting of three species: 15 eastern red bats (*Lasiurus borealis*), nine big brown bats (*Eptesicus fuscus*), and two northern bats (*Myotis septentrionalis*).

A supplementary acoustic survey performed at the five survey sites conducted in 2012 recorded 2,551 files, of which 2,049 sounds were identified as bat passes. The bat passes were labeled to species or group. The category big brown/silver-haired bat contained the most passes, followed by unidentified high frequency group, red bats, unidentified low frequency group, *Myotis* species, hoary bats, and evening bats.

The federally endangered Indiana bat was not caught or recorded during this survey and does not likely occur or use habitat within the Illiana Corridor. Although construction of the roadway may not directly impact the Indiana bat, it could indirectly exclude Indiana bats and other species from roosting and foraging habitat by creating a geographic and physical barrier.

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1.0 Introduction

In the eastern United States, bat populations are declining dramatically. Bats are threatened by continued habitat loss, spread of White-nose syndrome (WNS) and further complicated by wind facility development. In the eastern United States bats are important predators of nocturnal flying insects, of which many are agricultural and forestry pests. Bats are estimated to save billions of dollars a year in pesticide use throughout the continental United States (Boyles et al. 2011). Conservation of bats is important because bats play a critical role in reducing insect populations that would otherwise damage our food supply and other natural resources.

The Illiana Corridor is proposed as a new fully access controlled highway connecting Interstate Highway 55 (I-55) in northeastern Illinois to Interstate Highway 65 (I-65) in northwestern Indiana, which would be operated as a toll facility. The *Illiana Expressway Economic Opportunities Analysis* concluded that a new transportation facility between I-55 in Illinois and I-65 in Indiana could provide a new east-west connection as an alternative to the congested I-80 and produce substantial northeast Illinois and northwest Indiana regional economic benefits over a 30 year period. The lead agencies are the Illinois Department of Transportation (IDOT), the Indiana Department of Transportation (INDOT), and the Federal Highway Administration (FHWA).

The Illiana Corridor was developed through extensive analysis within the project Study Area. The general location of the Study Area is between I-55 in Illinois on the west, I-65 in Indiana on the east, the areas south of US 30 to the northern portion of Kankakee County in Illinois and the southern portion of Lake County in Indiana. The evaluation of travel performance, and socioeconomic and environmental impacts were key considerations in the overall alternative corridors development and evaluation process. Based on the consideration of the entire evaluation process, Corridors A3S2, B3, and B4 were carried forward for detailed analysis in the Tier One National Environmental Policy Act (NEPA) Environmental Impact Statement (Tier One) along with the No-Action Alternative. The Tier One combined Final Environmental Impact Statement (FEIS)/Record of Decision (ROD) identified Corridor B3 as the preferred corridor.

As part of the Tier Two NEPA Draft Environmental Impact Statement (DEIS), alternatives were developed within the Corridor and mist net and acoustic surveys were conducted to determine the presence or probable absence of the Indiana bat and subsequently the general bat community within Illiana Corridor.

1.1 Roadways Effect on Bats

Roadways are prevalent on the modern landscape but their impact on bat populations is not well understood. Roadways are a known direct source of bat mortality, but less is known about the effects of roadways as a physical barrier to bats. Roadways may restrict access to other habitats during summer foraging, reducing a bat's ability to find new or access established foraging areas (Bennett and Zurcher 2012). There are only a limited number of studies documenting how bats interact with roadways. One 2010

study conducted near the Indianapolis International Airport suggests that bats may try to avoid vehicles and may perceive them as predators. Sixty percent of bats that approached a rural road with a vehicle traveling an average of 10 meters away showed avoidance behavior and did not cross the road (Zurcher et al. 2010). Larger roadways such as multilane highways may be a greater barrier to bats than smaller roadways further restricting access to habitat. Furthermore, it is unclear how roadways affect bats during migration. Where bats fly on the landscape (i.e., at what altitude and if they follow landscape features) during migration is not well understood. It is likely that bats can and do migrate over (or possibly under) roads during migration but the effects roadways have on their ability to reach areas where they summer are unknown.

1.2 Indiana Bat

The Indiana bat is listed as an endangered species by the U. S. Fish and Wildlife Service (USFWS) and Indiana Department of Natural Resources (Indiana DNR) (USFWS 2007, IDNR 2007). Indiana bats are medium-sized species in the genus *Myotis*. Their forearm length ranges from 35 to 41millimeters (mm), and their total length varies from 71 to 91mm. Their tragus is short and rounded. Their pinkish-brown fur is extremely fine and fluffy in texture (Whitaker and Hamilton 1998). Indiana bats are similar in appearance to little brown bats (*Myotis lucifugus*) and northern bats (*Myotis septentrionalis*), but Indiana bats can be distinguished from related species by the presence of a keeled calcar, toe hairs that do not extend pass the knuckle joints, and a lighter colored nose (USFWS 2007).

Indiana bats occur in most of the eastern United States from New England to the Mississippi Valley, including most of the midwest (Whitaker and Hamilton 1998). During the summer, Indiana bats range from western Vermont to eastern Oklahoma and from southern Michigan to northern Alabama. Winter distribution of Indiana bats was historically located in states with limestone karst regions, although many of these bats now hibernate in abandoned mines. Hibernating Indiana bats occur in at least 19 states but most are found in Illinois, Indiana, Kentucky, and Missouri (USFWS 2007).

Indiana bats have a yearly cycle of hibernation, migration, and summer residency. Like many other bats, the Indiana bat has adapted to survive winter conditions when flying insects are not available by hibernating in suitable underground sites. These sites include caves and mines where air temperatures remain cool but above freezing. During hibernation, Indiana bats can form large groups containing thousands of individuals (Whitaker and Hamilton 1998). Some hibernacula of the Indiana bat have been designated critical habitat including 11 caves and two mines in six states (USFWS 2007).

After spring migration, females gather in summer maternity colonies that contain up to 384 adults (Whitaker and Brack 2002), whereas males form small bachelor colonies or remain solitary (USFWS 2007). The behavior of migrating Indiana bats and the paths they follow have not been well studied. Direction and distance have been documented, and the maximum known migration distance is 356 miles (Kurta and Murray 2002).

During summer, the females give birth to their single young and raise them until they are able to fly (Whitaker and Hamilton 1998). Indiana bats roost in dead or live trees with exfoliating bark, with colonial females typically using larger trees than males (Kurta 2005). Trees most commonly used by Indiana bats as roosts are ashes, cottonwoods, hickories, maples, and oaks (Callahan et al. 1997, Kurta 2005, Sparks et al. 2005, Whitaker and Sparks 2008). Female Indiana bats concentrate their roosting activity in summer at one to three trees that are termed primary roosts. Members of a colony may use 10–15 alternate or secondary roosts throughout the course of a summer. Unlike primary roosts, secondary roosts are usually occupied by only a few individuals for a few days at a time. Indiana bats typically switch roosts many times during the summer, often every one to three days (Kurta 2005). Most roost trees are located in places such as forest edge or canopy gaps that have higher solar exposure, thus providing warmth and reducing the amount of internal energy needed for thermoregulation (USFWS 2007). Indiana bats forage in and around forested habitat, in corridors through the woods (e.g., roads, trails, streams), in canopy gaps, above the canopy, and along forest edges and wooded fence rows (Menzel et al. 2001, Sparks et al. 2005).

The Indiana bat's decline may be due to disturbance or destruction of hibernacula, loss of summer habitat, and more recently to WNS. The estimated number of Indiana bats was 883,300 in 1965 (prehistoric estimates may have been in the millions) and has declined in the last five decades to 424,708 in 2011 (USFWS 2011). Without protection for or mitigation for the loss of summer habitat and hibernacula, and without protection from WNS, Indiana bats will continue to decline until extinction.

1.3 Species and Status of Bats Potentially Found within the Project Area

Nine species of bats have ranges that overlap with Lake County, Indiana including the big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), evening bat (*Nycticeius humeralis*), hoary bat (*Lasiurus cinereus*), Indiana bat, little brown bat, northern bat, silver-haired bat (*Lasionycteris notivagans*), and tricolored bat (*Perimyotis subflavus*, Whitaker et al. 2007). All bat species that occur in Indiana, except the big brown bat, are listed by Indiana DNR as either state endangered or a species of concern (Table 1-1) (IDNR 2007). Furthermore, WNS (Blehart et al. 2009), a deadly disease affecting bats, is spreading rapidly. More species of bats may eventually be listed as threatened or endangered at state and/or federal levels because of this disease, and currently the USFWS is evaluating requests to add the little brown bat and the northern bat to the federal list of endangered species (Center for Biological Diversity 2010; Kunz and Reichard 2010).

Bat species roost and forage in different habitats although there is some overlap among species. The big brown bat typically forages in open habitats (i.e., agricultural fields) and roosts in buildings (Loeb and O'Keefe 2006, Whitaker and Hamilton 1998). Red bats forage in open habitats and roost in foliage (Mager and Nelson 2001, Walters et al. 2006). Evening bats, a state endangered species, tend to forage mostly along lowland forests and streams (Whitaker et al. 2007) but do forage selectively in agriculture fields (Duchamp et al. 2004). Evening bats typically roost in cavities but can be found in

Table 1-1. Status of Indiana's Bat Species

Species	Regulatory Status
Big brown bat	None
Eastern red bat	Species of concern
Evening bat	State endangered
Gray bat	State endangered (federally endangered)
Hoary bat	Species of concern
Indiana bat	State endangered (federally endangered)
Little brown bat	Species of concern
Northern bat	Species of concern
Rafinesque's big-eared bat	Species of concern
Silver-haired bat	Species of concern
Southeastern bat	State endangered
Tricolored bat	Species of concern

buildings (Whitaker and Gummer 2003). Hoary bats roost in the foliage of large mature trees (Perry and Thill 2007) and are known to forage in open habitats (Barclay et al. 1999). Little brown bats typically forage over water and wet habitats (Barclay and Brigham 1991) and are known to roost in trees (Crampton and Barclay 1998), but tend to roost mostly in buildings (Whitaker and Hamilton 1998). The northern bat typically roosts in cracks, crevices, and under the bark of trees (Carter and Feldhamer 2005) and many of the forested areas within the proposed project appeared to be higher quality habitat for northern bats (Sheets 2010). Silver-haired bats forage over streams or wetlands based on their diet (Whitaker 1972) and roost in crevices or cavities of trees (Whitaker et al. 2007). The tricolored bat appears to be a generalist species roosting in both foliage and cavities (Veilleux et al. 2003, Yates and Muzika 2006) and forages in a variety of habitats including forested and open area (Helms 2010).

2.0 Study Area and Methods

2.1 Site Description

The Illiana Corridor is a multi-lane highway, which typically follows a west to east direction, starting at I-55 in Will County, Illinois, continuing through Kankakee County, Illinois, and ending at I-65 in Lake County, Indiana. Cardno JFNew conducted a mist net survey on the Indiana portion of the Corridor within Lake County beginning at the Indiana-Illinois state line (approximately 0.5 kilometer (km) or 0.31 miles north of the intersection of South State Line Road and West 169th Avenue) and ending at I-65 (Figure 2-1). This Corridor, also known as the Survey Area, is approximately 19 km (11.8 miles) long, traversing about three-quarters of the way across Lake County, and including a 610 meter (m) (2,000 feet) buffer set from the proposed highway centerline.

The Illiana Corridor is located within the Central Corn Belt Plains Ecoregion (Level III) consisting of prairie communities on glaciated plains. Specifically, the site is within the Illinois/Indiana Prairies Ecoregion which consists of undulating land with dark fertile soils (Level IV). Historically the area was oak-hickory forest and prairie with moist woodlands confined to riparian areas. Today, the primary land uses are agriculture (including soybeans and corn) and some livestock farming (U.S. Environmental Protection Agency 2010).

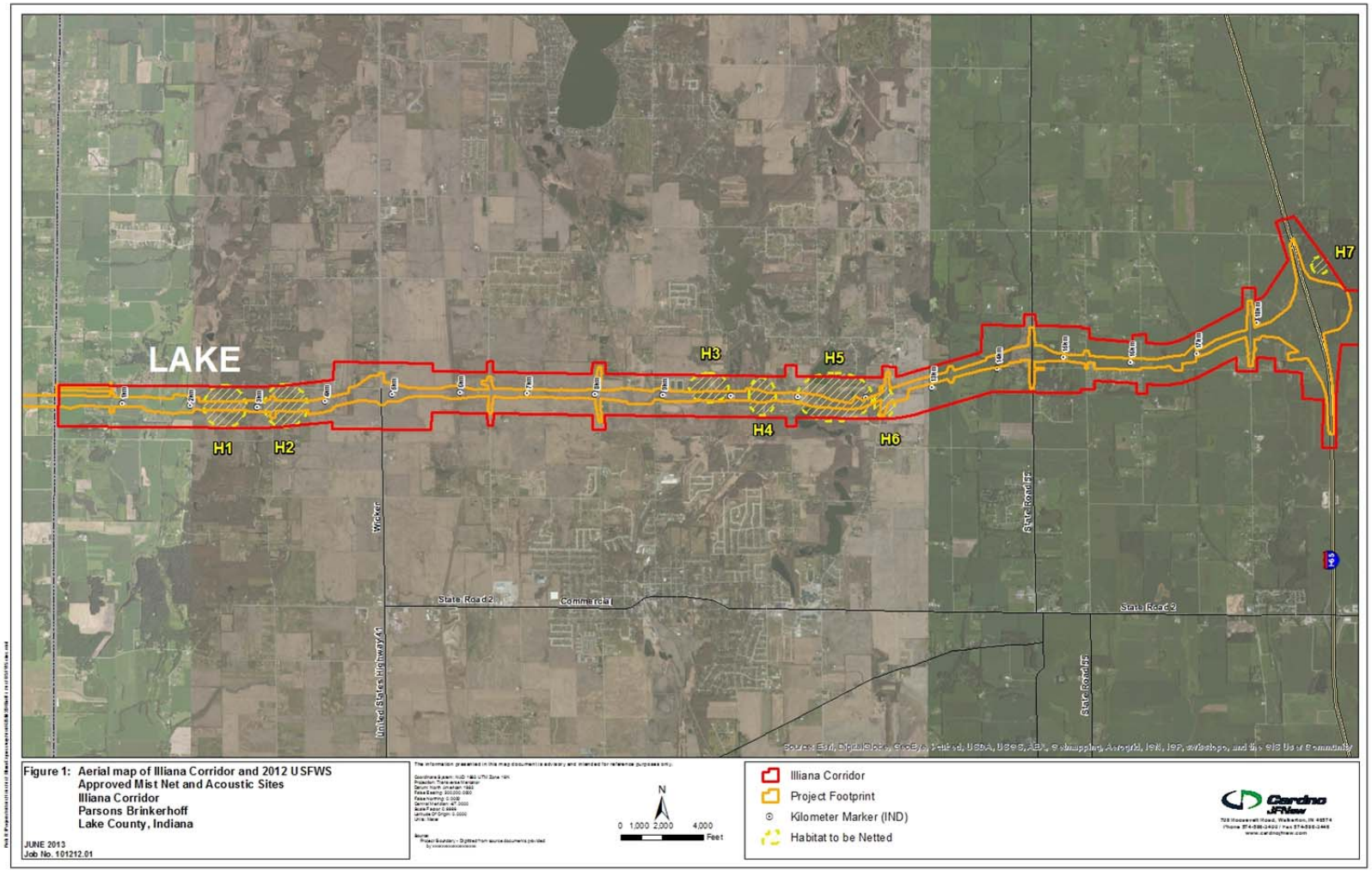
2.2 Mist Net Survey

The Survey Area has approximately six areas of deciduous and mixed forests (i.e., potential habitat for Indiana bats) that are suitable for mist netting. The mist net survey was conducted according to the guidelines in Appendix 5 of the "Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision" for linear projects which state that there should be one net site for every kilometer of potential habitat (USFWS 2007). The location and number of mist net sites were submitted for review and comment by the USFWS (Figure 2-1).

Mist nets made from 50-denier nylon or 75-denier polypropylene (Avinet) of varying lengths were strung between poles 20-30 feet high and were placed in optimal areas (e.g., roads, trails, streams, and edges) to capture bats in wooded habitat. Bats were sampled at each net site on two nights for five hours each night, weather permitting, resulting in four net-nights per site. Nets were checked at 10-minute intervals. Mist net sites were assigned a code including a project abbreviation (IE), the letter "N" for net site, and a number (e.g., IEN1). Individual nets were assigned the same code but with an additional letter (e.g., IEN1A). Net locations were marked with a GPS unit (Garmin Dakota 10).

Captured bats were identified to species based on morphological characteristics before being sexed and aged; age was determined by the degree of ossification of the phalangeal joints. For adult females, reproductive stage was noted as pregnant, lactating, post lactating, or non-reproductive. Males were described as scrotal or

Figure 2-1. Arial Map of the Lake County, Indiana Survey Area and USFWS Approved Mist Net and Acoustic Sites



non-scrotal based on whether the testes were descended. Other morphological characteristics were noted for each individual including weight and right forearm length as measures of size, and a wing-damage index to determine if bats had been infected with WNS (Reichard 2009).

Surrounding habitat conditions and moon phase were noted for each site. Weather conditions (wind direction, wind speed, cloud cover, temperature, and relative humidity) were monitored hourly during each night. If there was sustained rain (over 45 minutes), thunderstorms, and/or if the temperature was below 10 degrees Celsius (°C) (50 degrees Fahrenheit (°F)) the net night was canceled and bats were re-surveyed at that site. All netting was conducted following the bat handling/disinfection protocols for summer field studies (USFWS 2007 and 2012).

2.3 Supplementary Acoustic Monitoring

To supplement the mist-netting survey, acoustic monitoring was conducted during the 2012 survey. Acoustic monitoring couples an ultrasonic detector and a device that records files containing sounds produced by echolocating bats. These sounds can then be analyzed to determine the number of passes made by bats (hereafter, pass), which is an index to the level of activity by bats at a site. A pass is a sequence of echolocation pulses that are the individual sounds emitted by a bat. Passes often can be identified to species or a group of species by analyzing the shape, structure, frequency, and sequence of pulses (O'Farrell et al. 1999). Acoustic monitoring cannot determine the presence or absence of an individual bat, nor can it determine if multiple passes were produced by one bat flying by the detector multiple times or multiple bats flying by once. Sounds of similar species such as some species in the genus *Myotis* may overlap or morph into similar patterns in cluttered environments making identification difficult (Krusic and Neefus 1996). Similarly, passes of big brown and silver-haired bats overlap both in frequency and structure making them difficult to separate, and so passes from these bats were labeled as one group (Betts 1998). Furthermore, acoustic recordings are not currently accepted by the USFWS (2007) to determine presence or absence of the Indiana bat. Although acoustic sampling cannot replace mist-netting and is not the accepted method for determining presence or absence of a species of bat, acoustic sampling is a valuable supplement to mist-netting surveys.

Acoustic surveys were conducted with an ANABAT system (SD2, Titley Scientific). To reduce variability in sensitivity among units, each detector was calibrated using a modified version of the methods discussed in Larson and Hayes (2000). Detectors were placed individually on a table about 1-meter (m) (3.3 feet [ft]) high in an office room. An ANABAT Chirper (Titley Scientific) that produced sound at 40 kilohertz (kHz) was placed 9 m (29.5 ft) directly in front of each detector. Each detector's sensitivity was set to one, and the detector and Chirper were turned on. The sensitivity of the detector was adjusted until a clear continuous signal was heard. The sensitivity of each detector was calibrated to the detector with the lowest sensitivity.

A single acoustic detector was placed approximately 100 m (328.1 ft) from each net site located in an open area (e.g., edge of ponds or fields) that was not ideal for mist-netting. Detectors were deployed for two nights (same nights as mist nets) and ran from dusk to sunrise on the first night and from dusk to after the mist net survey was finished on the second night. Detectors were protected from the elements by a plastic storage box with a 45 degree polyvinylchloride elbow extended from one side to direct sound waves to the microphone (Figure 2-2). The boxes were placed on tripods at about 1.2 m (4 ft) from the ground and placed away from vegetation in an optimal direction to record bats. Each detector site was assigned a code including a project abbreviation (IE), the letter "A" for acoustic site, and a number (e.g., IEA1). Detector locations were marked with a GPS unit (Garmin Dakota 10).

Figure 2-2. Example of Acoustic Detector Weatherproofing

Following each night's mist-netting survey, acoustic recordings were analyzed using appropriate software (AnalookW, Titley Scientific). The first step in the analysis was to search for possible passes by Indiana bats by applying a modified version of the Kentucky Method (USFWS and Kentucky Division of Wildlife Resources 2009), which uses algorithms to filter out noise and calls made by other species of bats. If the analysis

indicates a potential pass by an Indiana bat, the Kentucky Method requires that mist-netting must be conducted for one additional night at that site.

All recorded files were then visually examined and classified as noise or bat-generated sounds. If sounds were produced by bats, the file was assigned to a particular species or group of species. These categories were big brown/silver-haired bat, myotis species, tricolored bat, red bat, hoary bat, evening bat, unidentified with high frequency (minimum frequency of ≥35 kHz), or unidentified with low frequency (minimum frequency of <35 kHz). Only passes that contained at least two clear pulses generated by a bat were included in the two unidentified categories. For assignment to a more specific group, a minimum of three clear pulses was required.

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3.0 Results

3.1 Mist Net Survey

A total of six sites (24 net nights) were surveyed from 30 July to 4 August, 2012 and 30 May to 1 June, 2013 (Table 3-1, Figure 3-1 through Figure 3-4). A total of 26 bats (Table 3-2) were captured consisting of three species: eastern red bat, big brown bat, and northern bat. An equal amount of females and males and more adults than juveniles were captured. The reproductive conditions of bats caught varied with 53 percent non-reproductive male and females, 21 percent scrotal males, 16 percent post-lactating females, 5 percent pregnant females, and 5 percent lactating females. All net sites had at least one capture except site IEN3 had zero bat captures. Weather during the survey consisted of warm humid nights during 2012 and cool nights in 2013. Appendix A contains photographs of netting sites and Appendix B includes representative photographs of species captured.

The bats caught were rated using Reichard's Wing-damage Index (2009) with 78 percent of the scores "zero" (no membrane damage), and 22 percent were "one" (<50 percent of membrane scaring/depigmented). Over all, bats caught appeared healthy with none that showed signs of WNS or higher wing-damage scores (>50 percent wing scaring or necrotic damage)

Table 3-1. Configuration and Habitat of Net Sites during Mist Net Survey

Site	Net	Net Length and Height (ft)	Habitat
IEN1	A	20x30	Upland road/trail
	B	40x30	Upland road/trail
IEN2	A	30x30	Upland road/trail
	B	20x30	Upland road/trail
IEN3	A	30x20	Pond
	B	30x20	Pond
IEN4	A	20x20	Stream
	B	30x30	Upland road/trail
IEN5	A	20x20	Upland road/trail
	B	20x20	Upland road/trail
IEN6	A	20x20	Lowland road/trail
	B	30x30	Lowland road/trail

Table 3-2. Bat Totals at each Net Site

Site	Eastern Red	Big Brown	Northern	Total
IEN1	2	0	0	2
IEN2	0	2	0	2
IEN3	0	0	0	0
IEN4	6	2	2	10
IEN5	6	4	0	10
IEN6	1	1	0	2
Total	15	9	2	26

3.2 Supplementary Acoustic Monitoring

Five acoustic sites were surveyed during 2012 (Table 3-3, Figure 3-1 through Figure 3-4) that resulted in 2,551 files in which 2,809 sounds were recorded (each file may contain more than one type of sound). Of these, 2,049 (73 percent) were identified as bat passes and 760 (27 percent) as noise. Of the bat passes recorded, 1,171 (57 percent) were identified to species or group and 878 (43 percent) were unidentified bat passes. The species/group with the most passes was the big brown/silver-haired bat group (567), followed by unidentified high frequency group (537), red bats (510), unidentified low frequency group (341), myotis species (56), hoary bats (19), evening bat (19), and tricolored bat (0) (Table 3-4). All detectors successfully functioned for all the nights deployed. Appendix A contains photographs of acoustic sites.

Table 3-3. Habitat Where Each Detector was Placed, Nights in Use, and the Direction the Detector Faced

Site	Number of Nights Deployed	Detector Nights	Direction Faced	Habitat
IEA1	2	2	South	Pond/old field
IEA2	2	2	Southeast	Old field/wetland/forest edge
IEA3	2	2	East	Forest corridor
IEA4	2	2	East	Forest edge/lawn
IEA5	2	2	Southeast	Forest edge/lawn

Table 3-4. Bat Passes Identified at Each Site

Site	Big Brown/Silver-haired	Unidentified High Frequency	Red	Unidentified Low Frequency	Myotis Species	Evening	Hoary	Tricolored	Total
IEA1	476	70	156	112	42	19	18	0	893
IEA2	36	232	140	10	14	0	0	0	432
IEA3	0	9	11	5	0	0	0	0	25
IEA4	15	184	189	52	0	0	1	0	441
IEA5	40	42	14	162	0	0	0	0	258
Total	**567**	**537**	**510**	**341**	**56**	**19**	**19**	**0**	**2,049**

Figure 3-1. Mist Net and Acoustic Locations within the Lake County, Indiana portion of the Illiana Corridor.

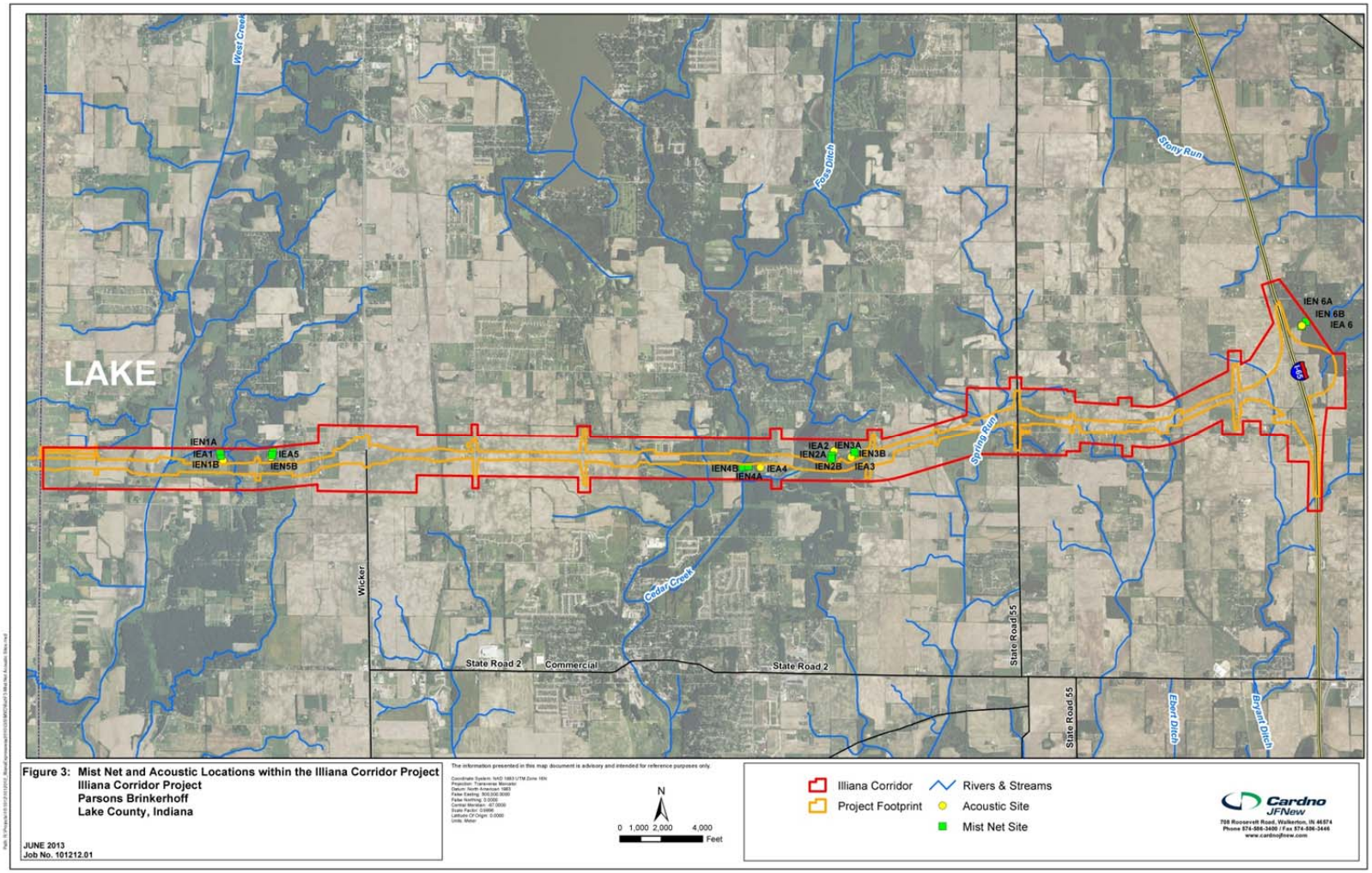


Figure 3-2. Mist Net Sites IEN1 and IEN5

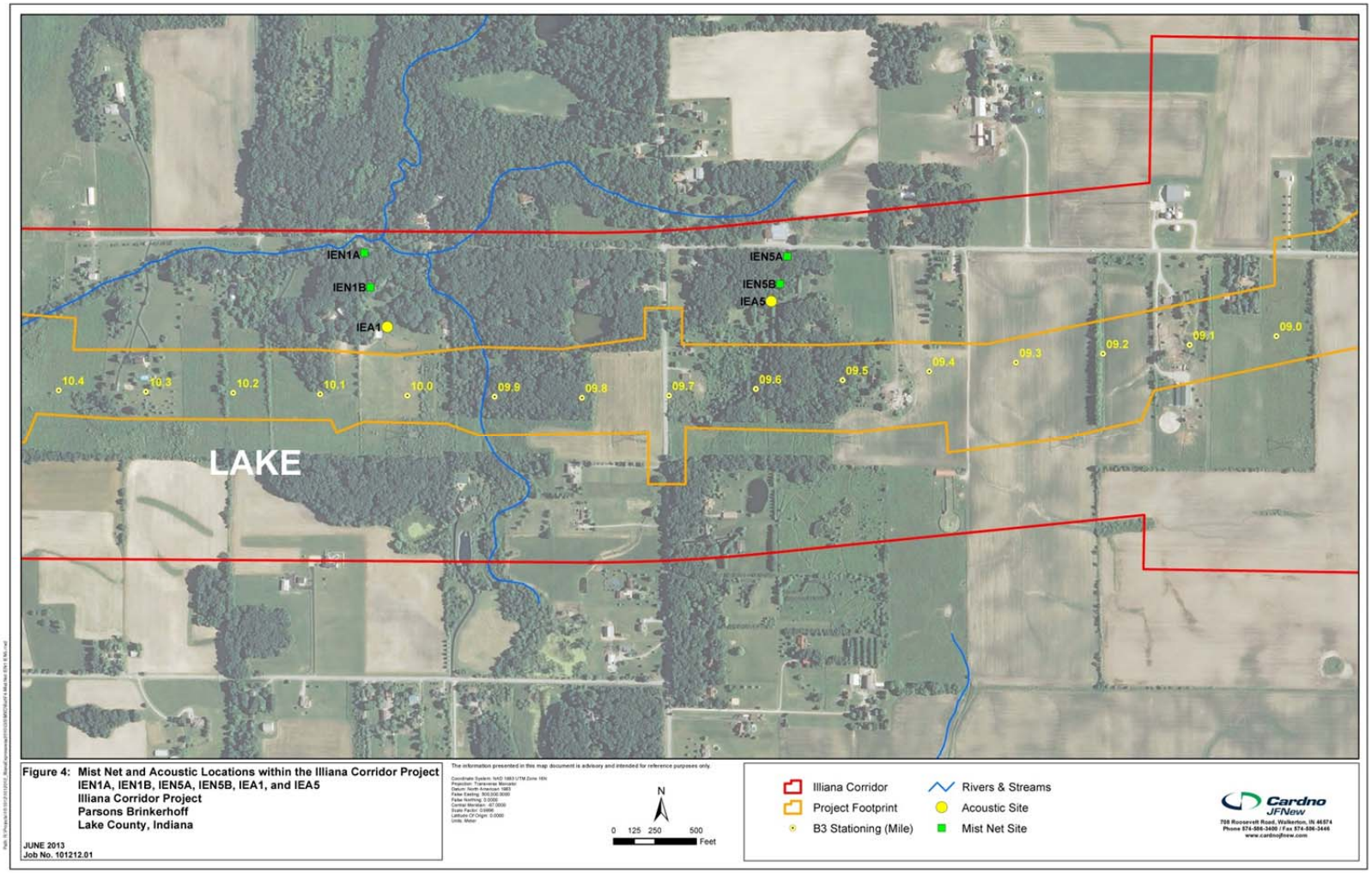


Figure 3-3. Mist Net Site IEN4

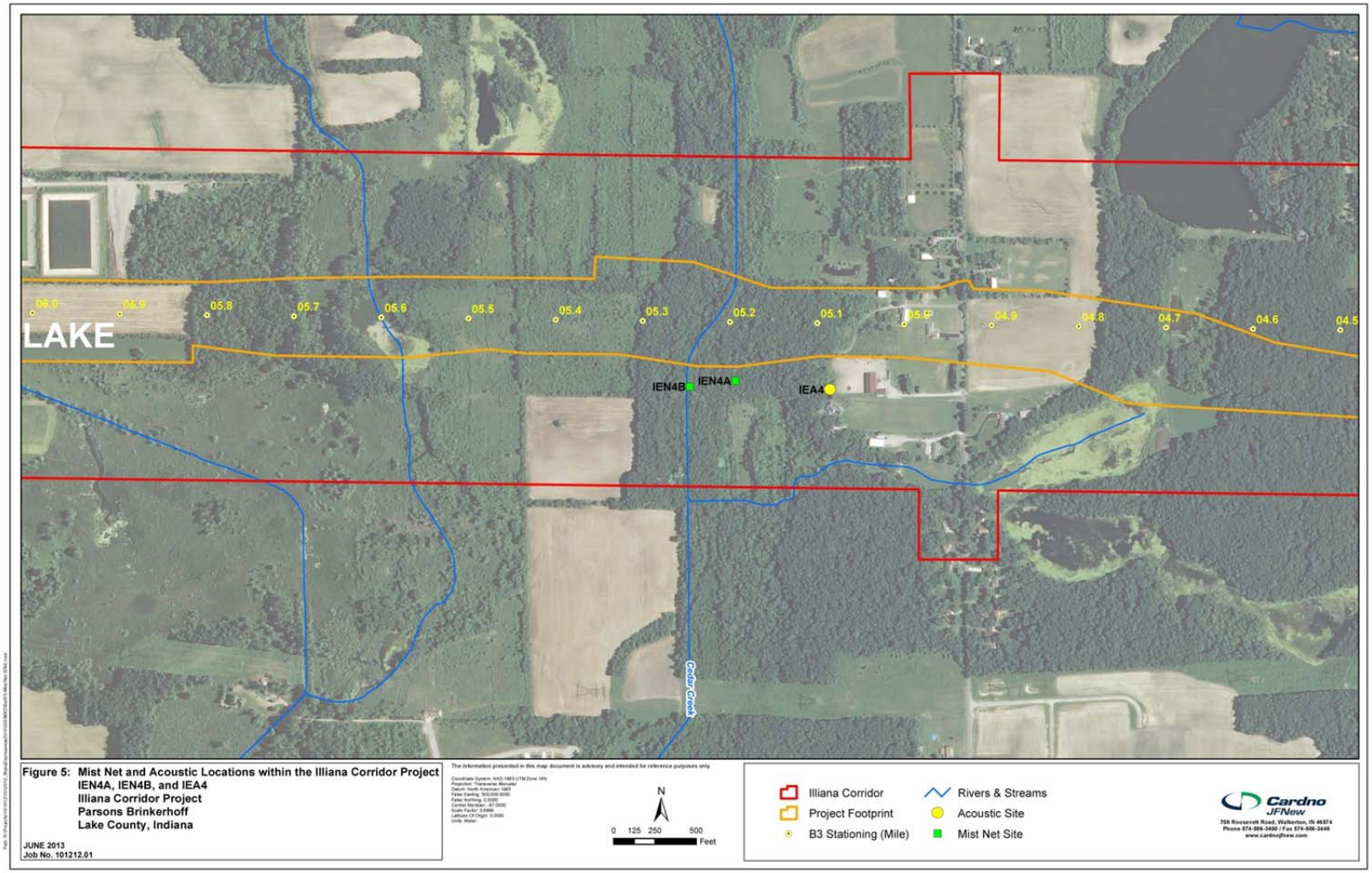


Figure 3-4. Mist Net Sites IEN2 and IEN3

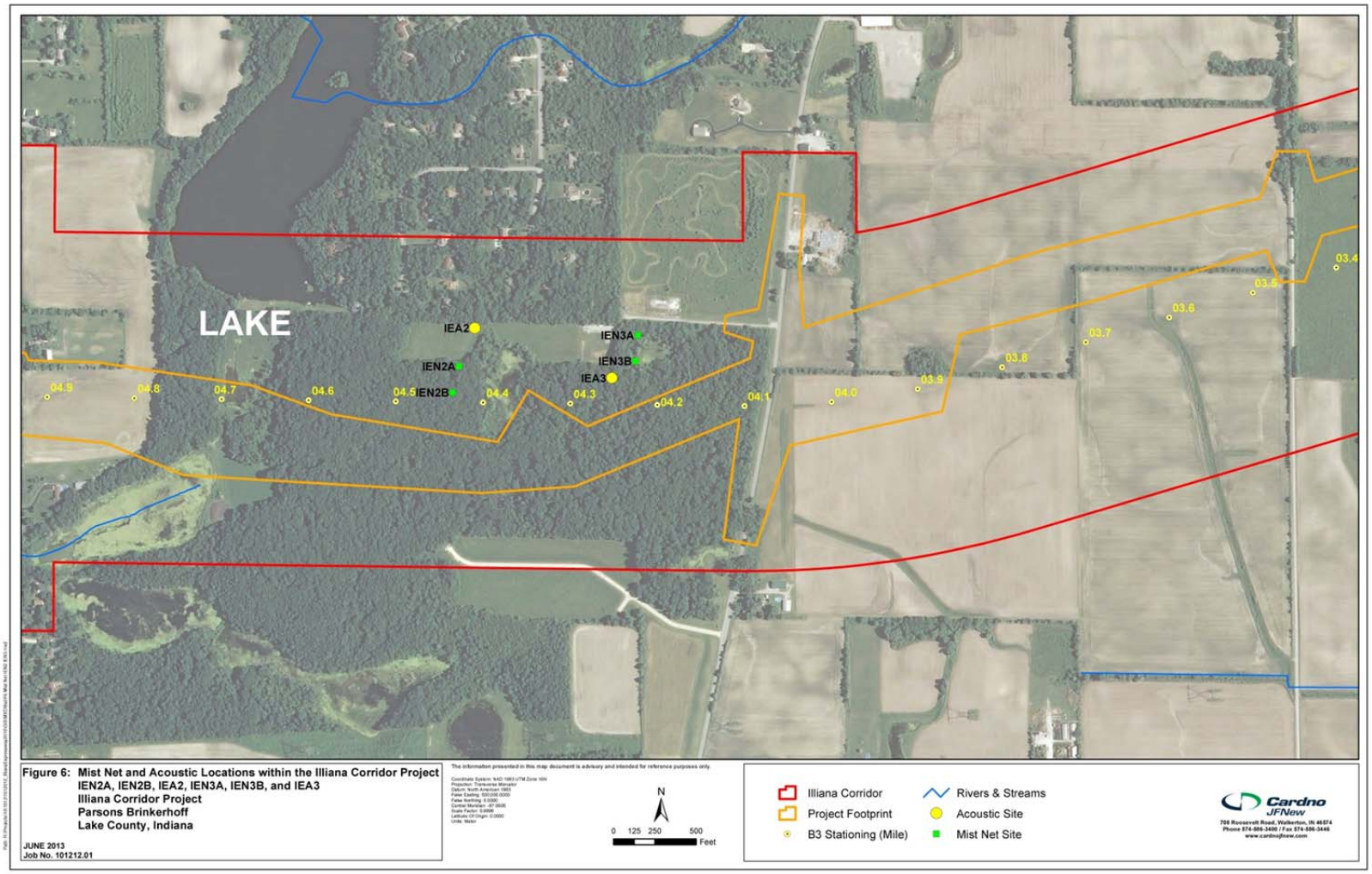
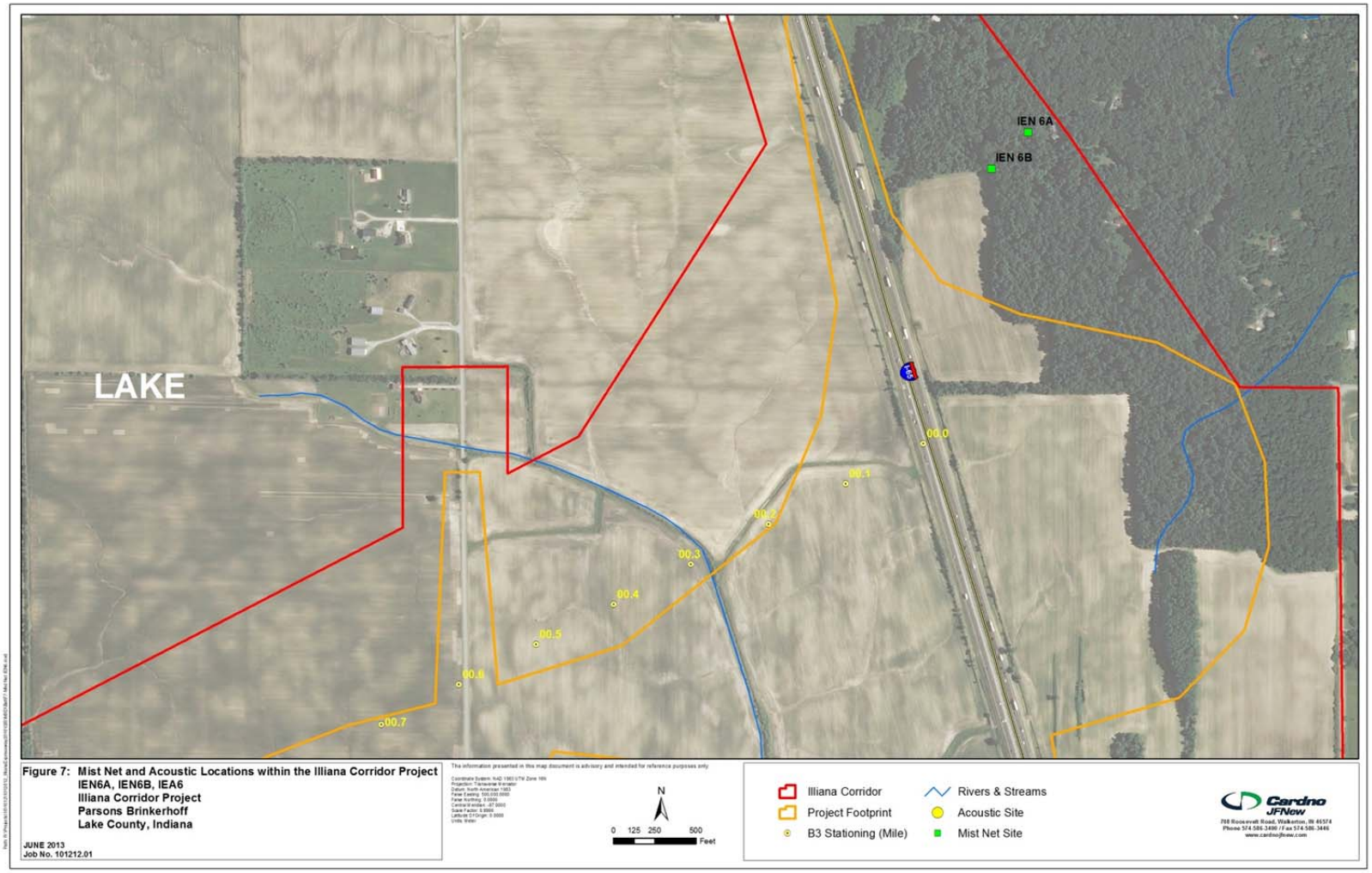


Figure 3-5. Mist Net Sites IEA6



4.0 Discussion and Conclusions

4.1 Mist Net Survey

The mist-netting survey resulted in the average capture of 1.1 bats per net-night. The Indiana bat was not captured even though the guidelines to specifically capture Indiana bats were followed suggesting the probable absence of the species within the Survey Area during the summer residency period of 2012 and 2013. Mist nets were placed in the highest quality habitat available such as corridors through mature interconnected forests and water sources within the 610 m (2001 foot) buffer.

The eastern red bat was the most abundant bat caught (58 percent), and along with big brown and little brown bats, is one of the three most abundant species in Indiana (Whitaker et al 2007). Eastern red bats prefer open habitats for foraging and roost in foliage of trees (Hutchinson and Lacki 1999, Walters et al. 2006) which are both abundant on the landscape. The big brown bat was the second most caught bat species (33 percent) and is one of the most common species in the eastern United States (Whitaker and Hamilton 1998). Big brown bats often forage in agricultural fields and roost in buildings (Duchamp et al. 2004). Big brown bats are likely abundant due to their adaptability to human presence, particularly from how humans have changed the landscape. The northern bat was the third most caught species (8 percent). Northern bats typically forage and roost in forested areas (Owen et al. 2003) and many wooded areas within the proposed project appear to be high quality habitat, i.e., interconnected forests that are dense in structure (Sheets 2010).

The hoary bat, evening bat, tricolored bat, and little brown bat were not caught during this survey but are known to occur in Lake County and adjacent counties (Whitaker et al. 2007). A possible reason hoary bats were not captured is they typically forage at higher altitudes and in open habitats (Barclay et al. 1999) where mist nets are ineffective. Evening and tricolored bats may be rare in northwestern Indiana (Whitaker et al. 2007) and thus unlikely to be captured. The reason the little brown bat was not caught is unknown. The little brown bat is a common species in Indiana and roosting and foraging habitat appeared to be present on and around the proposed project corridor.

Reproductive condition of bats varied with the majority of the captures being non-reproductive individuals consisting of males and juveniles. The geographic location of surveys and period of netting may affect sex and age ratios, but why more males were caught than females during this survey is unknown. Pregnant females were not caught because the survey was conducted during the period when juveniles are volant.

4.2 Supplementary Acoustic Monitoring

All identified bat passes were of species or groups expected to occur in Lake County. Big brown/silver-haired passes made up the majority (28 percent) of the total 2,049 identified bat passes. The big brown/silver-haired group likely consists of only big

brown passes because silver-haired bats are not known to occur in northern Indiana during the summer (Whitaker et al. 2007). The eastern red bat passes were the second most identified bat pass (25 percent). Both eastern red and big brown bats are likely common within the proposed project, but it is unclear why red bats were caught in higher numbers by mist nets and big brown bats had a higher acoustic activity.

The myotis group made up the third most commonly identified bat passes on the proposed project (3 percent). The myotis group could consist of passes from Indiana bat, little brown bat, and northern bat, but the myotis passes can be confused with other high frequency bats, especially among the *Myotis* genus (Krusic and Neefus 1996). The Kentucky Method filter did not identify any bat pass as a potential Indiana bat, and with zero captures it is unlikely Indiana bats produced any of the recorded myotis passes. The little brown bat could have been recorded within the proposed project and is known to occur in Lake County although the species was not captured during the mist net survey. The northern bat was caught during the mist net survey and is likely a source of the myotis passes recorded within the proposed project.

Evening and hoary bats each made up only 1 percent of recorded passes, and the tricolored bat was not detected at all. Evening bats are rare in northern Indiana and the structure of evening bat passes do overlap with eastern red bat passes and thus could have been mislabeled. Hoary bats passes have a very distinctive structure and are typically easy to identify visually. The tricolored passes have distinct characteristics that allow their passes to be visually identified but are not abundant in northern Indiana and may not occur in large numbers in Lake County (Whitaker et al. 2007).

Not all calls can be identified to a specific group or species and are labeled as unidentified (high or low frequency). The unidentified high frequency group can include fragments of eastern red bat, evening bat, tricolored bat, or myotis group that could not be confidently identified to species. The unidentified low frequency group can include big browns and hoary bat passes that could not be confidently identified to species. Some bias exists when visually analyzing bat passes of species such as eastern red and hoary bats because while they have some distinct call structures, fragments of their passes can be confused with those of other species.

4.3 Impacts on the Indiana Bat

The Illiana Corridor is not expected to significantly impact Indiana bat hibernacula. There are no known hibernacula within the Survey Area. Black Ball Mine in LaSalle County, Illinois, is the closest priority hibernacula (Priority 2), approximately 135 kilometers (85 miles) to the west of the Indiana-Illinois border (USFWS 2007).

Construction of the Illiana Corridor will impact potential Indiana bat foraging and roosting habitat. There are areas that appear to be higher quality roosting and foraging habitat, i.e., interconnected woodlots with corridors and dead trees (Sparks et al. 2005) within the project corridor. The Indiana bat was not captured during the mist net

survey suggesting the probable absence of the endangered species within the Survey Area during the summer residency period.

The mist netting survey suggests probable absence of the Indiana bat at the project site during the summer residency. However, the Indiana bat could occur there during migration. It is unclear if the proposed project will impact the Indiana bat during migration. The specifics of the migration habits of the Indiana bat are not well known. It was previously thought that Indiana bats and other bat species followed landscape features such as rivers during migration, but there is evidence that Indiana bats can also migrate over large areas of apparently featureless landscapes such as agricultural fields (USFWS 2010).

4.4 Impacts on Other Bat Species

Overall, species that are not state or federally protected (hoary, red, silver-haired, big brown, and tricolored) could be impacted by the Illiana Corridor. The Illiana Corridor crosses many different habitats including: agricultural fields, residential areas, old fields, ponds, streams, forest, wetlands, and prairie remnants, which are all potentially used by bats for foraging and roosting. Furthermore, bats appear to avoid crossing roadways especially if vehicles or the noise of vehicles are present (Bennett and Zurcher 2012). Once implemented, the Illiana Corridor may become a physical barrier to bats, excluding them from foraging or roosting habitats. In addition to impacting bats' summer foraging and roosting habitat, the facility may affect migration, and may impact short-distance migrant's hibernacula (i.e., buildings for big brown bat).

The little brown bat and northern bat are both currently being considered for threatened or endangered status by USFWS. The northern bat was present on site and many of the woodlots appeared to be high quality habitat for roosting and foraging (Sheets 2010). The little brown bat was not caught during the mist net survey but is a common species in Indiana (Whitaker et al. 2007). Evening bats, a state endangered species, were not caught and may be rare in forested uplands, where the Illiana Corridor occurs.

4.5 Recommendations

Based upon the results of the various surveys conducted to identify the Indiana bat within the Survey Area, the species it is probably absent from the area. However, the following measures should be considered to reduce impacts to potential foraging and roosting habitat of all bats that are present within the Corridor:

1. Select the No-Action Alternative. The No-Action Alternative will not alter the foraging habitats of bat species in the Survey Area.
2. Avoid removing trees in the summer between 1 April and 29 September. The removal of trees will likely occur in wooded areas during the initial stages of construction. During migration and summer maternity season the removal of trees could negatively impact bats that may use trees.

3. Remove trees in the winter between 1 October and 31 March. Indiana bats and other bat species do not usually occupy trees during the winter and are in caves hibernating or have migrated. Removing potential roost trees and other trees during the winter will not directly harm or harass species of concern. .
4. Geographic/physical barrier mitigation. The Illiana Corridor could be a geographic or physical barrier to bats during foraging and possibly during migration. To allow for bats to commute across roadways linear wooded areas (i.e., wooded fence rows or streams) should be enhanced or reestablished creating a "canopy corridor" above the vehicles. Linear wooded areas will also dampen the noise of vehicles which will lessen the disturbance to bat species when crossing roadways (Bennett and Zurcher 2012).

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Appendix A

Mist Net and Acoustic Site Photographs

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Site IEN1 Net A

Site IEN1 Net B

Mist Net Site Photographs
Illiana Corridor Project
Parsons Brinkerhoff
Lake County, Indiana

File# 1012012.01

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Site IEA1 Acoustic

Site IEN2 Net A

Mist Net Site Photographs
Illiana Corridor Project
Parsons Brinkerhoff
Lake County, Indiana

File# 1012012.01

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Site IEN2 Net B

Site IEA2 Acoustic

Mist Net Site Photographs
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Parsons Brinkerhoff
Lake County, Indiana

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Mist Net Site Photographs
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Site IEN4 Net A

Site IEN4 Net B

Mist Net Site Photographs
Illiana Corridor Project
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Lake County, Indiana

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Site IEA4 Acoustic

Site IEN5 Net A

Mist Net Site Photographs
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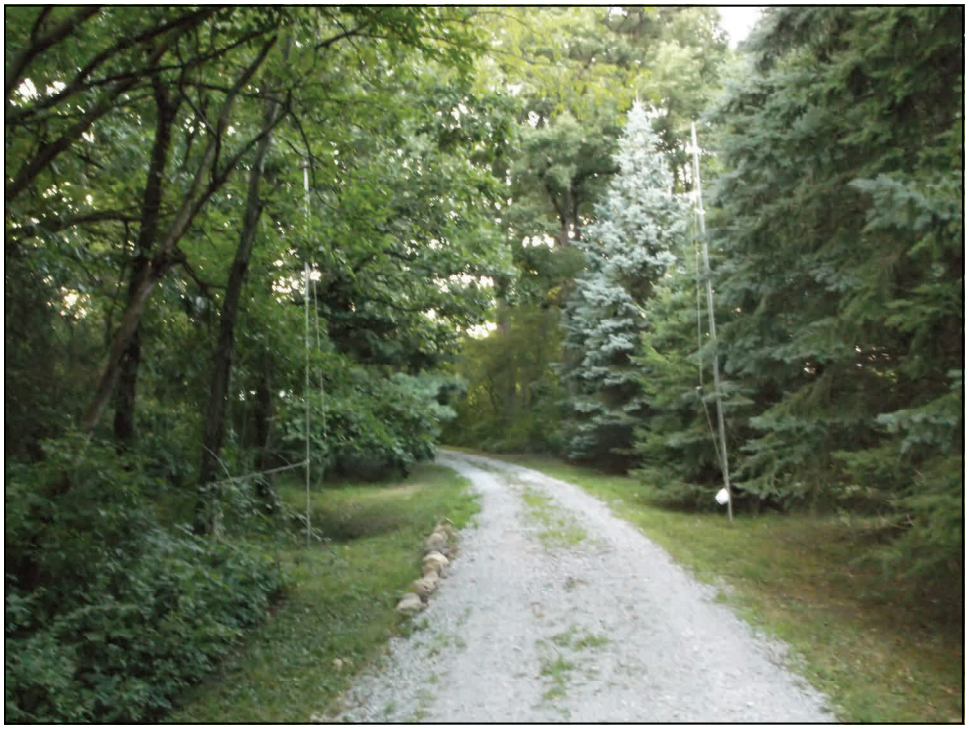

Site IEN5 Net A

Site IEA5 Acoustic

Mist Net Site Photographs
Illiana Corridor Project
Parsons Brinkerhoff
Lake County, Indiana

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Site IEN6 Net A

Site IEA6 Net B

Mist Net Site Photographs
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Appendix B

Bat Species Photographs

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Northern bat (*Myotis septentrionalis*)

Eastern red bat (*Lasiurus borealis*)

Bat Photographs
Illiana Corridor Project
Parsons Brinkerhoff
Lake County, Indiana

File# 1012012.01

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Big brow bat (*Eptesicus fuscus*)

Bat Photographs
Illiana Corridor Project
Parsons Brinkerhoff
Lake County, Indiana

File# 1012012.01

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Appendix C

Mist Net and Acoustic Datasheets

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BAT CAPTURE DATA

Project Name: Illiana Expressway	Date: 7/30/12	Biologists: JJS TMS	Page 1 of 2
Project #: 10120R.01 / Site Name/#: IEM1	State: IN	County: Lake / GPS Unit: Bat1	Camera: Bat1

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	41° 19' 03.5"	87° 29' 42.2"	6m	30ft	2000	0103	4201-4211
B	NN	41° 19' 06.4"	87° 29' 41.7"	12m	30ft	1945	0100	4212-4214

Capt.#	Net #	Species (Latin name only)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
1	B	Lasiurus borealis	2240	Ad	F	PL	15.25	42	0	—	

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA (continued)

Project # 012012.01	Site Name/#: IEN1	Date: 7/31/12	Biologists: JJS TMS	Page 2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)
2000	27.0	0	—	50%	66%
2100	22.4	0	—	0%	80%
2200					
2300	20.1	0	—	0	95
0000	19.5	0	—	0	99
0100	19.0	0	—	0	95

Moon Phase: Waxing Gibbons	Rise	Set
Moon	19:55 pm	05:06
Sun	06:43	21:08

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA

Project Name: Indiana Expressway	Date: 7/31/12	Biologists: JJS TMS	Page 1 of 2
Project #: 0N012.01 / Site Name/#: FEN1	State: IN	County: Lake / GPS Unit: Bat1	Camera: Bat1

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	41° 19' 08.5"	87° 29' 42.2"	6m	30ft	1040	0110	4206 - 4211
B	NN	41° 19' 16.4"	87° 29' 41.7"	12m	30ft	1050	1108	4212 - 4214

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
1	A	Lasiurus borealis	2212	Ad		NR	11.5	40	0		

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

1 Northern Cardinal

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BAT CAPTURE DATA (continued)

Project # 10R012.01	Site Name/#: IEN1	Date: 4/23/12	Biologists: JJS TMS	Page 2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)
2000	31.5	0	—	80	60
2100	25.4	0	—	60	80
2200	23.6	0	—	40	84
2300	23.9	0	—	0	87
0000	23.2	0	—	0	88
0700	23.2	0	—	0	88

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Moon Phase: Waxing Gibbous	Rise	Set
Moon	02:58	18:10
Sun	06:44	20:09

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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NET SITE HABITAT DESCRIPTION

Project #: 1012017.01 **Date:** 7/3/12 **Biologists:** JSS TMS

Project Name: ILLIANA EXPRESSWAY **Site Name/#:** IEN1

State: IN **County:** Lake **USGS Quad:** —

Camera #: Bat1 **Picture #:** 4216 - 4214 **GPS Unit #:** Bat1 **Waypoint #:** ___

Coordinates: 41° 19' 08.5" 87° 29' 47.2"

Distance to closest water source (meters): 10 Type of water source: Creek

Water source name: N/A

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS):

Bank Height: _____meters Channel Width: _____meters Stream Width: _____meters

N/A Substratum: ___Bedrock ___Boulder ___Cobble ___Gravel ___Sand ___Silt/Clay

Still Water Present (Y/N): _____ Average Water Depth: ____m or cm Clarity (H,M,L):____

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh)	Subdominant Canopy Species (< 40 cm/16" dbh)
Quercus alba	Morus spp
Acer saccharum	Acer negundo
Prunus serotina	Quercus alba

Estimated dbh range: Lg: 45 Sm: 16 Estimated dbh range: Lg: 16 Sm: 3

Relative Abundance of Dominant vs. Subdominant (ratio): 1:10

Estimated Canopy Closure:	___Closed	✓Moderate	___Open
Roost Tree Potential consists of:	___Large Trees	___Snags	✓Both
Roost Tree Potential for the Area is:	___High	✓Moderate	___Low
Subcanopy Clutter:	___Closed	✓Moderate	___Open
Subcanopy Comprised Largely of:	✓Lower Branches of Canopy Trees	✓Saplings	✓Shrubs

Common Subcanopy Species: Toxicodendron radicans, Prunus serotina, Quercus spp.

Conversions
3 feet ≈ 1 meter
2 inches ≈ 5 cm

Habitat Description: Net A across siphill driveway with overhanging canopy. Net B between two large orchard trails with firm access drive between them

Check all that apply:

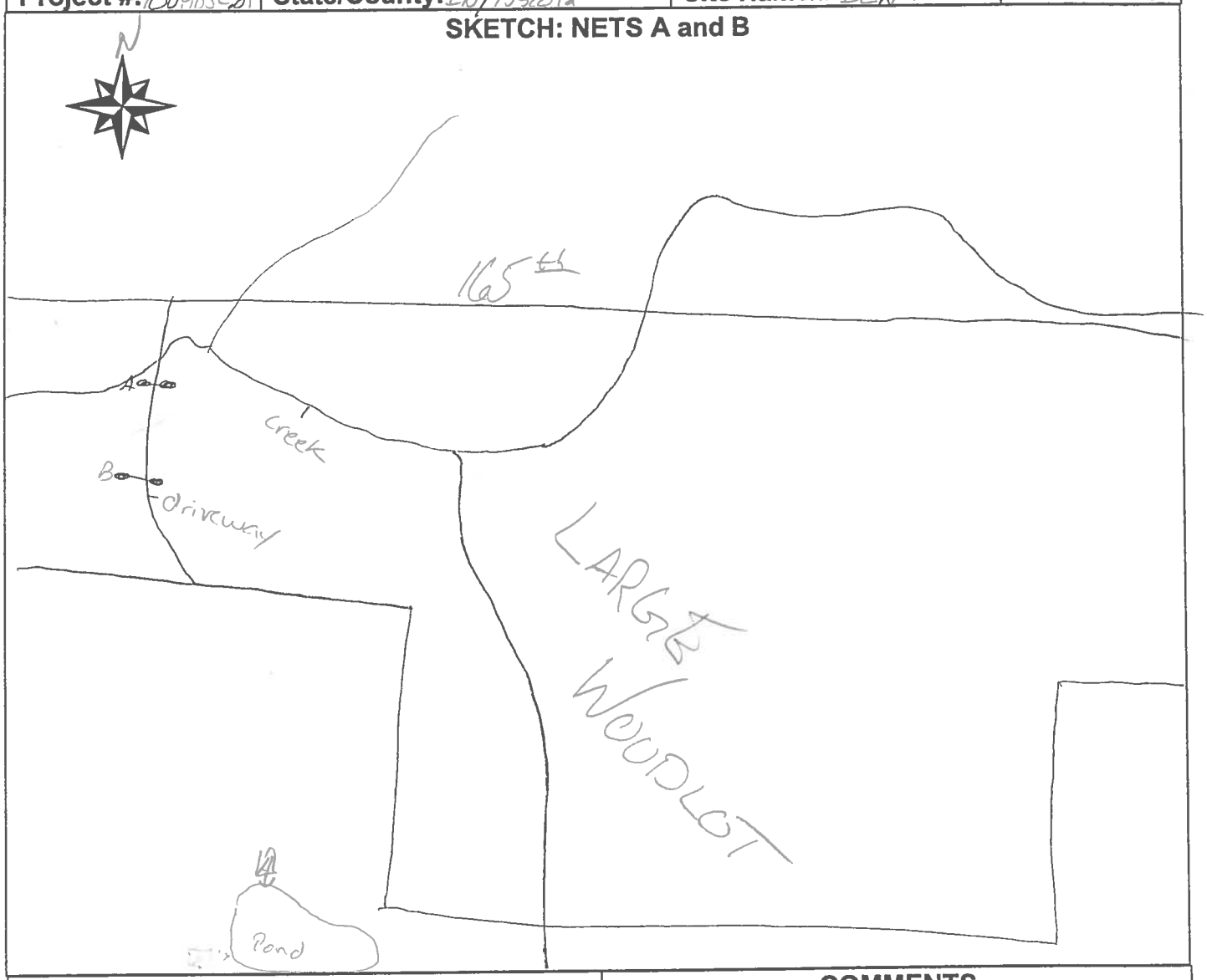
✓Mature Upland Forest	__Recently Logged Forest	__Crop/Pasture Land	__Shrub/scrub Swamp
__Young Upland Forest	__Pine Plantation	__Stream/River	__Vernal Pool
__Mature Lowland Forest	__Woodlot/ForestEdge	__Emergent Wetland	__Deepwater Lake/Pond
__Young Lowland Forest	__Old Field	__Forested Swamp	__Other _____

Herbaceous Cover: ___ Sparce ✓Moderate ___Dense

NET SITE HABITAT DESCRIPTION (continued)

Project #: 100905201	State/County: IN/Tuscola	Site Name/#: IEN1	Initials: TMS

SKETCH: NETS A and B



LEGEND	COMMENTS
Nets: ●——●	

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ANABAT DATA

Project Name: Illiana Expressway / N 41°19'04.0" W 87° 29' 49.4"			
Project #: 1012012.01		**Biologists:** JJS TMS	
State: IN	**County:** Lake	**Site Name/#:** IEA1	
Camera #: Bat1	**Picture #:** 4219-4222	**GPS Unit #:** Bat1	**Waypoint #:** IEA1

Anabat #/CF #	Date	Time on (0000 h)	Time off (0000 h)	Orientation	Sensitivity	Audio Division Ratio	Data Division Ratio	Waterproofing
81216/44	7-30-12	1730	0600	South	5	16	8	PVC
81216/44	7-31-12	1730	0120	South	5	16	8	PVC

Distance to closest water source (meters): 0

Type of water source: Pond

Water source name: N/A

Tree species present

Quercus spp

Juglans nigra

Estimated dbh range: Lg: 26" Sm: 5

Estimated Canopy Closure: ___Closed ___Moderate ✓Open

Roost Tree Potential consists of: ___Large Trees ✓Snags ___Both

Roost Tree Potential for the Area is: ___High ✓Moderate ___Low

Subcanopy Clutter: ___Closed ___Moderate ✓Open

Subcanopy Comprised Largely of: ___Lower Branches of Canopy Trees ___Saplings ✓Shrubs

Habitat Description: Anabat aimed over pond in opening South of woodlot.

Check all that apply:

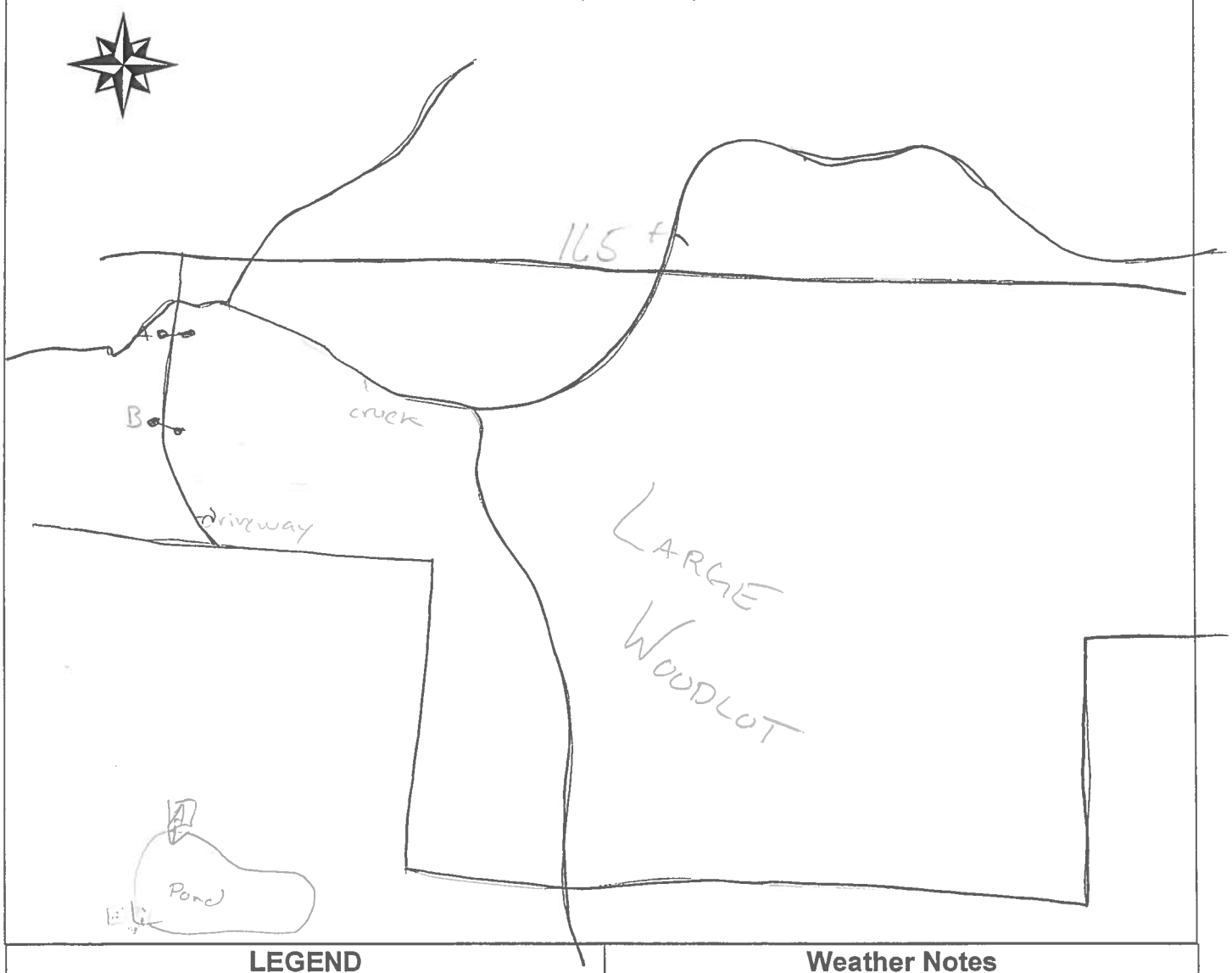
__Mature Upland Forest
__Young Upland Forest
__Mature Lowland Forest
__Young Lowland Forest
__Recently Logged Forest
__Pine Plantation
__Woodlot/ForestEdge
✓Old Field
__Crop/Pasture Land
__Stream/River
__Emergent Wetland
__Forested Swamp
__Shrub/scrub Swamp
__Vernal Pool
✓Deepwater Lake/Pond
__Other _____

Herbaceous Cover: ___ Sparce ✓Moderate ___ Dense

ANABAT DATA (continued)

Project #: 1008087.01	State/County: IN/Tuscola	Site Name/#: IEN 1	Initials: TMS

SKETCH: Anabat, net site, and habitat



LEGEND	Weather Notes
Nets: ●——●	
Anabat: A ➡	

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BAT CAPTURE DATA

Project Name: Illiana E c v	Date:	Biologists: JJS TMS	Page 1 of 2
Project #: 102 1 / Site Name/#: IE	State: IN	County: Lake / GPS Unit: Bat 1	Camera:

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	41°19' 07.9"	8 2 3	9m	30ft	19:50	01:00	7 MB
B	NN	41°19' 06.4"	87° 23' 14.0"	6m	30ft		01:00	

Capt.#	Net #	Species (Latin name only)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
1	A	Eptesicus fuscus	22:14	Ad	F	PL	17.5	46	0	—	

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA (continued)

Project # 1012012.01	Site Name/#: FEIUZ	Date: 8-1-12	Biologists: JJS TMS	Page 2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)
2000	24.3	0	—	0	66
2100	18.5	0	—	0	99
2200	18.3	0	—	0	99
2300	17.5	0	—	0	95
0000	16.1	0	—	0	95
0100	16.1	0	—	0	95

Moon Phase: Waxing Gibbous	Rise	Set
Moon	19:35	05:15
Sun	05:45	20:06

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA

Project Name: Illiana Expressway		Date: 8-2-12	Biologists: —		Page 1 of 2
Project #:	Site Name/#:	State: IN	County: Lake	GPS Unit: Bat 1	Camera: Bat 1

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	41°19' 07.9"	87° 23' 13.5"	9m	30ft	20:00	01:08	7 423
B	NN	41°19' 06.4"	87° 23' 14.0"	6m	30ft	20:00	01:10	4 4

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
1	A		00:33	Jv	M	NR	18.5	46	0	—	

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

or n a – a

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BAT CAPTURE DATA (continued)

Project # 1012012.01	Site Name/#: FEN2	Date: 8-2-12	Biologists: JJS TMS	Page 2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)
2000	23.2	0	—	50%	80%
2100	20.1	0	—	70%	95%
2200					
2300	17.5	0	—	75	75
0000	17.5	0	—	25	95
0100	18	0	—	0	95

Moon Phase: Full	Rise	Set
Moon	20:09	06:24
Sun	05:56	20:05

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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NET SITE HABITAT DESCRIPTION

Project #: 1012012.01 **Date:** 8-2-12 **Biologists:** JJS TMS

Project Name: Illiana Express **Site Name/#:** IEN2

State: IN **County:** Lake **USGS Quad:** —

Camera #: Batl **Picture #:** 4227-4236 **GPS Unit #:** Batl **Waypoint #:** IEN2A

Coordinates: 41°19' 67.9" 87°23' 13.5"

Distance to closest water source (meters): 100 Type of water source: wetland

Water source name: N/A

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS):

Bank Height: _____meters Channel Width: _____meters Stream Width: _____meters

N/A Substratum: ___Bedrock ___Boulder ___Cobble ___Gravel ___Sand ___Silt/Clay

Still Water Present (Y/N): _____ Average Water Depth: ____m or cm Clarity (H,M,L):____

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh)	Subdominant Canopy Species (< 40 cm/16" dbh)
Quercus alba	Prunus serotina
Quercus rubra	Lonicera maackii
Juglans nigra	Carya spp.
Estimated dbh range: Lg: 30" Sm: 16"	Estimated dbh range: Lg: 16" Sm: 4"

Relative Abundance of Dominant vs. Subdominant (ratio): 10:1

Estimated Canopy Closure:	___Closed	✓Moderate	___Open
Roost Tree Potential consists of:	___Large Trees	✓Snags	___Both
Roost Tree Potential for the Area is:	___High	___Moderate	✓Low
Subcanopy Clutter:	___Closed	✓Moderate	___Open
Subcanopy Comprised Largely of:	___Lower Branches of Canopy Trees	✓Saplings	✓Shrubs

Common Subcanopy Species: Lonicera maackii, Rosa multiflora, Prunus serotina

Conversions
3 feet ≈ 1 meter
2 inches ≈ 5 cm

Habitat Description: Nets across mowed trail through large continuous woodlot, with adjacent wetland (currently dry)

Check all that apply:

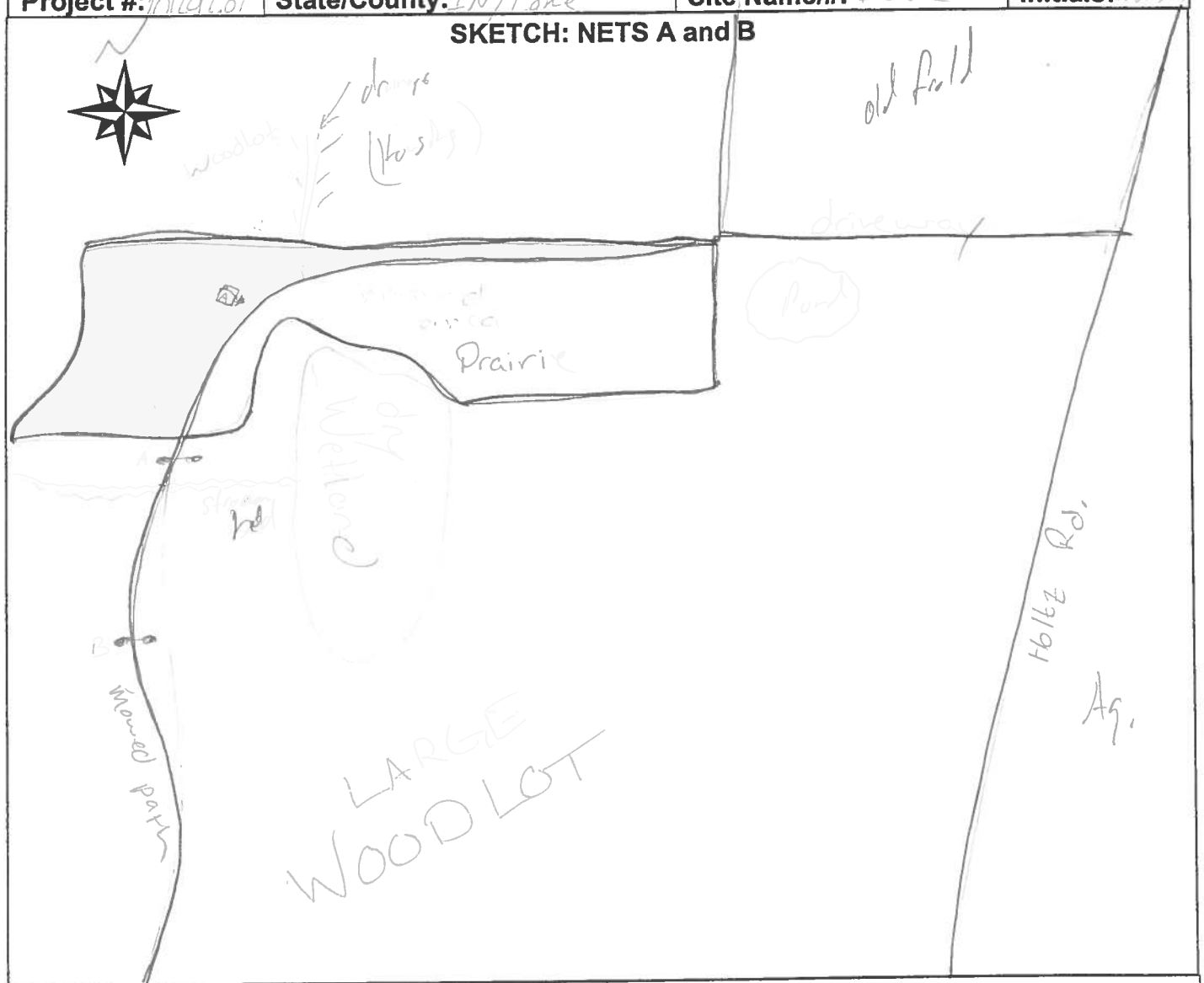
✓Mature Upland Forest	__Recently Logged Forest	__Crop/Pasture Land	__Shrub/scrub Swamp
__Young Upland Forest	__Pine Plantation	✓Stream/River	__Vernal Pool
__Mature Lowland Forest	✓Woodlot/ForestEdge	__Emergent Wetland	__Deepwater Lake/Pond
__Young Lowland Forest	✓Old Field	__Forested Swamp	✓Other wetland

Herbaceous Cover: ___ Sparce ___Moderate ✓Dense

NET SITE HABITAT DESCRIPTION (continued)

Project #: 101292.01	State/County: IN/Lake	Site Name/#: IENR	Initials: TWS

SKETCH: NETS A and B



LEGEND	COMMENTS
Nets: ●——●	

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ANABAT DATA

Project Name: Illiana Expressway		41°19'10.2" 87°23'12.3"	
Project #: 1012012.01		**Biologists:** JJS TAS	
State: IN	**County:** Lake	**Site Name/#:** IEA2	
Camera #: Batl	**Picture #:** 4223 – 4226	**GPS Unit #:** Batl	**Waypoint #:** IEA2

Anabat #/CF #	Date	Time on (0000 h)	Time off (0000 h)	Orientation	Sensitivity	Audio Division Ratio	Data Division Ratio	Waterproofing
81216 / 44	8-1-12	1930	0600	SE	5	16	8	PVC
81216 / 44	8-2-12	1930	0115	SE	5	16	8	PVC

Distance to closest water source (meters): 30 m

Type of water source: Wetland

Water source name: N/A

Tree species present

Quercus alba

Willow Oak

Estimated dbh range: Lg: 24" Sm: 4"

Populus tremuloides

Acer saccharum

Estimated Canopy Closure: ___Closed ___Moderate ✓Open

Roost Tree Potential consists of: ___Large Trees ___Snags ✓Both

Roost Tree Potential for the Area is: ___High ✓Moderate ___Low

Subcanopy Clutter: ___Closed ___Moderate ✓Open

Subcanopy Comprised Largely of: ✓Lower Branches of Canopy Trees ___Saplings ___Shrubs

Habitat Description: Edge of a woodlot and an old field near a large wetland

Check all that apply:

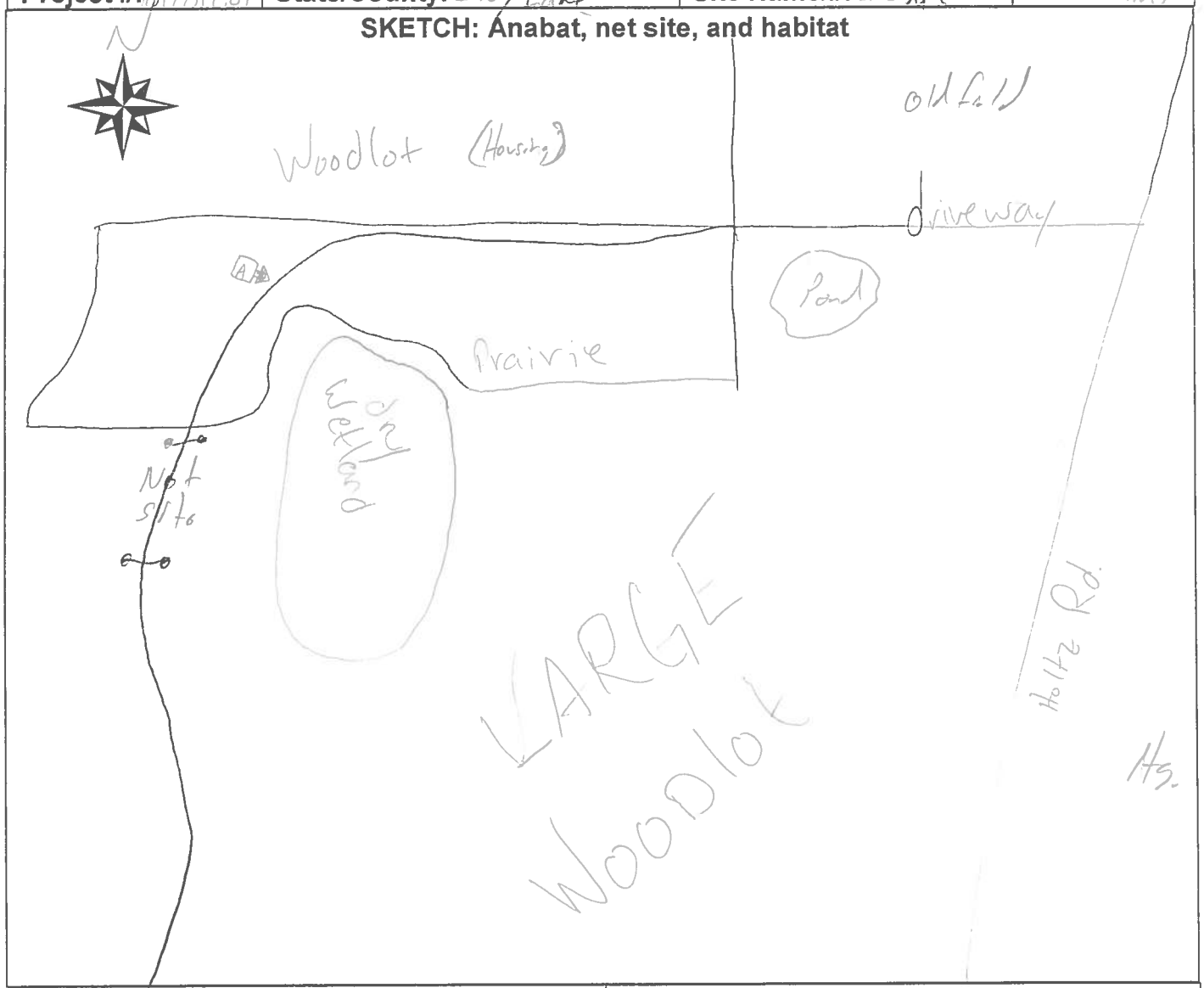
__Mature Upland Forest
__Young Upland Forest
✓Mature Lowland Forest
__Young Lowland Forest
__Recently Logged Forest
__Pine Plantation
✓Woodlot/ForestEdge
✓Old Field
__Crop/Pasture Land
__Stream/River
✓Emergent Wetland
__Forested Swamp
__Shrub/scrub Swamp
__Vernal Pool
__Deepwater Lake/Pond
__Other _____

Herbaceous Cover: ___ Sparce ___Moderate ✓Dense

ANABAT DATA (continued)

Project #: 1017017.01	State/County: IN / Lake	Site Name/#: IEA#2	Initials: TMS

SKETCH: Anabat, net site, and habitat



LEGEND	Weather Notes
Nets: ●——●	
Anabat: A ➡	

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BAT CAPTURE DATA

Project Name: Illiana Expressway	Date: 8/1/12	Biologists: JCB MKC	Page 1 of 2
Project #: 1012012.01 Site Name/#: IHV3	State: IN	County: Lake GPS Unit: Bat 2	Camera: Bat 2

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	N 43° 25.320'	W 83° 36.641	9m	20'	2000	0106	1172-1176
B	NN	N 41° 19.138	W 87° 22.992	9m	20'	2000	0116	1177-1181

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

NO BATS

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA (continued)

Project # 1012012.01	Site Name/#: JEN3	Date: 8/1/12	Biologists: MKC, KB	Page 2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)
2006	28.8	1-3	E-W	0	38
2206	23.3	1-3	E-W	0	47
2206	21.4	—	—	0	50
2306	21.5	—	—	0	50
6	2	1-3	E-W	0	50
0106	19.4		E-W	0	55

Moon Phase: Full Moon	Rise	Set
Moon	19:37	05:17
Sun	05:45	20:06

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA

Project Name: Illiana Expressway		Date: 8/2/12	Biologists: MKC, JCB		Page 1 of 2
Project #: 0	Site Name/#: IEN3	State: IN	County: Lake	GPS Unit: Bat2	Camera: Bat 2

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	N 41° 25.320'	W 83° 36.641'	9m	20'	1950	0105	1172-1176
B	NN	N 41° 19.138'	W 87° 22.992'	9m	20'	2000	0115	1177-1181

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
		no bats :(									

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA (continued)

Project #	Site Name/#:	Date:	Biologists:	Page
10120120 1	IEN3	8/2/12	JCB, MKC	2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)
2005	29.1	1-3	W-E	30	40
2105	24.4	—	—	50	50
2205	23.7	1-3	W-E	100	50
2305	22.5	1-3	W-E	100	51
0005	21.5	1-3	W-E	100	53
0105	21.4	1-3	W-E	50	52

Moon Phase: Full moon	Rise	Set
Moon	20:09	06:26
Sun	05:46	20:05

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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NET SITE HABITAT DESCRIPTION

Project #: 101202.01 **Date:** 8/2/12 **Biologists:** MKC, JCB

Project Name: Illiana Expressway **Site Name/#:** IEN3

State: IN **County:** Lake **USGS Quad:** —

Camera #: Bat2 **Picture #:** 1172-1181 **GPS Unit #:** Bat2 **Waypoint #:** IEN3

Coordinates: N 41° 25.320' W 83° 36.641

Distance to closest water source (meters): 5 Type of water source: pond

Water source name: —

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS):

Bank Height: ____meters Channel Width: ____meters Stream Width: ____meters

Substratum: ___Bedrock ___Boulder ___Cobble ___Gravel ___Sand ___Silt/Clay

Still Water Present (Y/N): ____ Average Water Depth: ____m or cm Clarity (H,M,L): ____

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh)	Subdominant Canopy Species (< 40 cm/16" dbh)
Carya ovata	Salix amygdaloides
Quercus alba	Rhododendron spp
Populus deltoides	Salix nigra
	Morus spp

Estimated dbh range: Lg: 80 Sm: 40 Estimated dbh range: Lg: 40 Sm: 2

Relative Abundance of Dominant vs. Subdominant (ratio): 1:5

Estimated Canopy Closure: ___Closed ___Moderate X Open

Roost Tree Potential consists of: ___Large Trees ___Snags X Both

Roost Tree Potential for the Area is: X High ___Moderate ___Low

Subcanopy Clutter: X Closed ___Moderate ___Open

Subcanopy Comprised Largely of: ___Lower Branches of Canopy Trees ___Saplings X Shrubs

Common Subcanopy Species: Lonicera maackii, Rosa multiflora, Carya ovata

Conversions
3 feet ≈ 1 meter
2 inches ≈ 5 cm

Habitat Description: Mature lowland forest with pond, many corridors leading to a farm, north

Check all that apply:

__Mature Upland Forest	__Recently Logged Forest	__Crop/Pasture Land	__Shrub/scrub Swamp
__Young Upland Forest	__Pine Plantation	__Stream/River	__Vernal Pool
X Mature Lowland Forest	__Woodlot/ForestEdge	X Emergent Wetland	X Deepwater Lake/Pond
__Young Lowland Forest	__Old Field	__Forested Swamp	__Other ____

Herbaceous Cover: ___ Sparce ___Moderate X Dense

N-679

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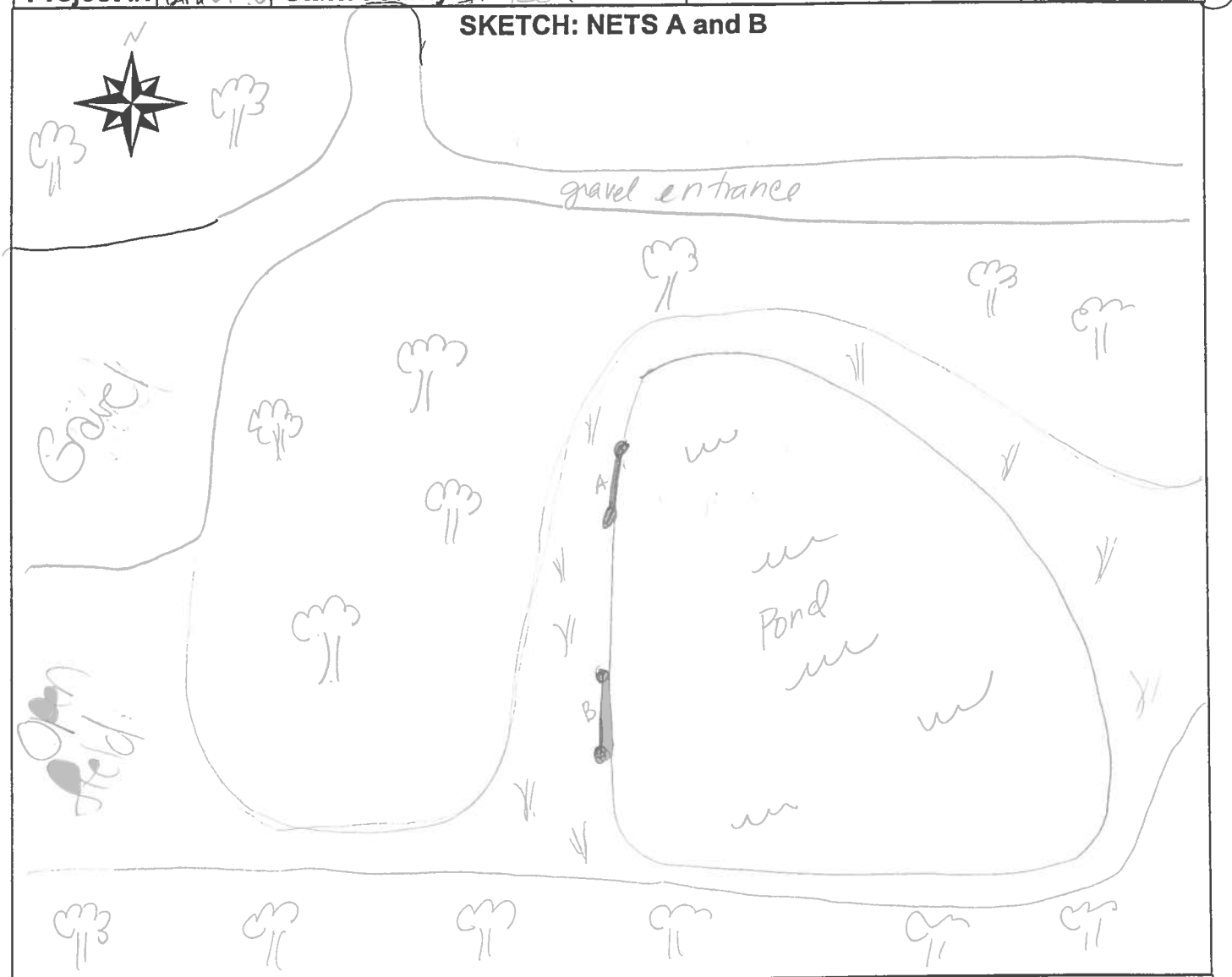
NET SITE HABITAT DESCRIPTION (continued)

Project #: 1012012.0	State/County: IN/Lake	Site Name/#: IEN3	Initials: JCB

SKETCH: NETS A and B



LEGEND	COMMENTS
Nets: ●——●	
tall grass	
wooded area	

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ANABAT DATA

Project Name: Iliana Expressway / N 41° 19.121' W 87° 23.023'			
Project #: 1012012.01		**Biologists:** CB MKC	
State: IN	**County:** Lake	**Site Name/#:** IEA3	
Camera #: Bat2	**Picture #:** 1182- 1186	**GPS Unit #:** BAT2	**Waypoint #:** IEA3

Anabat #/CF #	Date	Time on (0000 h)	Time off (0000 h)	Orientation	Sensitivity	Audio Division Ratio	Data Division Ratio	Waterproofing
80032/81	8/1	1940	0700	E	5	16	8	PVC
80032/81	8/2	1940	0115	E	5	16	8	PVC

Distance to closest water source (meters): 100

Type of water source: pond

Water source name: ——

Tree species present: Carya ovata, Quercus rubra

Estimated dbh range: Lg: 60 Sm: 2

Salix amygdaloides, Quercus alba

Estimated Canopy Closure: ✓ Closed ___ Moderate ___ Open

Roost Tree Potential consists of: ___ Large Trees ___ Snags ✓ Both

Roost Tree Potential for the Area is: ✓ High ___ Moderate ___ Low

Subcanopy Clutter: ___ Closed ✓ Moderate ___ Open

Subcanopy Comprised Largely of: ___ Lower Branches of Canopy Trees ✓ Saplings ✓ Shrubs

Habitat Description: Path through mature woods that leads to pond, intersection of paths, lowland

Check all that apply:

- ___ Mature Upland Forest
- ___ Young Upland Forest
- ✓ Mature Lowland Forest
- ___ Young Lowland Forest
- ___ Recently Logged Forest
- ___ Pine Plantation
- ___ Woodlot/ForestEdge
- ___ Old Field
- ___ Crop/Pasture Land
- ___ Stream/River
- ✓ Emergent Wetland
- ___ Forested Swamp
- ___ Shrub/scrub Swamp
- ___ Vernal Pool
- ✓ Deepwater Lake/Pond
- ___ Other _____

Herbaceous Cover: ___ Sparce ✓ Moderate ___ Dense

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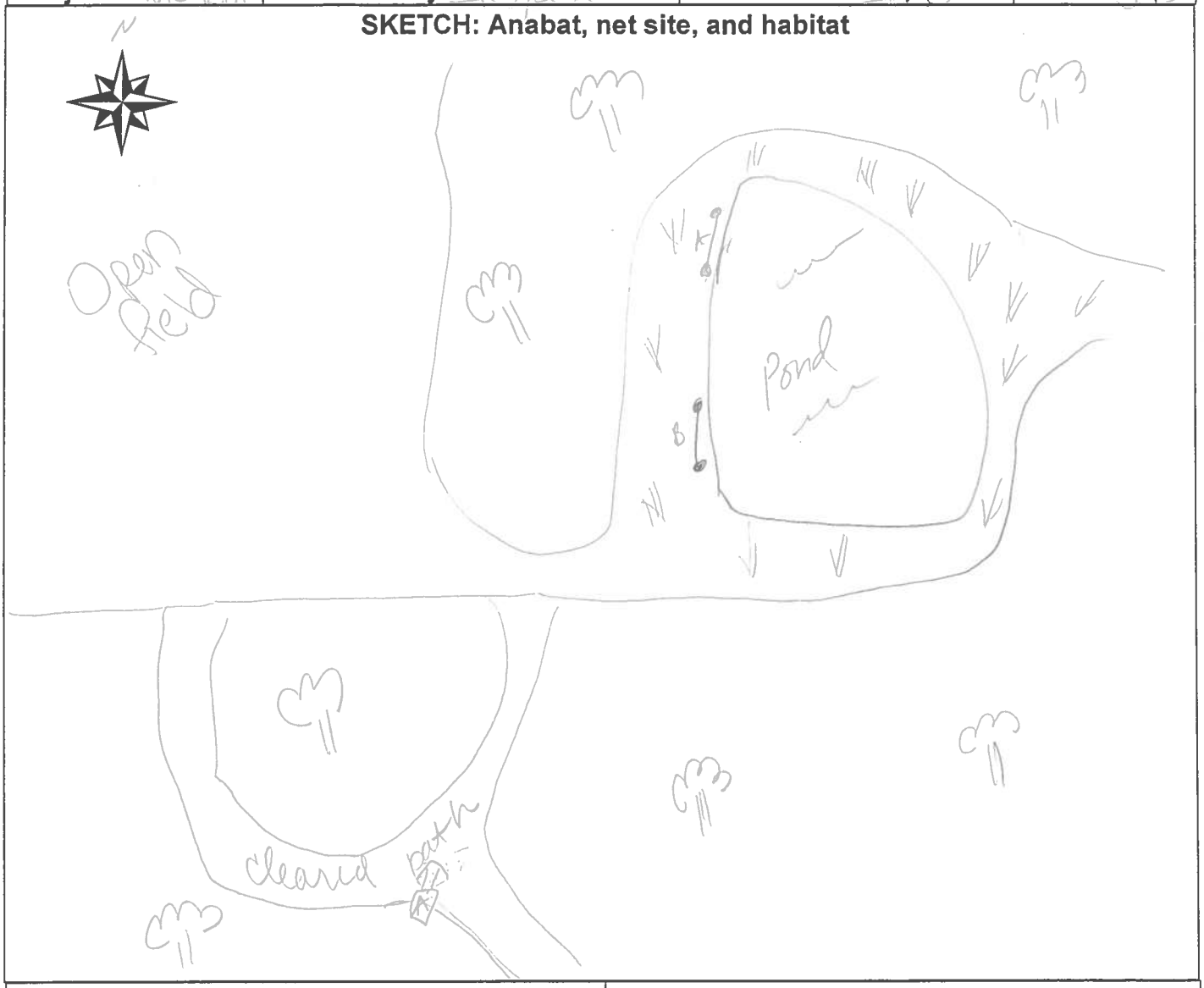
ANABAT DATA (continued)

Project #: 1012012.01	State/County: IN / Lake	Site Name/#: IFA3	Initials: YB

SKETCH: Anabat, net site, and habitat



LEGEND

Nets: ●——●

Anabat: A ➡

tall grass

wooded area

Weather Notes

_____

_____

_____

_____

_____

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BAT CAPTURE DATA

Project Name: Illiana Expressway	Date: 8-3-12	Biologists: JJS TMS	Page 1 of 2
Project #:	Site Name/#: IEN4	State: IN	County: Lake	GPS Unit: Bat 1	Camera: Bat 1

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	41°19'07.6"		6m	20ft	19:50	0103	4249-4253
B	NN	41°19'07.2"		9m	30ft	20:00	01 3	244-4248

Capt.#	Net #	Species (Latin name only)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
1	B	Lasiurus borealis	20:20	—	M	—	—	—	—	—	
2	B	"	1250	JV	M	↑	12.0	38	0	—	+ cp
3	B	"	2300	Ad	M	↓	22.0	49	0	—	
4	B	Myotis septentrionalis	2319	Ad	F	PL	7.25	37	0		
5	B	L. borealis	2340	—	—	—	—	—	—	—	not escape
6	A	L. borealis	"		M	↑	10	+	0	—	

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA (continued)

Project # 1012012.01	Site Name/#: IEN4	Date: 8-3-12	Biologists: JJS TMS	Page 2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)
2000	31.8	0	—	0	65
2100	25.8	0	—	0	87
2200	24.6	0	—	0%	95%
2300	24.6	0	—	0	95
0000	23.9	0	—	0	95%
0100	23.2	0	—	0	95

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Moon Phase: Waning Gibbous	Rise	Set
Moon	20:39	07:33
Sun	05:47	20:04

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA

Project Name: Illiana Expressway	Date: 8-21-12	Biologists: JJS TMS	Page 1 of 2
Project #: 1 / Site Name/#: IE NL1	State: IN	County: Lake / GPS Unit: Bat 1	Camera: Bat 1

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	41° 19' 02.1"	87° 24' 06.5"	6m	20ft	19:40	C1	4249-4253
B	NN	41° 19' 02.2"	2	9m	30ft	19:50	C108	4244-4248

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
1	B	E	2130	Ad	M	↓	16.75	45	0	—	
2	A	Lasiurus cinereus									
3	B		2320								net escape
4	B			Ad		↓			0	—	

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA (continued)

Project # 10MA12.01	Site Name/#: IEN4	Date: 8/4/12	Biologists: JJS TMS	Page 2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)
2000	22.6	0	—	0	95%
2100	22.4	0	—	0	95%
2200	22.4	0	—	0	95
2300	21.1	0	—	0	95%
0000	21.7	0	—	100	95%
0100	21.2	0	—	100	95%

Moon Phase: Waining Gibbous	Rise	Set
Moon	21:08	08:38
Sun	05:49	20:02

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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NET SITE HABITAT DESCRIPTION

Project #: 1012012.01 **Date:** 8-4-12 **Biologists:** JOS TMS

Project Name: Illiana Expressway **Site Name/#:** IEN4

State: IN **County:** Lake **USGS Quad:** —

Camera #: Bat1 **Picture #:** 4244-4253 **GPS Unit #:** Bat1 **Waypoint #:** IEN4B

Coordinates: 41° 19' 02.6" 87° 24' 01.5"

Distance to closest water source (meters): 0 Type of water source: Stream

Water source name: Cedar Creek

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS):

Bank Height: 1 meters Channel Width: 6 meters Stream Width: 6 meters

Substratum: ___Bedrock ___Boulder ___Cobble ___Gravel ___Sand ✓Silt/Clay

Still Water Present (Y/N): Y Average Water Depth: .5 m or cm Clarity (H,M,L): L

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh)	Subdominant Canopy Species (< 40 cm/16" dbh)
Quercus imbricaria	Prunus serotina
Prunus serotina	Maclura pomifera
Quercus macrocarpa	Lonicera maackii
Estimated dbh range: Lg: 36 Sm: 16	Estimated dbh range: Lg: 16 Sm: 4

Relative Abundance of Dominant vs. Subdominant (ratio): 1:100

Estimated Canopy Closure:	___Closed	✓Moderate	___Open
Roost Tree Potential consists of:	___Large Trees	___Snags	✓Both
Roost Tree Potential for the Area is:	___High	___Moderate	✓Low
Subcanopy Clutter:	___Closed	✓Moderate	___Open
Subcanopy Comprised Largely of:	✓Lower Branches of Canopy Trees	✓Saplings	✓Shrubs

Common Subcanopy Species: Rosa multiflora, Maclura pomifera, Oleagnus umbellata

Conversions
3 feet ≈ 1 meter
2 inches ≈ 5 cm

Habitat Description: Woodlot with several intersecting mowed paths. Net A across junction of two paths, Net B across small creek. Pool in creek

Check all that apply:

__Mature Upland Forest	__Recently Logged Forest	__Crop/Pasture Land	__Shrub/scrub Swamp
__Young Upland Forest	__Pine Plantation	✓Stream/River	__Vernal Pool
__Mature Lowland Forest	__Woodlot/ForestEdge	__Emergent Wetland	__Deepwater Lake/Pond
✓Young Lowland Forest	__Old Field	__Forested Swamp	__Other _____

Herbaceous Cover: ___ Sparce ✓Moderate ___Dense

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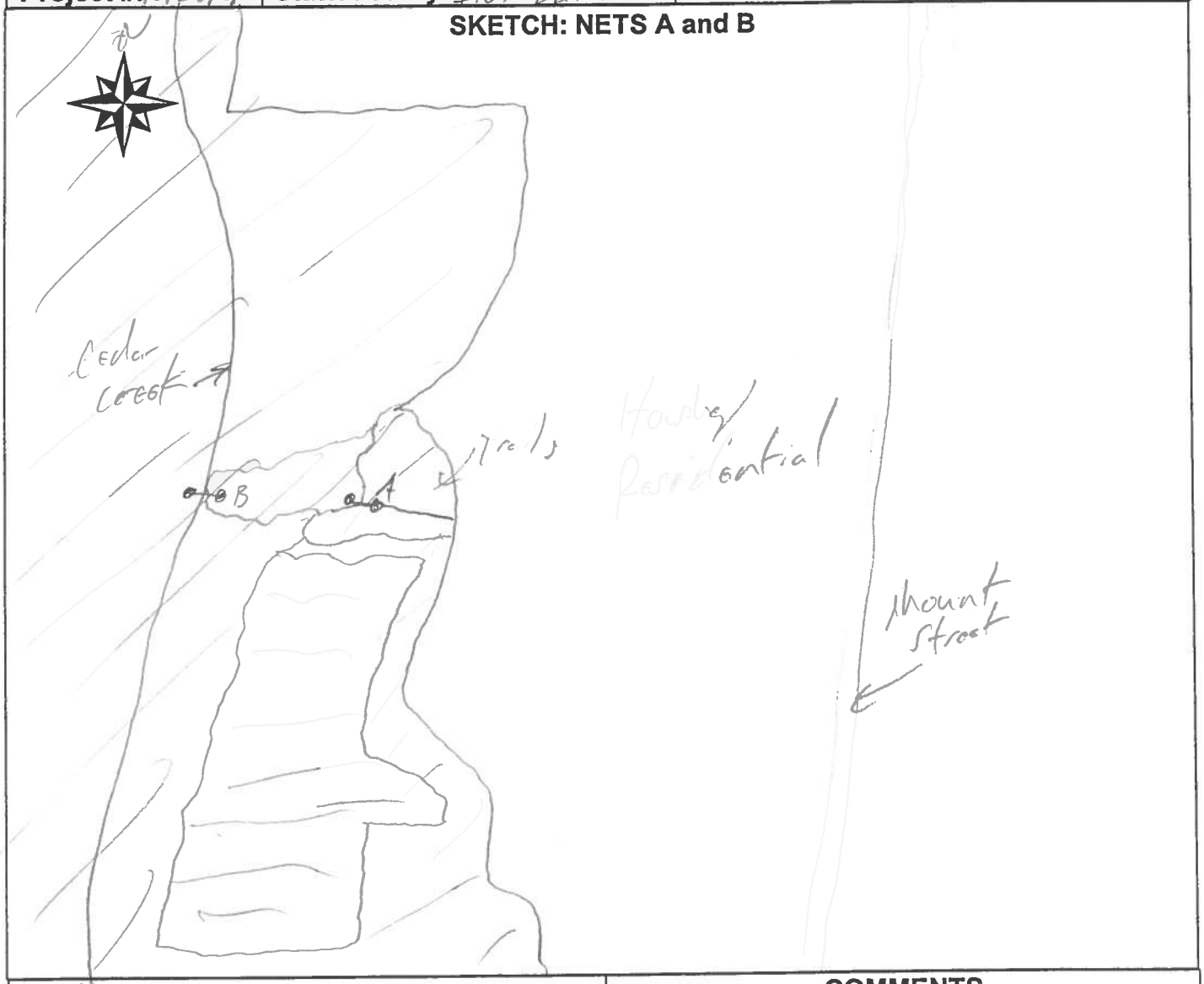
NET SITE HABITAT DESCRIPTION (continued)

Project #: 1012012.01	State/County: IN / Lake	Site Name/#: IEN4	Initials: JJS

SKETCH: NETS A and B



LEGEND

Nets: ●——●

old field

Forest

A → Arabat

COMMENTS

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BAT CAPTURE DATA

Project Name: Iliana Expressway	Date: 8/3/12	Biologists: MKC JCB	Page 1 of 2
Project #: 1012 / Site Name/#: IEN	State:	County: Lake / GPS Unit: Bat 2	Camera: Bat 2

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	N 41° 19.120'	W 87° 23.022'	6m	20'	1955	0105	1187-1191
B	NN	N 41° 19.113'	W 87° 29.137'	6m	20'	1958	0115	1192-1196

Capt.#	Net #	Species (Latin name only)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
1	B	L. borealis	2020	Jv	F	NR	10.5	38	0P	—	1201-1202
2	B	L. borealis	2030	Jv	F	NR	11.0	40	0	—	—
3	B	L. borealis	2120	Jv	F	NR	11.0	40	0	—	—
4	A	E. fuscus	2128	—	—	—	—	—	0	—	escaped from net
5	A	L. borealis	1[illegible]	Jv	F	NR	11.75	41	0	—	—
6	A	E. fuscus	0012	Ad	M	↑	18.75	50	1	—	—
7	B	L. borealis	0105	Jv	M	↑	10.75	38	1	—	—

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA (continued)

Project #	Site Name/#:	Date:	Biologists:	Page of
10120120 1	IEN5	8/3/12	MKC, JCB	2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)
2005	28.5	1-3	N-S	0	42
2105	26.0	1-3	N-S	0	50
2205	25.3	—	—	0	50
2305	24.6	—	—	0	52
	23.9	—	—	0	53
0105	23.9	—	—	0	52

Moon Phase: Full Moon	Rise	Set
Moon	20:40	07:35
Sun	05:47	20:05

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA

Project Name: Illiana Expressway	Date: 8/4/12	Biologists: MKC JCB	Page 1 of 2
Project #: 10120/2.01 Site Name/#: IEN5	State: IN	County: Lake GPS Unit: Bat 2	Camera: Bat 2

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	N 41°19.120'	W 87°23.022'	6m	20'	1950	0103	1187-1191
B	NN	N 41°19.113'	W 87°29.137'	6m	20'	1953	0113	1192-1196

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
1	A	E. fuscus	0	Jv	F	NR	19.5	49	1	—	—
2	A	E. fuscus	21:20	Ad	M	↓	17.0	46	1	—	—
3	B	L. borealis	21:20	—	—	—	—	—	—	—	scrape from net

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA (continued)

Project #	Site Name/#:	Date:	Biologists:	Page
1012012.01	IEN5	8/4/12	MKC JCB	2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)
2003	25.3	0	—	5%	46%
2103	22.0	0	—	5%	56%
2203	22.5	0	—	0%	60%
2303	22.0	0	—	20	0
0003	21.4	0	—	30	0
0103	21.5	0	—	30	60

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Moon Phase:	Rise	Set
Moon	21:08	08:40
Sun	05:48	20:03

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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ANABAT DATA

Project Name: Illiana Expressway		41° 19' 02.1" 87° 23' 59.0"	
Project #: 1012012.01		**Biologists:** JJS TMS	
State: IN	**County:** Lake	**Site Name/#:** IEA4	
Camera #: Bat1	**Picture #:** 4237 - 4241	**GPS Unit #:** Bat1	**Waypoint #:** IEA4

Anabat #/CF #	Date	Time on (0000 h)	Time off (0000 h)	Orientation	Sensitivity	Audio Division Ratio	Data Division Ratio	Waterproofing
81216/44	8-3-12	1930	0600	East	5	16	8	PVC
81216/44	8-4-12	1930	0122	East	5	16	8	PVC

Distance to closest water source (meters): 265

Type of water source: Stream

Water source name: Cedar Creek

Tree species present

Estimated dbh range: Lg: 38" Sm: 5

Quercus imbricaria — Prunus serotina

Quercus macrocarpa — Carya ovata

Estimated Canopy Closure:	___Closed	___Moderate	✓Open
Roost Tree Potential consists of:	___Large Trees	___Snags	✓Both
Roost Tree Potential for the Area is:	___High	✓Moderate	___Low
Subcanopy Clutter:	___Closed	✓Moderate	___Open
Subcanopy Comprised Largely of:	✓Lower Branches of Canopy Trees	___Saplings	___Shrubs

Habitat Description: Edge of young woodlot and residential / livestock yard.

Check all that apply:

__Mature Upland Forest	__Recently Logged Forest	✓Crop/Pasture Land	__Shrub/scrub Swamp
✓Young Upland Forest	__Pine Plantation	__Stream/River	__Vernal Pool
__Mature Lowland Forest	✓Woodlot/ForestEdge	__Emergent Wetland	__Deepwater Lake/Pond
__Young Lowland Forest	__Old Field	__Forested Swamp	__Other _____

Herbaceous Cover: ___ Sparce ___Moderate ✓Dense

Pic 4241 snag near anabat

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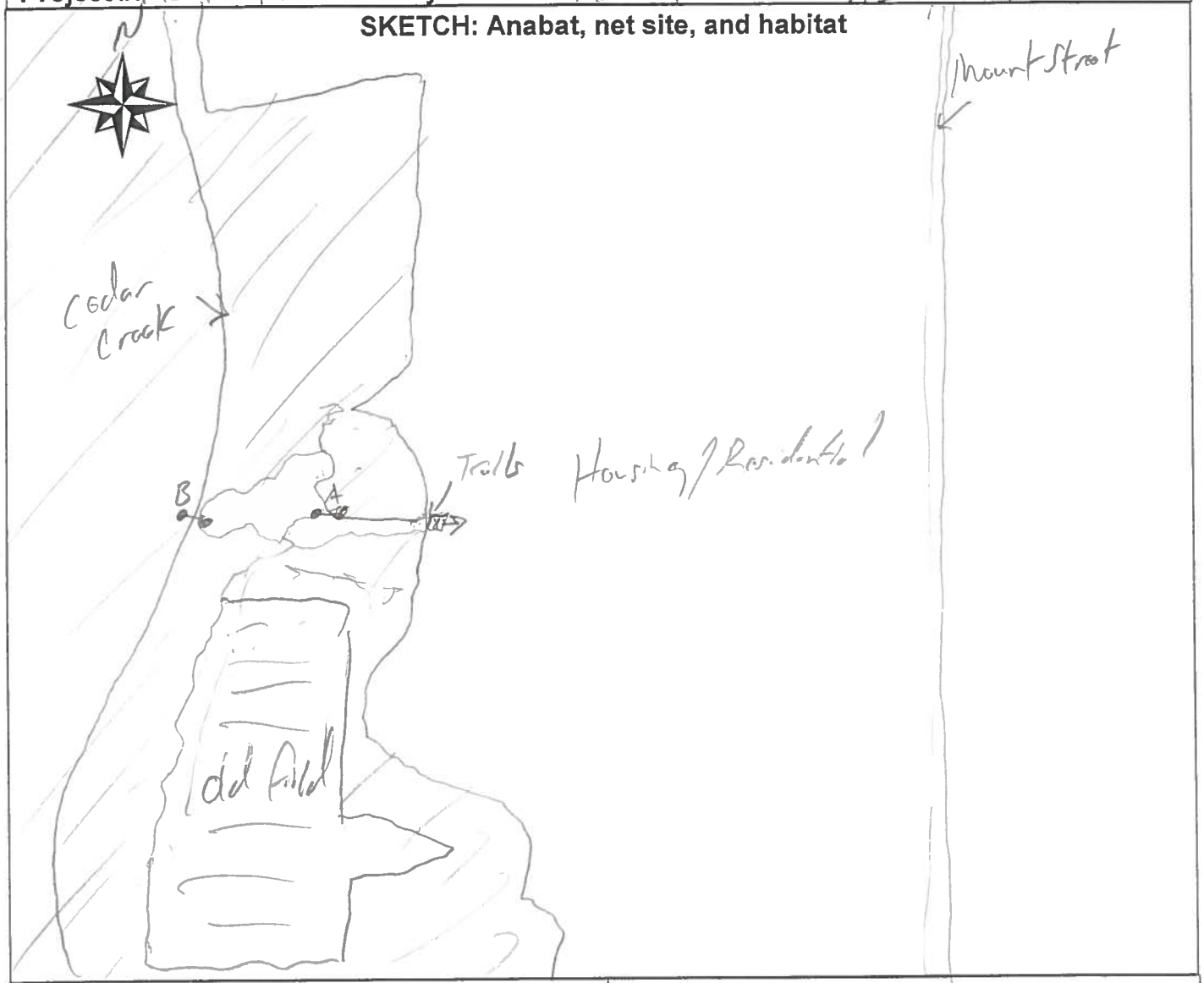
ANABAT DATA (continued)

Project #: 10/2012.01	State/County: IN / Lake	Site Name/#: IEN4	Initials: DJS

SKETCH: Anabat, net site, and habitat



LEGEND

Nets: ●——●

Anabat: A ➡

☒ Forest

☐ old field

Weather Notes

_____

_____

_____

_____

_____

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NET SITE HABITAT DESCRIPTION

Project #: 101012.01 **Date:** 8/3/12 **Biologists:** MKC, JCB

Project Name: Illiana Expressway **Site Name/#:** IEN5

State: IN **County:** Lake **USGS Quad:** —

Camera #: Bat2 **Picture #:** 187-196 **GPS Unit #:** Bat2 **Waypoint #:** IEN5A

Coordinates: N41°19.120' W87°23.022'

Distance to closest water source (meters): 500 Type of water source: pond

Water source name: —

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS):

Bank Height: _____meters Channel Width: _____meters Stream Width: _____meters

Substratum: ___Bedrock ___Boulder ___Cobble ___Gravel ___Sand ___Silt/Clay

Still Water Present (Y/N): _____ Average Water Depth: ____m or cm Clarity (H,M,L):____

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh)
Quercus alba, Quercus rubra
Quercus macrocarpa
Pinus strobus

Subdominant Canopy Species (< 40 cm/16" dbh)
Picea pungens
Picea abies
Fraxinus americana

Estimated dbh range: Lg: 80 Sm: 40

Estimated dbh range: Lg: 40 Sm: 2

Relative Abundance of Dominant vs. Subdominant (ratio):_____

Estimated Canopy Closure:	___Closed	X Moderate	___Open
Roost Tree Potential consists of:	X Large Trees	___Snags	___Both
Roost Tree Potential for the Area is:	___High	X Moderate	___Low
Subcanopy Clutter:	X Closed	___Moderate	___Open
Subcanopy Comprised Largely of:	___Lower Branches of Canopy Trees	X Saplings	X Shrubs

Common Subcanopy Species: Prunus serotina, Lonicera maacki

Conversions
3 feet ≈ 1 meter
2 inches ≈ 5 cm

Habitat Description: fragmented mature bottomland forest with corridor, dominated near bay

Check all that apply:

__Mature Upland Forest	__Recently Logged Forest	__Crop/Pasture Land	__Shrub/scrub Swamp
__Young Upland Forest	__Pine Plantation	__Stream/River	__Vernal Pool
X Mature Lowland Forest	X Woodlot/ForestEdge	__Emergent Wetland	__Deepwater Lake/Pond
__Young Lowland Forest	__Old Field	__Forested Swamp	__Other _____

Herbaceous Cover: ___ Sparce ✓ Moderate ___Dense

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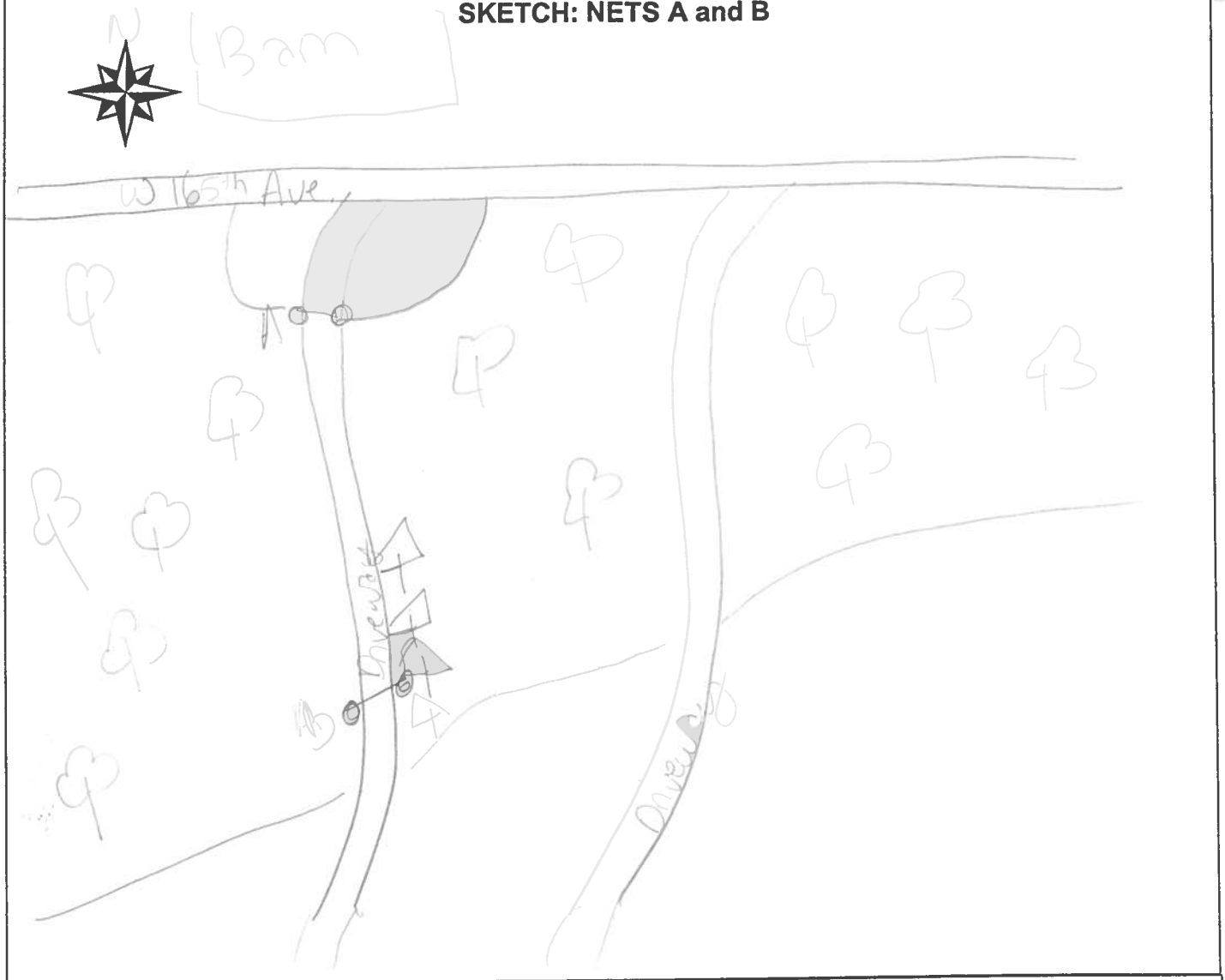
NET SITE HABITAT DESCRIPTION (continued)

Project #:	State/County: IN / Lake	Site Name/#: IN 5	Initials:

SKETCH: NETS A and B



LEGEND

Nets: ●——●

Forest B or A

COMMENTS

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ANABAT DATA

Project Name: Illiana Expressway N41°19.095' W87°29.165'			
Project #: 101202.01		**Biologists:** MKC, JCB	
State: IN	**County:** Lake	**Site Name/#:** IEA5	
Camera #: Bat 2	**Picture #:** 1907 - 1200	**GPS Unit #:** Bat 2	**Waypoint #:** IEA5

Anabat #/CF #	Date	Time on (0000 h)	Time off (0000 h)	Orientation	Sensitivity	Audio Division Ratio	Data Division Ratio	Waterproofing
80032/8	8/13	1930	0600	SE	5	16	8	PVC
80032/8	8-14	1930	0109	SE	5	16	8	PVC

Distance to closest water source (meters): 500

Type of water source: pond

Water source name: —

Tree species present: Populus tremuloides, Quercus alba, Quercus macrocarpa, Quercus rubra

Estimated dbh range: Lg: 80 Sm: 2

Estimated Canopy Closure: ___Closed ✓Moderate ___Open

Roost Tree Potential consists of: ✓Large Trees ___Snags ___Both

Roost Tree Potential for the Area is: ___High ✓Moderate ___Low

Subcanopy Clutter: ✓Closed ___Moderate ___Open

Subcanopy Comprised Largely of: ___Lower Branches of Canopy Trees ✓Saplings ✓Shrubs

Habitat Description: fragmented mature bowland forest, next to open clearing as backyard and line of aspen planted

Check all that apply:

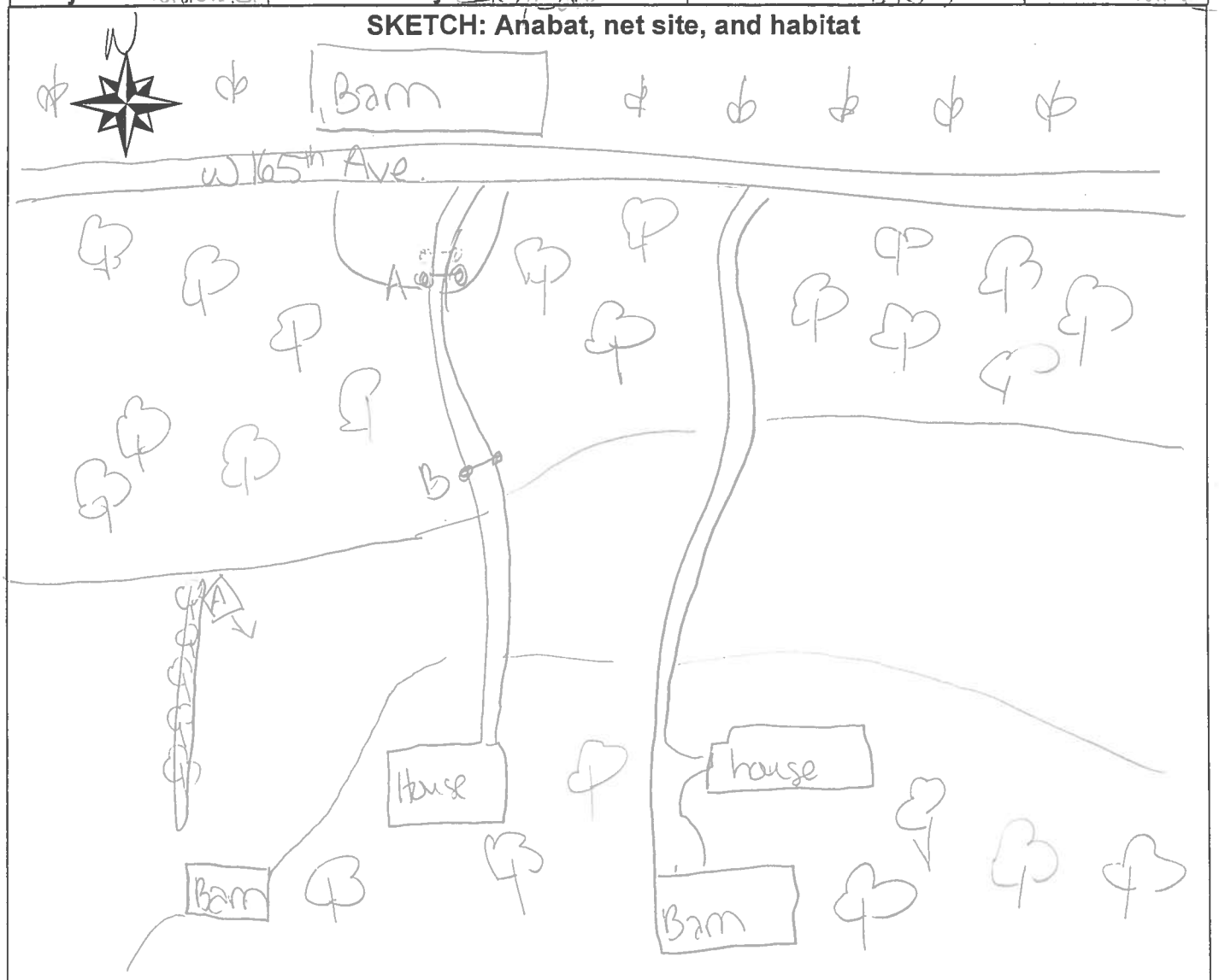
__Mature Upland Forest
__Young Upland Forest
✓Mature Lowland Forest
__Young Lowland Forest
__Recently Logged Forest
__Pine Plantation
✓Woodlot/ForestEdge
__Old Field
__Crop/Pasture Land
__Stream/River
__Emergent Wetland
__Forested Swamp
__Shrub/scrub Swamp
__Vernal Pool
__Deepwater Lake/Pond
__Other _____

Herbaceous Cover: ___ Sparce ___Moderate ✓Dense

ANABAT DATA (continued)

Project #: 10120120.01	State/County: IL / Ste	Site Name/#: TN 5	Initials: MKC

SKETCH: Anabat, net site, and habitat



LEGEND

Nets: ●——●

Anabat: A ➡

Forest:

Ag field:

Weather Notes

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BAT CAPTURE DATA

Project Name: Iliana Expressway		Date: 5/31/13	Biologists: MKC, JS		Page 1 of 2
Project #: 012012.01	Site Name/#: IEN176	State: IN	County: Lake	GPS Unit: bat 1	Camera: bat 1

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	16 0474603	4576218	6m	20ft	2010	0115	5040-43
B	NN	0474535	4576157	9	20ft	2015	0115	5036-39

Capt.#	Net #	Species (Latin name only)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
1	B	Lasiurus borealis	22:20	Ad	F	PG	16.5	41	0	—	

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

Flying Squirrel @21:50.

N-699

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BAT CAPTURE DATA (continued)

Project #	Site Name/#:	Date:	Biologists:	Page
1012012.01	IN106	5/31/13	MKC, JJS	2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)	# Bats
2015	76.1	1-3	S to N	10	75	0
2115	66.9	1-3	S to N	60	99	0
2215	68.0	1-3	S to N	100	95	1
2315	20.0	1-3	S to N	100	95	0
0015	20.5	4-7	S to N	100	95	0
0030	20.5	13-18	S to N	100	95	0

°F

Moon Phase:	%	Rise	Set
waning gibbous	60		
Moon		0151	1338
Sun		0618	2114

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

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BAT CAPTURE DATA

Project Name: Illinois	Date: 6-1-13	Biologists: JD TMS	Page 1 of 2
Project #: 1012.012.01 Site Name/#: IEN06	State: IN	County: Lake	GPS Unit: Red 1 / Camera: Set 1

Net/Trap	Net/Trap Type[1]	Coordinates		Length	Height	Time Up (0000 h)	Time Down (0000 h)	Picture #
A	NN	16 0474603	4576218	6m	20ft	2010		5040-43
B	NN	0474535	4576157	9	20ft	2015		5036-39

Capt.#	Net #	Species (Latin name only)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #
1	A	Eptesicus fuscus	23:50	—	—	—	—	—	—	—	Not escape

[1] M = Monofilament, ON = Old Nylon, NN = New Nylon, HT = Harp Trap; A = Anabat
[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

Flying Squirrel @ 21:48
Flying Squirrel @ 22:30

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BAT CAPTURE DATA (continued)

Project # 1012012.01	Site Name/#: IEN06	Date: 6-1-13	Biologists: JJS TMS	Page 2 of 2

Capt.#	Net #	Species (*Latin name only*)	Time	Age (Ad/Jv)	Sex (M/F)	Repro.[2]	Wt (g)	RFA (mm)	Scarring Index[3]	Band #	Comments/Picture #

Time (0000 h)	Temp (°C)	Wind Speed	Wind Direction: From ___ to ___	% Cloud Cover (estimated)	RH (%)	# Bats
2015	19	4-7	W to E	100	95	0
2115	17.5	4-7	W to E	100	95	0
2215	17	1-3	W to E	100	90	0
2315	17	4-7	W to E	100	90	0
0015	16.6	4-7	W to E	0	90	1
0115	16.5	1-3	W to E	0	95	0

Moon Phase: 3rd Quarter	% 50	Rise	Set
Moon		1:18	13:41
Sun		17:18	20:16

Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved
19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong Breeze	Large branches in motion; telephone wires whistle
32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress

Comments:

[2] Reproductive Condition: Female = NR/PG/L/PL; Male = ↑/↓
[3] 0= no damage, 1=light, 2=medium, 3=heavy, P= puncture (pictures required)

NET SITE HABITAT DESCRIPTION

Project #: 1012012.01 **Date:** 5/31/13 **Biologists:** MKC, JJS

Project Name: Illiana Expressway **Site Name/#:** IEN06

State: IN **County:** Lake **USGS Quad:** ____

Camera #: bat1 **Picture #:** ____ **GPS Unit #:** bat1 **Waypoint #:** ____

Coordinates: ____

Distance to closest water source (meters): 170m Type of water source: pond

Water source name: n/a

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS):

Bank Height: ____meters Channel Width: ____meters Stream Width: ____meters

Substratum: ___Bedrock ___Boulder ___Cobble ___Gravel ___Sand ___Silt/Clay

Still Water Present (Y/N): ____ Average Water Depth: ____m or cm Clarity (H,M,L):____

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh)
Hickory
Oak

Estimated dbh range: Lg: ____ Sm: ____

Subdominant Canopy Species (< 40 cm/16" dbh)
hickory
oak
pawpaw

Estimated dbh range: Lg: ____ Sm: ____

Relative Abundance of Dominant vs. Subdominant (ratio):____

Estimated Canopy Closure:	X Closed	___Moderate	___Open
Roost Tree Potential consists of:	___Large Trees	___Snags	X Both
Roost Tree Potential for the Area is:	___High	X Moderate	___Low
Subcanopy Clutter:	X Closed	___Moderate	___Open
Subcanopy Comprised Largely of:	X Lower Branches of Canopy Trees	X Saplings	___Shrubs

Common Subcanopy Species: pawpaw, raspberry

Conversions
3 feet ≈ 1 meter
2 inches ≈ 5 cm

Habitat Description: Corridor through upland forest near ag field

Check all that apply:

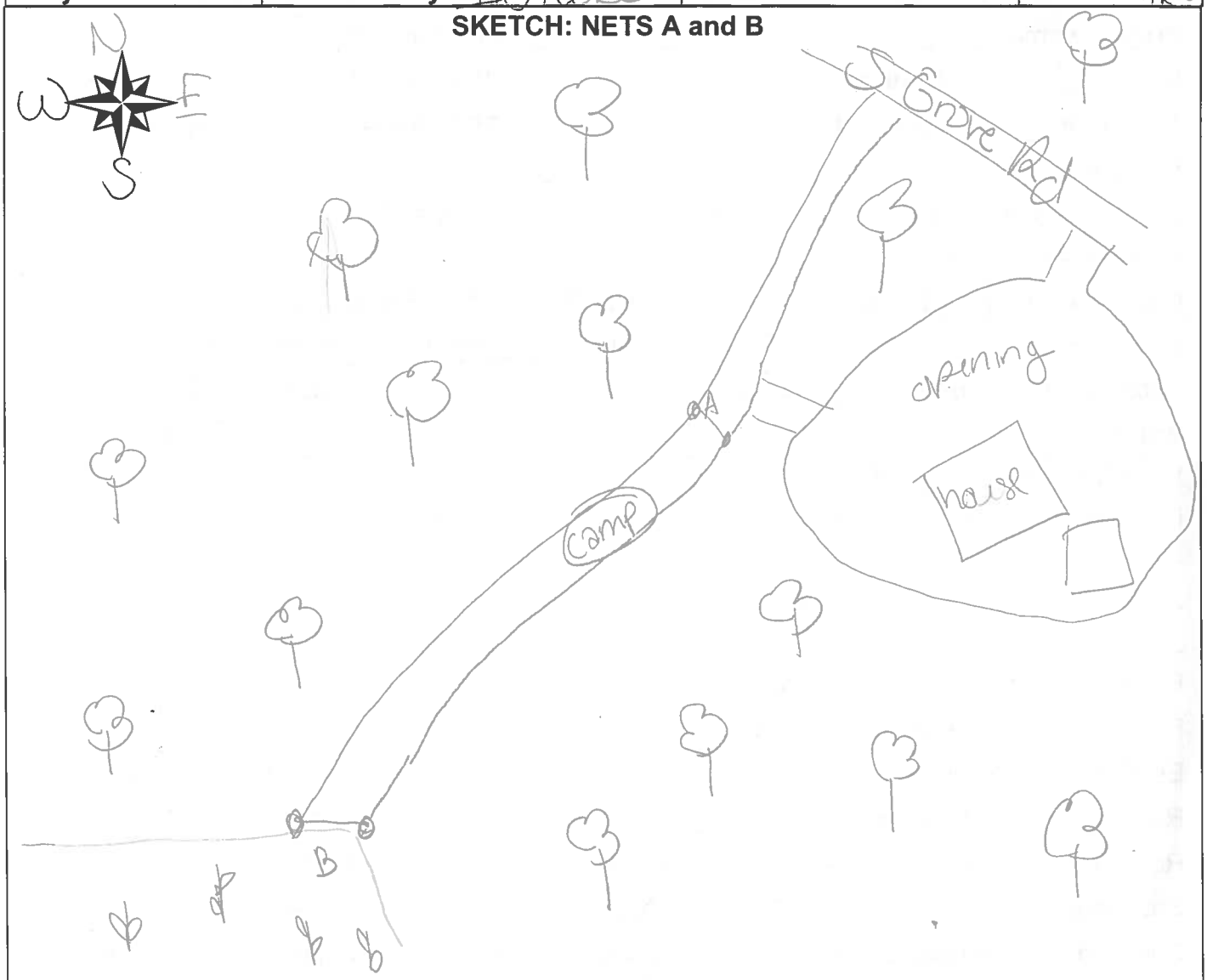
X Mature Upland Forest	__Recently Logged Forest	__Crop/Pasture Land	__Shrub/scrub Swamp
__Young Upland Forest	__Pine Plantation	__Stream/River	__Vernal Pool
__Mature Lowland Forest	__Woodlot/ForestEdge	__Emergent Wetland	__Deepwater Lake/Pond
__Young Lowland Forest	__Old Field	__Forested Swamp	__Other ____

Herbaceous Cover: ___ Sparce X Moderate ___Dense

NET SITE HABITAT DESCRIPTION (continued)

Project #:	State/County: Ind/Lake	Site Name/#:	Initials: MKC JB

SKETCH: NETS A and B



LEGEND	COMMENTS
Nets: ●——●	Net A: 6m, 20ft
Forest:	Net B 9m, 20ft
Ag:	

ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE

Indiana Bat Survey
Illiana Corridor, I-55 to I-65
Job No.: P-92-749-20 (Seq. No.: 16651A)
Will, Kankakee, Grundy, and Kendall Counties

Joseph F. Merritt and Jean M. Mengelkoch

22 February 2013

INHS/IDOT

Statewide Biological Survey & Assessment

Program Report 2013(3)

University of Illinois at Urbana-Champaign

Prairie Research Institute

William Shilts, Executive Director

ILLINOIS NATURAL HISTORY SURVEY

Brian D. Anderson, Director

1816 South Oak Street

Champaign, IL 61820

217-333-6830

On 20 March 2012 the Bureau of Design & Environment submitted a request of the Illinois Natural History Survey (INHS) to conduct a survey for bats including the federally endangered Indiana bat (*Myotis sodalis*) in the vicinity of the Illiana Corridor, I-55 to I-65 (Seq. No.:16651A). The project consists of the construction of the Illiana between I-55 and I-65.

Records and Previous Surveys

The Illinois Natural Heritage Database has no records of Indiana bats from Will, Kankakee, Grundy, or Kendall Counties. Neither Hoffmeister (1989) nor Hofmann (2008) reported the occurrence of Indiana bats from these counties. In addition, for many years, bats tested for rabies by the Illinois Department of Public Health have been sent to the INHS for identification. According to this database, the Indiana bat has not been reported from Will, Kankakee, Grundy or Kendall Counties (INHS Rabies Specimen Database, maintained by J.E. Hofmann).

Natural History of Indiana bats

Indiana bats congregate in caves or abandoned mines for hibernation, but are more widely dispersed during the summer (Barbour and Davis 1969). Maternity colonies primarily roost beneath slabs of exfoliating bark on dead trees, but also have been found beneath the "shaggy" bark of certain live hickories (*Carya*) and oaks (*Quercus*), and in tree crevices (Cope et al. 1973; Humphrey et al. 1977; Gardner et al. 1991; Kurta et al. 1993a, b, 1996, 2002; Callahan et al. 1997; Carter 2003). Maternity colonies, however, recently have been found roosting in buildings (a church, house, and barn), artificial roosting structures (e.g., bat houses), and utility poles (Carter et al. 2001; Butchkoski and Hassinger 2002; Chenger 2003; Hendricks et al. 2005; Kurta 2005; Ritzi et al. 2005). Males and non-reproductive females use caves, mines, bridges,

and artificial roosting structures as well as trees for diurnal roosts during summer (Mumford and Cope 1958; Gardner et al. 1991; Salyers et al. 1996; Ford et al. 2002; INHD).

Many known maternity roost trees have been relatively large, with a dbh (diameter at breast height) of at least 12 in (30 cm) (e.g., Gardner et al. 1991; Kurta et al. 1993a, 1996; Callahan et al. 1997; Whitaker and Brack 2002). Female and juvenile Indiana bats have been documented roosting in more than 30 species of trees (Kurta 2005). Tree species known to have been used by Indiana bat maternity colonies in Illinois are northern red oak (*Q. rubra*), white oak (*Q. alba*), post oak (*Q. stellata*), pin oak (*Q. palustris*), slippery elm (*Ulmus rubra*), American elm (*U. americana*), shagbark hickory (*C. ovata*), bitternut hickory (*C. cordiformis*), silver maple (*Acer saccharinum*), cottonwood (*Populus deltoides*), sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), and sweetgum (*Liquidambar styraciflua*) (Gardner et al. 1991, Kurta et al. 1993a, Carter 2003). A maternity colony uses more than one tree during the summer (e.g., Gardner et al. 1991; Kurta et al. 1996; Callahan et al. 1997), but the number of roost trees a colony needs presumably is variable (Menzel et al. 2001). A colony in Michigan roosted in 23 trees (Kurta et al. 1996) and four Missouri colonies used 10-20 roost trees each (Callahan et al. 1997). In Michigan, members of a maternity colony occupied trees that were up to 5.1 mi (8.2 km) apart during a summer and traveled as much as 3.6 mi (5.8 km) between roost trees overnight (Kurta et al. 2002). Individual roost trees have a limited "lifespan," making them an ephemeral resource (Gardner et al. 1991).

Trees used by Indiana bats in Illinois have been located in upland and floodplain forests, a swamp, and pastures (Gardner et al. 1991; Kurta et al. 1993a; Carter 2003). There is a consensus that Indiana bat maternity colonies occupy primary roosts that are exposed to high levels of solar radiation (Menzel et al. 2001). The death of an overstory tree creates a light-gap

in the forest canopy that exposes remaining trees to solar radiation. Dead trees along forest edges or in areas impacted by flooding also have high levels of exposure to sunlight. Some alternate maternity roosts, as well as roosts used by male Indiana bats, are in shaded locations (Gardner et al. 1991, Callahan et al. 1997). Most Indiana bat roost trees have been close to (or surrounded by) water (e.g., Humphrey et al. 1977; Gardner et al. 1991; Callahan et al. 1997; Kurta et al. 1996, 2002; Carter 2003), but some have been found more than 1.2 mi (2 km) from a perennial stream (Gardner et al. 1991, Kurta et al. 1993a). Trees occupied by reproductively active female and juvenile Indiana bats in Illinois (n = 56) were rarely within 1637 ft (500 m) of a paved highway (Gardner et al. 1991). In contrast, a maternity colony in Indiana recently was found roosting in trees near a major highway (J.M. Mengelkoch, personal observation). Some adult male Indiana bats roosted less than 786 ft (240 m) from a paved highway in Illinois (Gardner et al. 1991) and an adult male in West Virginia occupied a tree only 43 ft (13 m) from a road (Ford et al. 2002).

Most Indiana bat maternity colonies in the Midwest have been found in landscapes that were a mosaic of forest and agricultural areas (Cope et al. 1973; Humphrey et al. 1977; Gardner et al. 1991; Kurta et al. 1993a, b, 2002; Callahan et al. 1997; Carter 2003). Despite the fact that they roost in trees, the presence of Indiana bats does not seem to be correlated with forest cover. In Missouri, for example, the amount of forest cover did not differ significantly between sites where Indiana bats were captured and not captured (Miller et al. 2002). In Illinois, Carter et al. (2002) found significantly fewer and smaller patches of urban development in the vicinity of Indiana bat roosts than at random sites. There also was less residential land around Indiana bat capture sites than unsuccessful netting sites in Missouri (Miller et al. 2002). Belwood (2002), however, documented a maternity colony occupying trees in a wooded subdivision in Ohio and a

colony near the Indianapolis Airport occupies a rural area surrounded by urban/suburban development (Whitaker et al. 2004, Sparks et al. 2005a).

Although more needs to be learned about habitat requirements of Indiana bat maternity colonies at the landscape level (Menzel et al. 2001, U.S. Fish and Wildlife Service 2007), it seems reasonable that sustainable habitat would include a variety of snags, hickories, and numerous large, senescent trees that would provide future roost sites. Requirements for foraging habitat are less restrictive; habitats used by foraging Indiana bats include riparian corridors, wetlands, upland forests, ponds, and fields (Menzel et al. 2001).

The Indiana bat was listed as a federal endangered species in 1967. The population estimate for the species (based on censuses at hibernacula) declined 57% from 1965 to 2001 (U.S. Fish and Wildlife Service 2007). Since then the total number of Indiana bats appears to have increased (U.S. Fish and Wildlife Service 2007). Population changes, however, do not seem to be occurring uniformly throughout the species' range. Numbers have decreased or remained stable recently in parts of the species' range, but the number hibernating in Illinois has increased (U.S. Fish and Wildlife Service 2007).

Methods for Choosing Sites for Habitat Assessment and Mist Netting

We drove in and around the entire corridor on 9 May 2012. We used every available road to see as much of the corridor as possible. We looked for sites of potentially suitable Indiana bat habitat. We stopped at every point where a waterway crossed a road near the corridor and assessed whether or not the waterway should or could be mist netted. Due to safety concerns and the amount of field equipment needed to mist net, it was not feasible to mist net long distances from where we can drive a vehicle.

The vast majority of the waterways in the corridor were too narrow and the flyways too cluttered with trees and branches to mist net. The Kankakee River and its tributaries were too deep to mist net.

Potential Mist Netting Sites

Please refer to the series of large maps at the end of this report for potential mist netting sites we examined.

Site 1 was the Kankakee River. The river is too large and deep to mist net.

Site 2 was Forked Creek which joins the Kankakee River in Wilmington. This site was too deep and lacked a tree canopy over the creek.

Site 3 was Jordan Creek was too narrow and only had trees on one side of the creek. There was no tree canopy over the creek.

Site 4 was also on Jordan Creek. This site was also too narrow and lacked trees around the creek.

Site 5 was a channel that was too narrow and had steep banks. There were no trees near the channel.

Site 6 was on Forked Creek. This is the site that we mist netted. There were nice, mature trees in the area and a wide channel.

Site 7 was also on Forked Creek. There were no trees near the creek. It was completely open.

Site 8 was on the South Branch of Forked Creek. The site lacked trees, so there was no canopy over the creek.

Site 9 was also on the South Branch of Forked Creek. The site lacked trees, so there was no canopy over the creek.

Site 10 was ditch-like and lacked trees. There was no canopy over the ditch.

Site 11 was on Rock Creek. There were no trees near the creek, therefore there was no tree canopy over the creek.

Site 12 consisted of a very narrow waterway. The site lacked trees.

Site 13 was a narrow waterway with no trees in the vicinity.

Site 14 was a very narrow (several feet wide) waterway with some scattered trees alongside the waterway. The site was too narrow and open to mist net.

Site 15 was a very narrow (several feet wide) waterway with some scattered trees alongside the waterway. The site was too narrow and open to mist net.

Site 16 was a narrow waterway with no trees in the area.

Site 17 was a narrow waterway with no trees in the area.

Site 18 was too narrow to mist net.

Mist Netting Site Selection Conclusions

We were able to locate one site that was suitable; this was Site 6. The site was located outside of the defined corridor, but it was near the corridor, accessible, and the creek crossed the corridor to the north.

There was a section of woods that the creek ran through within the corridor about a half-mile northeast of the site we mist netted. However, the creek was almost ½ mile through 2 separate agricultural fields and another wooded area from the closest farm on South Cedar Road. One-half mile is too far to carry all the equipment needed for mist netting and the terrain would be treacherous to traverse in the middle of the night without a road or path to follow.

The site we chose is within the known distance that an Indiana bat may travel between roosts and while foraging. Kurta et al. (2002) found that Indiana bats in a maternity colony in Michigan traveled to roost trees 5.1 mi (8.2 km) apart during a summer and traveled as much as 3.6 mi (5.8 km) between roost trees overnight. In addition, females were found to travel 0.3 to 5.2 mi (0.5 – 8.4 km) between roosts and foraging areas (Murray and Kurta 2004; Sparks et al. 2005b).

Methods for Mist Netting

The survey followed the protocol in the draft Indiana bat recovery plan (U.S. Fish and Wildlife Service 2007). Black nylon mist nets (38 mm mesh) were used (Avinet, Inc., Dryden, NY). Two sets of 19.7 foot (6-m) long nets were suspended over a potential flyway. The nets were opened at dusk and monitored for five hours each night.

The following data are recorded for each bat captured: species, sex, age class (juvenile or adult), reproductive condition, and weight. Age class in bats is determined by the degree of closure of the phalangeal epiphyses; juveniles (i.e. young of the year) are recognizable because of the incomplete ossification of the epiphyses (Anthony 1988). The reproductive condition of male bats is determined by the size of the epididymides, which are covered by pigmented sheaths and located lateral to the tail. Sexually mature males have enlarged or distended epididymides that can be seen through the interfemoral membrane (Racey 1988). Pregnant females can be recognized by gently palpating the fetus through the abdomen, and lactating and post-lactating females by examination of the teats. Bats are weighed to the nearest 0.02 oz (0.5 g) by placing them in small cloth or paper bags and suspending the bags from a Pesola scale. Bats are released at the capture site immediately after examination.

Site Description

The nets were suspended over a creek over Forked Creek near the intersection of West Peotone Road and South Walsh Road, Will County (UTM: 418167 mE, 4575064 mN, Figure 1). Dominant trees in the area were cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*) ash (*Fraxinus* sp.) hackberry (*Celtis occidentalis*) and box elder (*Acer negundo*). There were a few dead trees along the edge of the creek, some had peeling bark.

Mist netting was conducted on 6 and 7 August 2012. At dusk on 6 August 2012 the sky was clear and calm; temperature was 79ºF (26.1 ºC). At dusk on 7 August 2012 the temperature was 72ºF (22.2ºC), partly cloudy with a light breeze

Net A, consisted of two 19.7 foot (6-m) long nets suspended between 2 poles reaching a height of 18 ft (5.5 m) (Figure 2). Net A was located 164 feet (50 m) east of the bridge. The north pole was about 3.3 feet (1 m) inside the water's edge followed by a sloped embankment 3.3 feet (1 m) high. The south pole was at the water's edge 6.5 feet (2 m) from the edge of the creek channel (sandy substrate) with a 4.9 feet (1.5 m) embankment. There was no canopy directly over the net. The net was across a pool of water that is 131 feet (40 m) long. There was a partially downed tree ¼ the way across the creek 6.5 feet (2 m) east of net A.

Net B was 98.4 feet (30 m) east of Net A. Net B was 3.3 feet (1 m) from the edge of the same pool of water as Net A. There was a 3.3 foot (1 m) wide band of rocks 3.3 feet (1 m) west of Net B, then there is another pool of water. The north pole was at the water's edge 3.3 feet (1 m) from the base of a steep 19.7 foot (2 m) high embankment. The south pole was in the water 6.5 feet (2 m) from the water's edge. There was a gentle 3.3 foot (1 m) embankment beyond the water. There was no canopy directly over the net. The water depth was 2.5 feet (0.75 m). The creek bottom was a mix of sand, cobble, and some larger rocks. The creek did not have enough water to flow. North of the creek was an area of 328 feet (100 m) of forest adjacent to an agricultural field. South of the creek was forested reaching 246 feet (75 m) to the road.

Mist Netting Results and Conclusions

Six bats of 2 species were captured and identified at nets A and B (Table 1). The species captured were eastern red bats and big brown bats. No Indiana bats were captured at this site.

Table 1. Bats captured at Job No: P-91-749-10 (Seq. No.: 16651A) Will, Kankakee, Grundy, and Kendall counties, IL. 6 to 7 August 2012.

Common Name	Species	No.	Sex	Age	Reproductive Status
Eastern red bat	*Lasiurus borealis*	3	F	J	
		2	M	J	
Big brown bat	*Eptescus fuscus*	1	F	A	NR
		6			

M = male; F = female; A = adult; J = juvenile (young-of-year); P = pregnant; L = lactating; NR = non-reproductive

Habitat Assessment Results

On 17 January 2012 Joseph Merritt, Joyce Hofmann, and Jean Mengelkoch assessed the potential Indiana bat habitat at the 4 sites of avian point counts conducted by Kevin Johnson of INHS (2013) and also the wooded areas in the vicinity of the Kankakee River in the Illiana corridor. These sites were identified using aerial photos to locate wooded areas that were near water and also during previous excursions in and around the project corridor. We documented snags, dead or live trees with peeling bark, and large broken limbs (potentially hollow) in each of the wooded areas. Dominant tree species in the woodlands were provided by Michael Murphy of INHS.

Site A was a small wooded area west of a dense residential area (Figure 5). Most of the area consisted of small trees with a shrubby, dense understory. There were a few medium to large trees along the river (possibly oaks). None of the trees had peeling bark. The dominant

tree species in the area were bur oak (*Quercus macrocarpa*), white oak (*Quercus alba*), silver maple (*Acer saccharinum*), and black cherry (*Prunus serotina*).

Site B was a small wooded area with moderately sized trees (Figure 6). There was a dense understory. One large oak had 2 dead limbs that may have been hollow. Closer to the river the trees were younger with a few larger trees covered in vines. There was a large tree with a broken limb and a small, dead tree with moderately peeling bark and low solar exposure. The dominant tree species in the area were black oak (*Quercus velutina*), black cherry, and white oak.

Site C consisted of young trees and a dense understory (Figure 7). There were 2 snags that possessed no peeling bark and 4 broken limbs on larger trees. The dominant tree species in Site C were black oak and black cherry.

Site D was a small wooded area with young trees and a dense understory (Figure 8). No potential roost trees were identified in this area. The dominant tree species in the area were black oak and black cherry.

Site E was a floodplain forest with large trees and an open understory (Figure 9). We were not able to access this area to look for potential roost trees. The road adjacent to the site was approximately 50 ft above the floodplain and access was not possible down the steep, tall embankment. In addition, there was a waterway that bisected the woodland. A tall chain-link fence and gate prevented possible access from the east side; we were unable to find another way to access the floodplain. From the roadway we did not see any trees that had peeling bark. The dominant tree species in the area were silver maple and green ash (*Fraxinus pennsylvanica*). There were also cottonwood (*Populus deltoides*), but they were not a dominant.

Site F was an Illinois Department of Natural Resource (IDNR) Wildlife Management Area (Figure 10). The trees were mid-sized and the understory was dense and brushy. There was one large dead white oak that had a cavity, low bark potential, and good solar exposure. Dominant trees in the area included black oak, white oak, basswood (*Tilia americana*), and red oak (*Quercus rubra*).

Site G was also an IDNR Wildlife Management Area (Figure 11). The majority of the area consisted of small trees with a dense understory, however on the west end of the site the understory was more open and there were some larger trees. There was 1 tree with a small amount of peeling bark. There were also 2 broken-off trees, a short snag, and 2 other snags without peeling bark. There was one snag and a tree with a broken limb, both of which had cavities. The dominant trees in the area were black oak, green ash, white mulberry (*Morus alba*), and silver maple.

Site H was an area by a pond with scattered large trees (Figure 12). There were multiple large trees with some peeling bark and good solar exposure. The tree species were unknown.

Site I was comprised of young trees and had a dense understory (Figure 13). Dominant trees in the area included green ash, honey locust (*Gleditsia triacanthos*), black cherry, and white mulberry.

Site J consisted of a line of trees between the IDNR Game Farm and the northern edge of the corridor (Figure 14). The most of the trees were young and there was a dense understory. There was 1 snag that did not possess any peeling bark. Dominant trees in the area included green ash, honey locust, black cherry, and white mulberry.

Site K consisted of mostly young trees with a few large trees (Figure 15). The understory was dense. There was 1 tree with multiple broken limbs and 1 tree with a small amount of peeling bark. The dominant tree species in the area were silver maple, green ash, and black walnut (*Juglans nigra*).

Site L consisted of young trees and had a dense understory (Figure 16). This site was near Avian Survey Point 1. Dominant tree species in the area included black oak, black cherry, and green ash.

Site M contained multiple large red oaks (Figure 17). This site was near Avian Survey Point 2. There was 1 snag with minimal peeling bark, 3 short snags without peeling bark, 2 trees with broken branches that had minimal peeling bark, 1 large tree with 2 broken branches, a tree with a cavity in a branch that was broken off, and a tree with a cavity low on the trunk. The dominant tree species in the area were black oak, black cherry, and white oak.

Site N consisted of mostly young trees and had a dense understory. This site was near Avian Survey Point 3. The site had 1 snag without peeling bark, 2 short snags that each had a cavity, and there was 1 tree with a broken limb. Dominant tree species in the area included black oak, white oak, and black cherry.

Site O contained some large trees (Figure 18). There was 1 large oak that had 2 broken limbs. The dominant tree species in the area included white oak, black cherry, and American elm (*Ulmus americana*).

Site P appeared to be a large section of forest on the aerial photo. However, the east end of the site was open and park-like with multiple residences hidden in the trees. The west end of the site consisted of young trees with a few scattered large oaks (Figure 19). The understory was

dense. There was 1 oak snag with a cavity. This site was near Avian Survey Point 4. The dominant tree species in the area were black oak, white oak, silver maple, and black cherry.

Conclusions for Habitat Assessment

The majority of the sites near the Kankakee River did not provide suitable habitat for Indiana bats. Most of the trees were small and did not possess much peeling bark. In addition, the woods had a dense understory. One site that has some potential was Site E, the floodplain forest. The site was large and had many large trees and an open understory.

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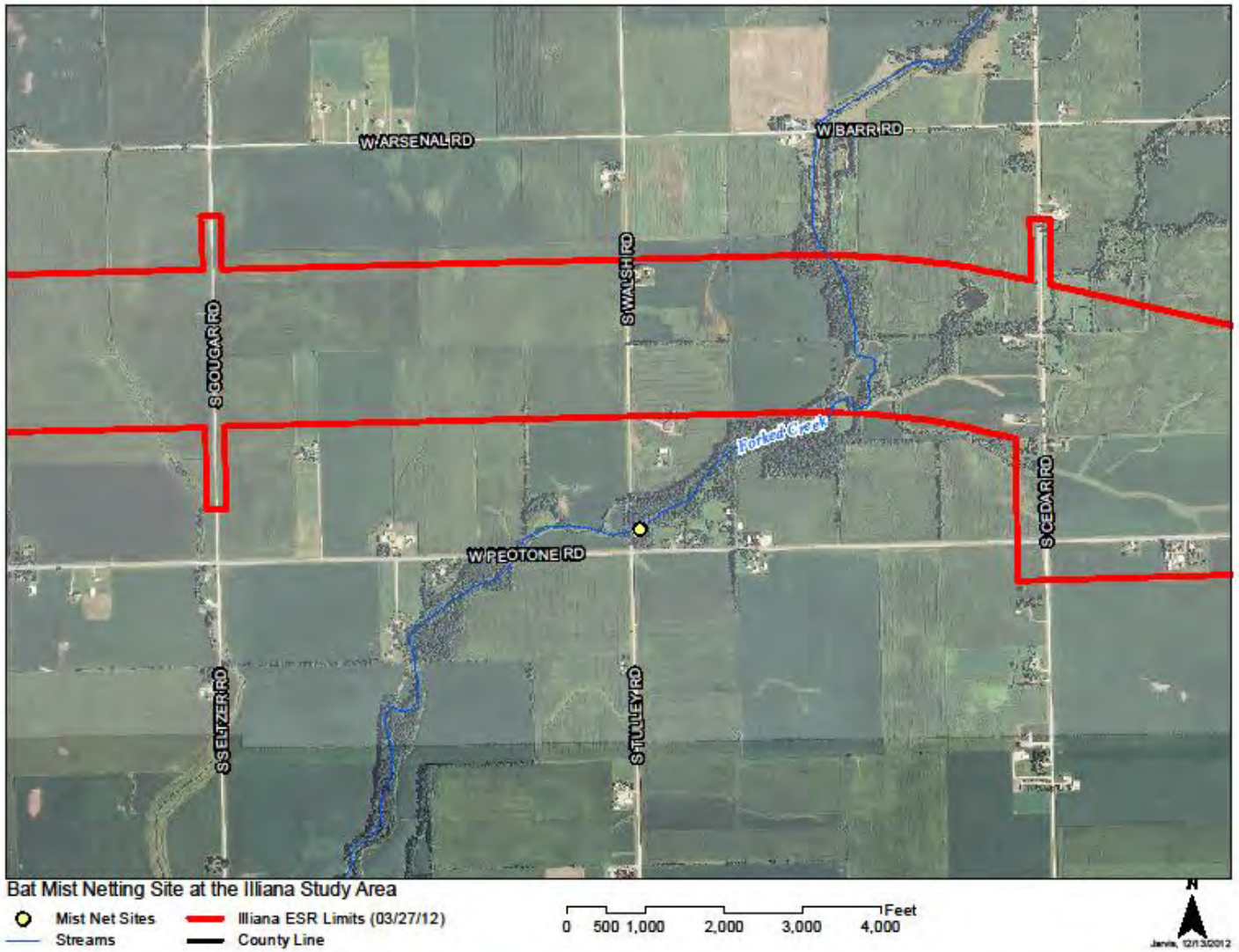


Figure 1. Location of the mist netting site over Forked Creek near Job No: P-91-749-10 (Seq. No.: 16651A) Will, Kankakee, Grundy, and Kendall counties, IL. 6-7 August 2012.

Figure 2. Net A, Job No: P-91-749-10 (Seq. No.: 16651A) Will, Kankakee, Grundy, Kendall and counties, IL. 6-7 August 2012.

Figure 3. Net B, Job No: P-91-749-10 (Seq. No.: 16651A). Will, Kankakee, Grundy, Kendall counties, IL. 6 -7 August 2012.

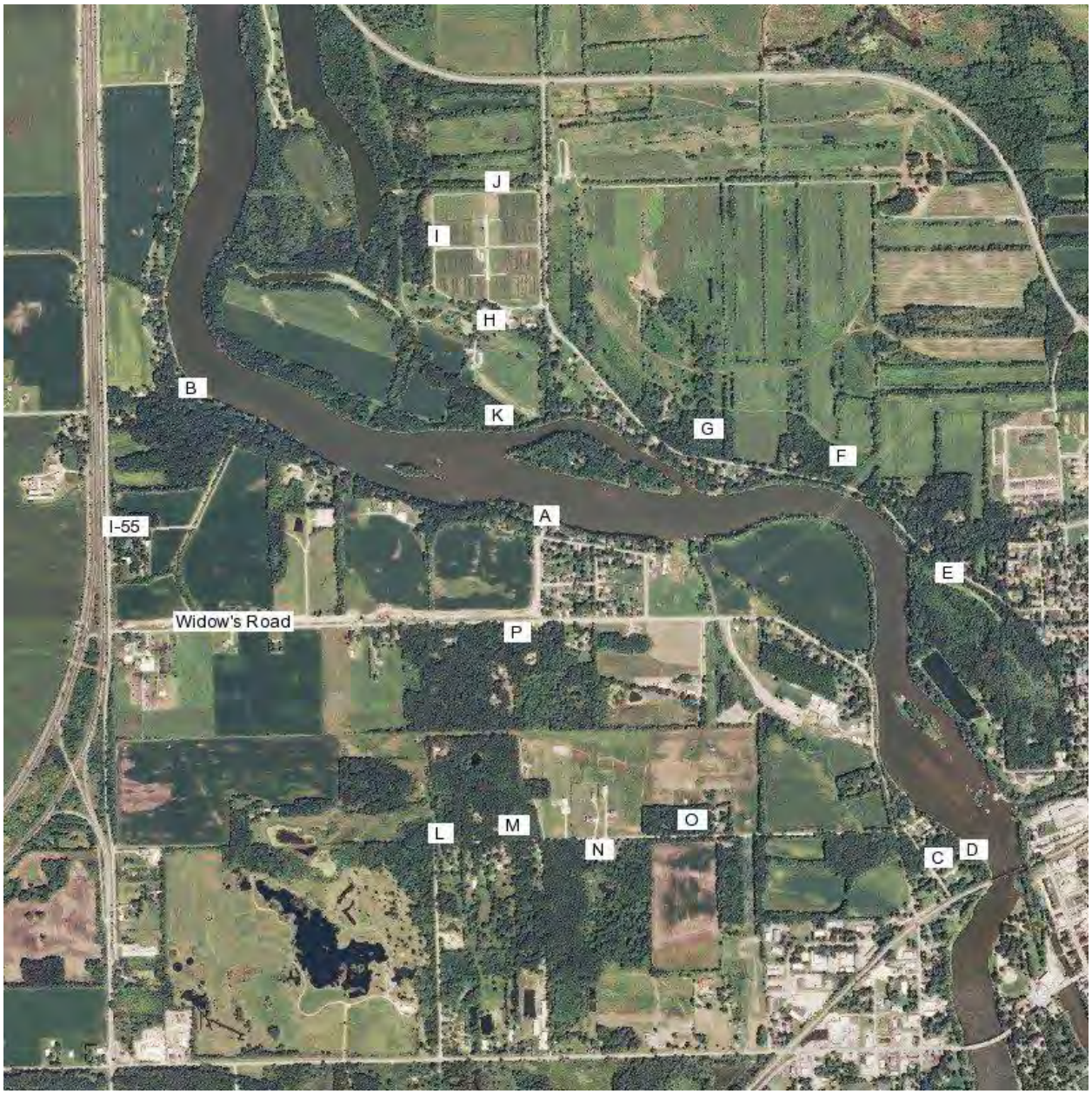


Figure 4. Locations assessed as potential Indiana bat habitat near the Kankakee River by Wilmington, Illinois.

Figure 5. Site A assessed for Indiana bat habitat in the Illiana corridor.

Figure 6. Site B assessed for Indiana bat habitat in the Illiana corridor.

Figure 7. Site C assessed for Indiana bat habitat in the Illiana corridor.

Figure 8. Site D assessed for Indiana bat habitat in the Illiana corridor.

Figure 9. Site E assessed for Indiana bat habitat in the Illiana corridor.

Figure 10. Site F assessed for Indiana bat habitat in the Illiana corridor.

Figure 11. Site G assessed for Indiana bat habitat in the Illiana corridor.

Figure 12. Site H assessed for Indiana bat habitat in the Illiana corridor.

Figure 13. Site I assessed for Indiana bat habitat in the Illiana corridor.

Figure 14. Site J assessed for Indiana bat habitat in the Illiana corridor.

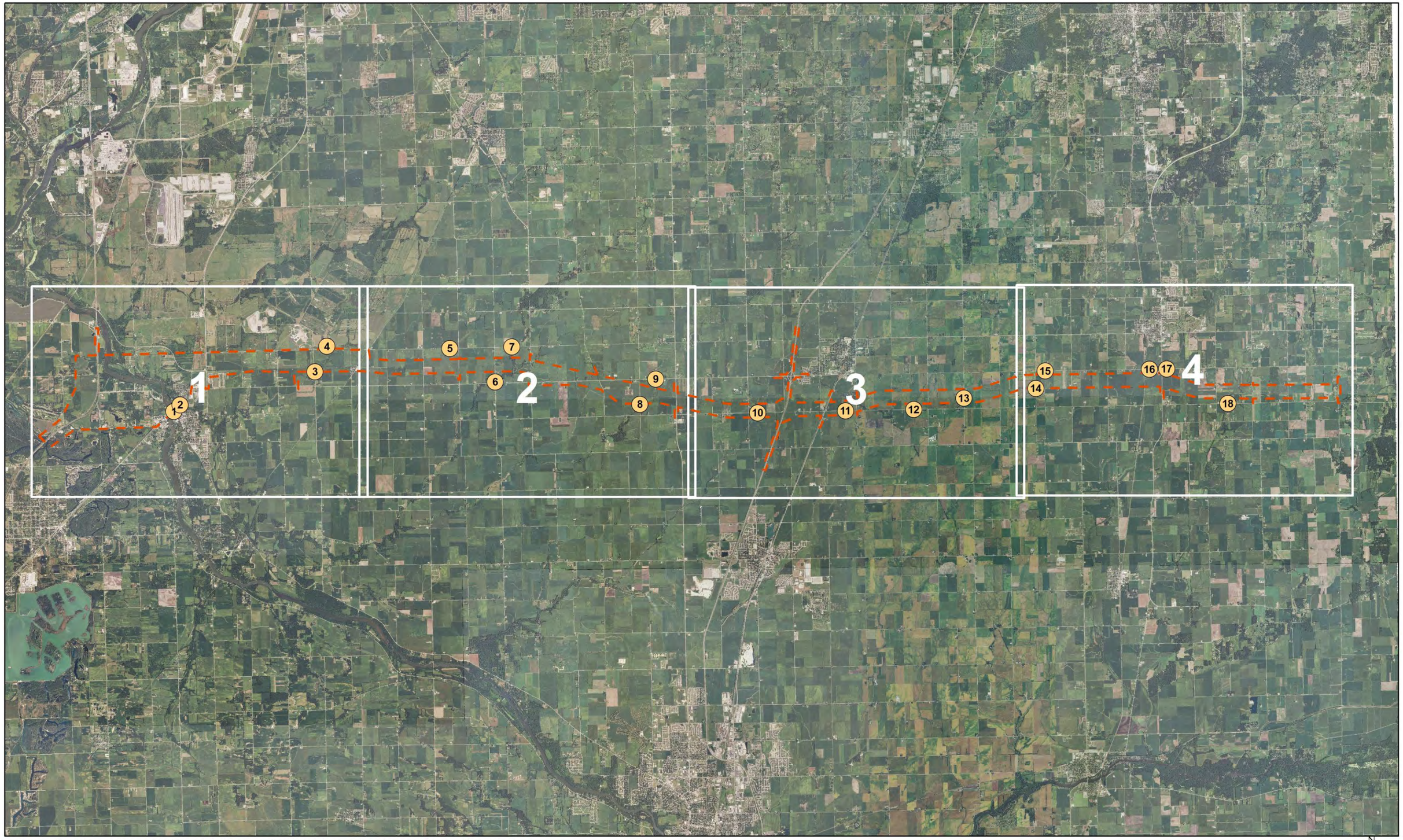
Figure 15. Site K assessed for Indiana bat habitat in the Illiana corridor.

Figure 16. Site L assessed for Indiana bat habitat in the Illiana corridor.

Figure 17. Site M assessed for Indiana bat habitat in the Illiana corridor.

Figure 18. Site O assessed for Indiana bat habitat in the Illiana corridor.

Figure 19. Site P assessed for Indiana bat habitat in the Illiana corridor.



Stream Crossings Examined as Potential Bat Mist Net Sites in the Illiana Corridor

Potential Mist Net Sites

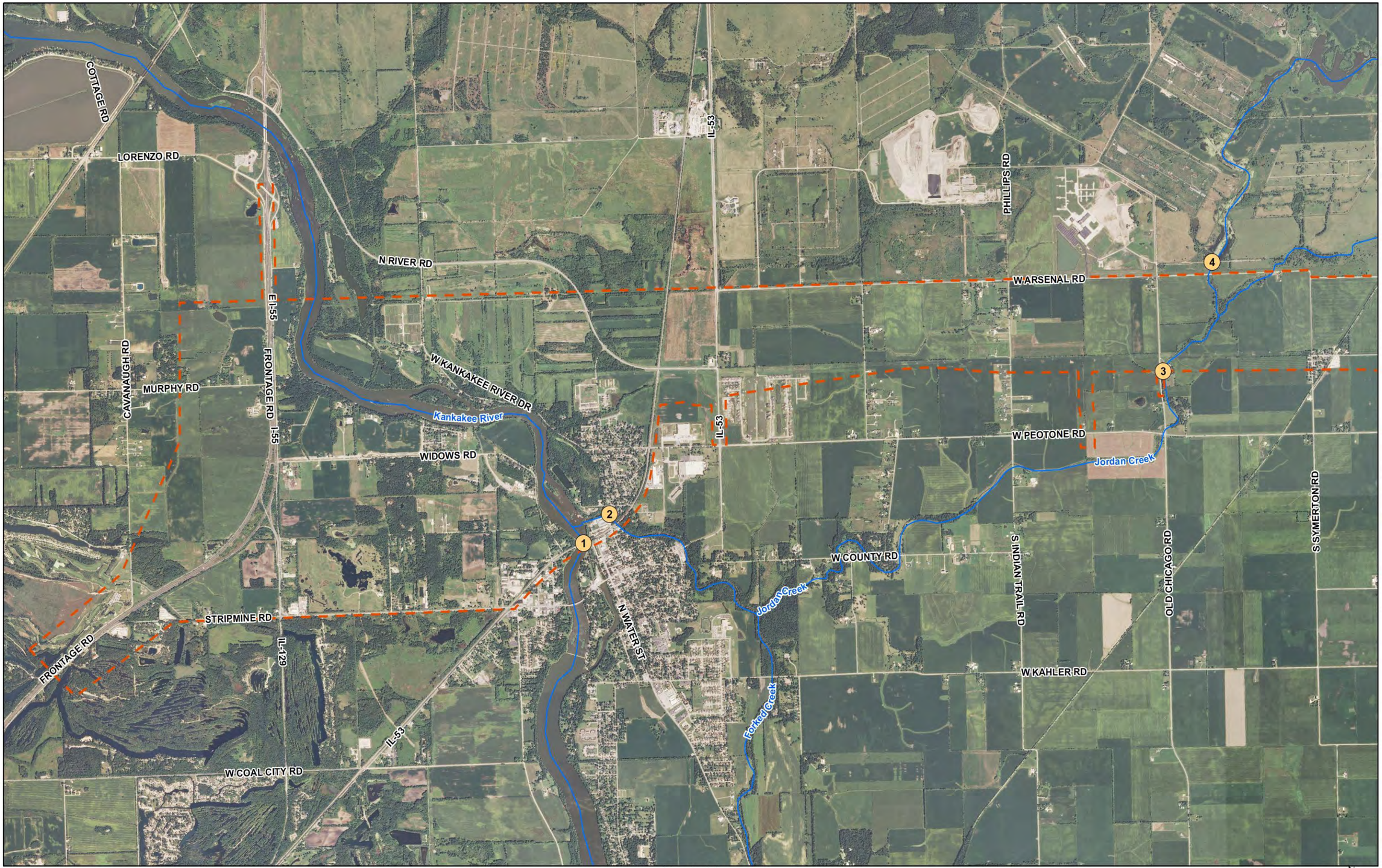
Illiana ESR Limits (03/27/12)

0 1.25 2.5 5 7.5 10 Miles

N

N-734

Jarvis, 2/18/2013



Stream Crossings Examined as Potential Bat Mist Net Sites in the Illiana Corridor

Map 1 of 4

Potential Mist Net Sites — Illiana ESR Limits (03/27/12) — Streams

0 0.5 1 2 Miles

N

Jarvis, 2/18/2013

N-735

Stream Crossings Examined as Potential Bat Mist Net Sites in the Illiana Corridor

Map 2 of 4

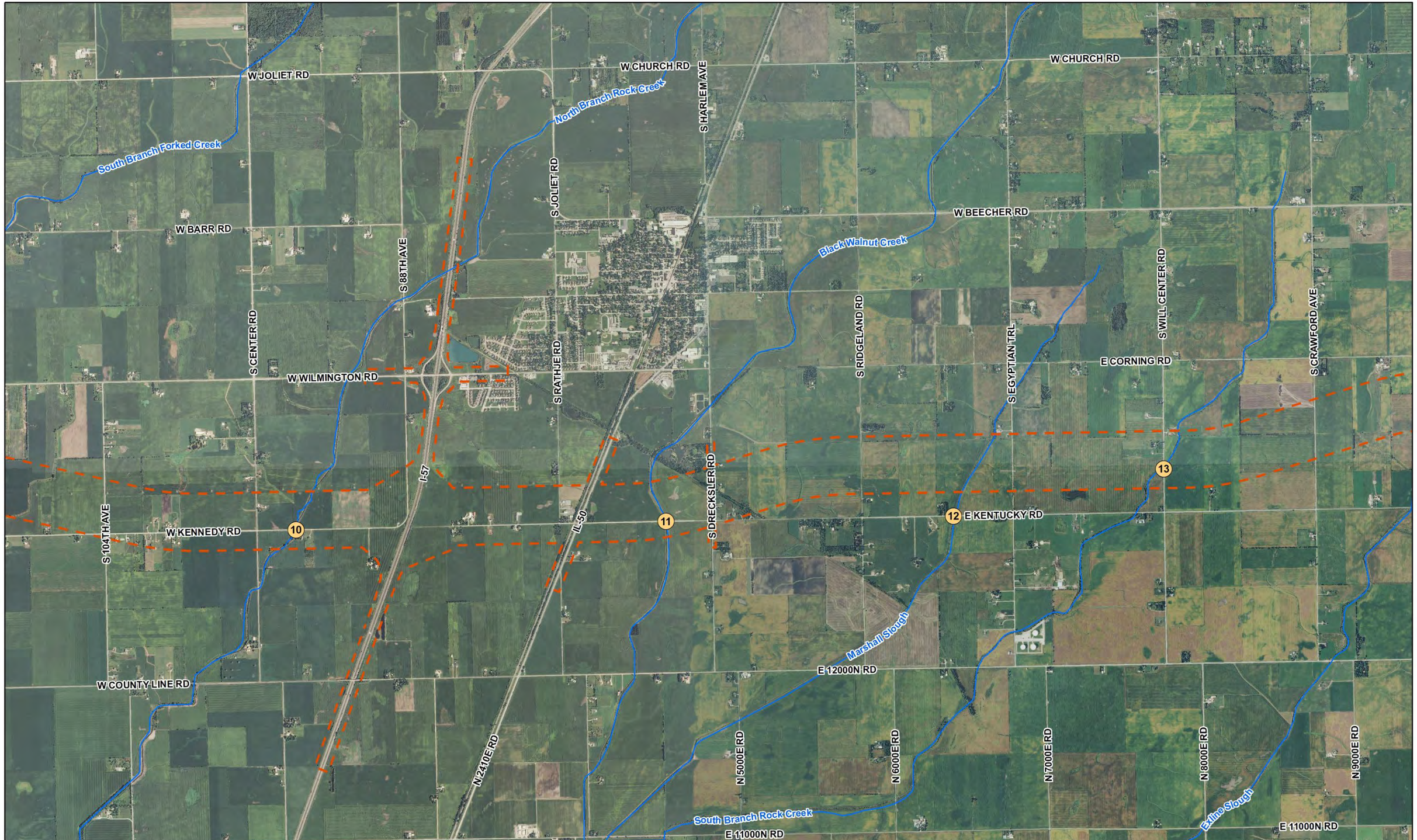
Potential Mist Net Sites — Illiana ESR Limits (03/27/12) — Streams

0 0.5 1 2 Miles

N

N-736

Jarvis, 2/18/2013



Stream Crossings Examined as Potential Bat Mist Net Sites in the Illiana Corridor

Map 3 of 4

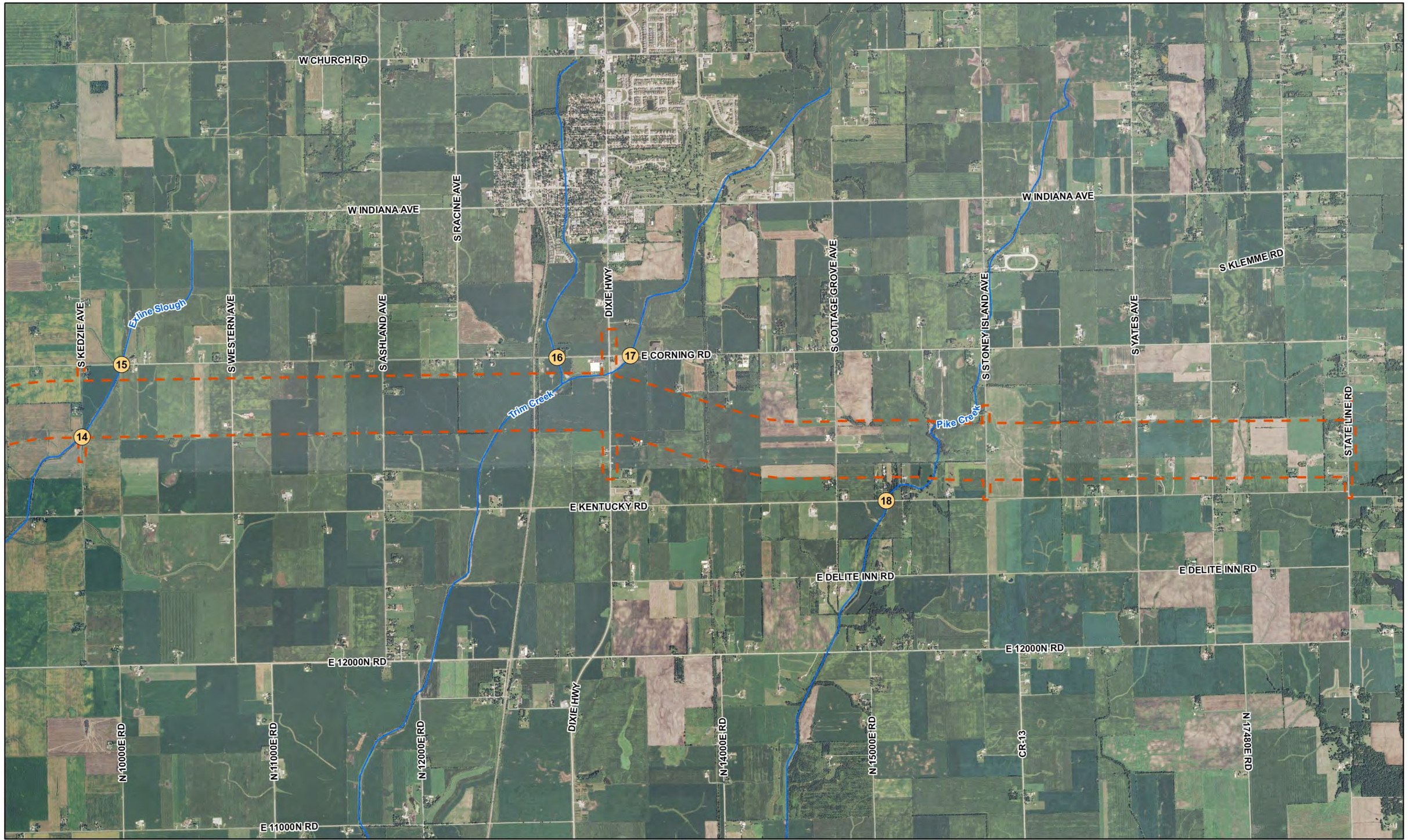
Potential Mist Net Sites — Illiana ESR Limits (03/27/12) — Streams

0 0.5 1 2 Miles

N

N-737

Jarvis, 2/18/2013



Stream Crossings Examined as Potential Bat Mist Net Sites in the Illiana Corridor

Map 4 of 4

Potential Mist Net Sites — Illiana ESR Limits (03/27/12) — Streams

0 0.5 1 2 Miles

N

N-738

Jarvis, 2/18/2013

ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE

Indiana Bat Survey
Illiana Corridor, I-55 to I-65
Job No.: P-92-749-20 (Seq. No.: 16651A and 16651B)
Will, Kankakee, Grundy, and Kendall Counties

Jean M. Mengelkoch, Joseph F. Merritt, Synan Nicholson, Joseph Frumkin, and Stefanie Ervin

30 July 2013

INHS/IDOT

Statewide Biological Survey & Assessment

Program Report 2013(31)

University of Illinois at Urbana-Champaign

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N-739

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Introduction

On 20 March 2012 the Bureau of Design & Environment submitted a request of the Illinois Natural History Survey (INHS) to conduct a survey for bats including the federally endangered Indiana bat (*Myotis sodalis*) in the vicinity of the Illiana Corridor, I-55 to I-65 (Seq. Nos.:16651A and 16651B). The project consists of the construction of the Illiana between I-55 and I-65. In early 2013 the U.S. Fish and Wildlife Service requested additional surveys at sites outside of, but within five miles of, the Illiana corridor. The locations were selected based on potential Indiana bat habitat by Shawn Cirton with the U.S. Fish and Wildlife Service (USFWS) in conjunction with Juanita Armstrong from the Will County Forest Preserve District (WCFPD) and Joseph Merritt with INHS.

Records and Previous Surveys

The Illinois Natural Heritage Database has no records of Indiana bats from Will, Kankakee, Grundy, or Kendall Counties. Neither Hoffmeister (1989) nor Hofmann (2008) reported the occurrence of Indiana bats from these counties. In addition, for many years, bats tested for rabies by the Illinois Department of Public Health have been sent to the INHS for identification. According to this database, the Indiana bat has not been reported from Will, Kankakee, Grundy or Kendall Counties (INHS Rabies Specimen Database, maintained by J.E. Hofmann).

Hofmann (2005) mist netted bats at one site in Will County for the I-55 and Arsenal Road IDOT project. No bats were captured. Whitaker and Everson (2005a) mist netted five additional sites for the I-55 and Arsenal Road IDOT project. No Indiana bats were captured. Three sites in Messenger Woods were mist netted in 2005 (Hofmann and Amundsen 2005a); no Indiana bats were caught. Netting was conducted along the Des Plaines River at Lemont Road and Spring

Creek near IL 6 during July 2005 (Whitaker and Everson 2005b); no Indiana bats were caught. In 2005 netting was unsuccessful at two sites on the Des Plaines River (Keepataw Preserve and Lockport Prairie; Hofmann and Amundsen 2005a and b).

In 2007, seven sites were mist netted at Midewin National Tallgrass Prairie (Widowski et al. 2007); no Indiana bats were caught. From 2008 to FY2009 Midewin conducted a comprehensive bat survey to determine whether or not Indiana bats were present on site and what other bat species were on site (Midewin National Tallgrass Prairie 2009). No Indiana bats were captured on Midewin. Two sites at Goodenow Grove Nature Preserve and two sites in Hickory Creek Forest Preserve were mist netted in 2006 and 2007, respectively (Hofmann et al. 2008); no Indiana bats were captured.

Natural History of Indiana Bats

Indiana bats congregate in caves or abandoned mines for hibernation, but are more widely dispersed during the summer (Barbour and Davis 1969). Maternity colonies primarily roost beneath slabs of exfoliating bark on dead trees, but also have been found beneath the "shaggy" bark of certain live hickories (*Carya*) and oaks (*Quercus*), and in tree crevices (Cope et al. 1973; Humphrey et al. 1977; Gardner et al. 1991; Kurta et al. 1993a, b, 1996, 2002; Callahan et al. 1997; Carter 2003). Maternity colonies, however, recently have been found roosting in buildings (a church, house, and barn), artificial roosting structures (e.g., bat houses), and utility poles (Carter et al. 2001; Butchkoski and Hassinger 2002; Chenger 2003; Hendricks et al. 2005; Kurta 2005; Ritzi et al. 2005). Males and non-reproductive females use caves, mines, bridges, and artificial roosting structures as well as trees for diurnal roosts during summer (Mumford and Cope 1958; Gardner et al. 1991; Salyers et al. 1996; Ford et al. 2002; INHD).

Many known maternity roost trees have been relatively large, with a dbh (diameter at breast height) of at least 12 in (30 cm) (e.g., Gardner et al. 1991; Kurta et al. 1993a, 1996; Callahan et al. 1997; Whitaker and Brack 2002). Female and juvenile Indiana bats have been documented roosting in more than 30 species of trees (Kurta 2005). Tree species known to have been used by Indiana bat maternity colonies in Illinois are northern red oak (*Q. rubra*), white oak (*Q. alba*), post oak (*Q. stellata*), pin oak (*Q. palustris*), slippery elm (*Ulmus rubra*), American elm (*U. americana*), shagbark hickory (*C. ovata*), bitternut hickory (*C. cordiformis*), silver maple (*Acer saccharinum*), cottonwood (*Populus deltoides*), sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), and sweetgum (*Liquidambar styraciflua*) (Gardner et al. 1991, Kurta et al. 1993a, Carter 2003). A maternity colony uses more than one tree during the summer (e.g., Gardner et al. 1991; Kurta et al. 1996; Callahan et al. 1997), but the number of roost trees a colony needs presumably is variable (Menzel et al. 2001). A colony in Michigan roosted in 23 trees (Kurta et al. 1996) and four Missouri colonies used 10-20 roost trees each (Callahan et al. 1997). In Michigan, members of a maternity colony occupied trees that were up to 5.1 mi (8.2 km) apart during a summer and traveled as much as 3.6 mi (5.8 km) between roost trees overnight (Kurta et al. 2002). Individual roost trees have a limited "lifespan," making them an ephemeral resource (Gardner et al. 1991).

Trees used by Indiana bats in Illinois have been located in upland and floodplain forests, a swamp, and pastures (Gardner et al. 1991; Kurta et al. 1993a; Carter 2003). There is a consensus that Indiana bat maternity colonies occupy primary roosts that are exposed to high levels of solar radiation (Menzel et al. 2001). The death of an overstory tree creates a light-gap in the forest canopy that exposes remaining trees to solar radiation. Dead trees along forest edges or in areas impacted by flooding also have high levels of exposure to sunlight. Some

alternate maternity roosts, as well as roosts used by male Indiana bats, are in shaded locations (Gardner et al. 1991, Callahan et al. 1997). Most Indiana bat roost trees have been close to (or surrounded by) water (e.g., Humphrey et al. 1977; Gardner et al. 1991; Callahan et al. 1997; Kurta et al. 1996, 2002; Carter 2003), but some have been found more than 1.2 mi (2 km) from a perennial stream (Gardner et al. 1991, Kurta et al. 1993a). Trees occupied by reproductively active female and juvenile Indiana bats in Illinois (n = 56) were rarely within 1637 ft (500 m) of a paved highway (Gardner et al. 1991). In contrast, a maternity colony in Indiana recently was found roosting in trees near a major highway (J.M. Mengelkoch, personal observation). Some adult male Indiana bats roosted less than 786 ft (240 m) from a paved highway in Illinois (Gardner et al. 1991) and an adult male in West Virginia occupied a tree only 43 ft (13 m) from a road (Ford et al. 2002).

Most Indiana bat maternity colonies in the Midwest have been found in landscapes that were a mosaic of forest and agricultural areas (Cope et al. 1973; Humphrey et al. 1977; Gardner et al. 1991; Kurta et al. 1993a, b, 2002; Callahan et al. 1997; Carter 2003). Despite the fact that they roost in trees, the presence of Indiana bats does not seem to be correlated with forest cover. In Missouri, for example, the amount of forest cover did not differ significantly between sites where Indiana bats were captured and not captured (Miller et al. 2002). In Illinois, Carter et al. (2002) found significantly fewer and smaller patches of urban development in the vicinity of Indiana bat roosts than at random sites. There also was less residential land around Indiana bat capture sites than unsuccessful netting sites in Missouri (Miller et al. 2002). Belwood (2002), however, documented a maternity colony occupying trees in a wooded subdivision in Ohio and a colony near the Indianapolis Airport occupies a rural area surrounded by urban/suburban development (Whitaker et al. 2004, Sparks et al. 2005a).

Although more needs to be learned about habitat requirements of Indiana bat maternity colonies at the landscape level (Menzel et al. 2001, U.S. Fish and Wildlife Service 2007), it seems reasonable that sustainable habitat would include a variety of snags, hickories, and numerous large, senescent trees that would provide future roost sites. Requirements for foraging habitat are less restrictive; habitats used by foraging Indiana bats include riparian corridors, wetlands, upland forests, ponds, and fields (Menzel et al. 2001).

The Indiana bat was listed as a federal endangered species in 1967. Recently, a rapidly spreading bat disease (white-nose syndrome, WNS) spread by the cold-adapted ascomycete fungus, *Geomyces destructans* has become a leading cause of mortality of several species of North American hibernating bats (Blehert et al. 2009; Frick et al. 2010). WNS was confirmed in Illinois bats by the Illinois Department of Natural Resources (IDNR) on 28 February 2013 (http://whitenosesyndrome.org/partner/illinois-department-natural-resources). Currently, 20 states, mostly in the eastern U.S. , and five Canadian Provinces have been confirmed to exhibit WNS- infected bats; seven species are affected, namely, little brown bat, big brown bat, northern long-eared bat, tri-colored bat, eastern small-footed bat, the endangered Indiana bat, and the endangered gray bat. In Illinois, two species of bats, the little brown bat and northern long-eared bat have been confirmed to exhibit WNS; as of 3 May 2013, WNS was confirmed in four Illinois counties: LaSalle, Monroe, Hardin and Pope Counties (C. Butchkoski, PA Game Commission, pers. comm.). However, as of 28 February 2013, WNS has not been confirmed in Illinois for *M. sodalis.*

Methods for Mist Netting

The survey followed the protocol in the 2013 Revised Indiana Bat Summer Survey Guidelines (U.S. Fish and Wildlife Service 2013). Black nylon mist nets (1.5 inch mesh) were used (Avinet, Inc., Dryden, NY). Two sets of nets of varying lengths were suspended over a potential flyway. The nets were opened at dusk and monitored for five hours each night.

The following data were recorded for each bat captured: species, sex, age class (juvenile or adult), reproductive condition, and weight. Age class in bats is determined by the degree of closure of the phalangeal epiphyses; juveniles (i.e. young of the year) are recognizable because of the incomplete ossification of the epiphyses (Anthony 1988). The reproductive condition of male bats is determined by the size of the epididymides, which are covered by pigmented sheaths and located lateral to the tail. Sexually mature males have enlarged or distended epididymides that can be seen through the interfemoral membrane (Racey 1988). Pregnant females can be recognized by gently palpating the fetus through the abdomen, and lactating and post-lactating females by examination of the teats. Bats are weighed to the nearest 0.02 oz by placing them in small cloth or paper bags and suspending the bags from a Pesola scale. Bats are released at the capture site immediately after examination.

Site Selection

Multiple Will County Forest Preserves were initially selected by Shawn Cirton (US FWS) and Juanita Armstrong (WCFPD) as sites possessing potential Indiana bat habitat within five miles of the Illiana corridor. On 29 April 2013, they met with Joseph Merritt of INHS to make a final selection of forest preserves based on site visits and availability of mist netting locations. Five forest preserves were selected. The selected preserves were Forsythe Woods in

Forked Creek Preserve, Donohue Grove Preserve, Laughton Preserve, Raccoon Grove Nature Preserve, and Goodenow Grove Nature Preserve (Overview Map). The USFWS requested that two sites be mist netted at each forest preserve. The two sites included one mist netting site over water and one mist netting site in the interior of the woods over a trail or road. There was one exception—at Laughton Preserve only one mist netting site (a water site) was selected.

Site Descriptions

Photos of each site may be found in the Appendix.

Forsythe Woods Site 1: east of the parking lot on Kahler Road on a trail (Symerton 7.5' topographic quadrangle; UTM 405744mE, 4572863mN, Zone 16 NAD 83); 8 and 9 July 2013; Map 1. Net A was composed of 20-ft long nets suspended over the juncture of two trails. There was no tree canopy directly over the net, but there was a canopy just west of the net. Net B was composed of 20-ft long nets suspended over a trail about 100 ft east of Net A. There was a partial canopy over the net. The woods at this site had a dense under- and over-story. Trees in the area included catalpa (*Catalpa speciosa*), black walnut (*Juglans nigra*), ash (*Fraxinus* sp.), and white mulberry (*Morus alba*). The site is located 1.3 miles from the Illiana corridor.

Forsythe Woods Site 2: Will County Nature Preserve, west of Forked Creek (Symerton 7.5' topographic quadrangle; UTM 405781mE, 4572783mE, 4m, Zone 16 NAD 83); 8 and 9 July 2013; Map 1. Net A (north-south) was located approximately 40 feet from Net B (east-west). Net A has a net of about 30 feet in length and net B a line of 8.5 feet in length. Net A paralleled Forked Creek, and located a distance of about 10 feet from the edge of the creek. Forked Creek is about 20 feet wide reaching a depth of about 3-5 feet. Two large white oaks on the north end of Net A form a continuous canopy over net A. The oaks reach a height of about 100 feet.

However, as one moves north toward Net B the canopy becomes discontinuous and low, dominated by successional species of plants such as catalpa (*Catalpa speciosa*), white mulberry (*Morus alba*) and autumn olive (*Elaeagnus umbellate)*. Much of the area north of Line B is mowed to accommodate a picnic table for visitors. Net B was perpendicular to Net A with an open canopy. The species of trees between the net A and B were: white oak group (*Quercus* section *Quercus*), black walnut (*Juglans* nigra), autumn olive (*Elaeagnus umbellate*), ash (*Fraxinus* sp.), white mulberry (*Morus alba*) and catalpa (*Catalpa speciosa*). The site is located 1.3 miles from the Illiana corridor.

Donohue Grove Site 1: south of Donahue Road on the entrance road to the deer processing building (Symerton 7.5' topographic quadrangle; UTM 411772mE, 4567456mN, Zone 16 NAD 83); 18 and 19 June 2013; Map 1. Net A consisted of 6-m long nets suspended over a 20-ft wide gravel road. There was a partial tree canopy over the net. Net B, consisting of 30-ft long nets, was suspended over the same gravel road, 100 ft north of Net A, and extended into an opening in the trees. There was not a tree canopy directly over the net, but there was one nearby. Tree species included red oak group (*Quercus* section *Lobatae*), hickory (*Carya* sp.), ash (*Fraxinus* sp.), and black walnut (*Juglans nigra*). The site is located 4.8 miles from the Illiana corridor.

Donohue Grove Site 2: south of Donahue Road west the entrance road to the deer processing building on a small creek (Symerton 7.5' topographic quadrangle; UTM 411705mE, 4567484mN, Zone 16 NAD 83); 10 and 11 July 2013; Map 1. Net A consisted of 8.5-ft long nets suspended over a small creek that was up to a foot deep. There was a canopy over the net. Net B consisted of 8.5-ft long nets suspended over the creek about 100 ft upstream of Net A. There were several downed trees over the creek between the nets and on either side of the nets. There was a partial canopy over the net. The trees at the site included a mix of large red oak

group (*Quercus* section *Lobatae*) and white oak group (*Quercus* section *Quercus*) trees with smaller elm (*Ulmus* sp.) and black cherry trees (*Prunus serotina*). There was a moderately dense understory. The site is located 4.8 miles from the Illiana corridor.

Laughton Preserve: adjacent to Forked Creek (Wilton Center 7.5' topographic quadrangle; UTM 42098mE, 457898mN, 8m, Zone 16 NAD 83); 10 and 11 July 2013; Map 2. Net A is perpendicular to Net B with spacing of 90 feet. The nets run across Forked Creek. Net A is 30 feet long and Net B is 20 feet long. Forked Creek possesses steep embankments with a muddy bottom and sporadic cobble on the sides of the creek. The width of the creek is about 30 feet. Depth of the water ranges from 1 to 2 feet. There is no canopy over Forked Creek. On the north end of the site there are several snags across the stream interwoven with profuse woody debris. The embankment on the east side of the creek possesses an herbaceous cover of grasses. Several silver maples (*Acer saccharinum*) on the east side reach a height of about 150 feet. There are no large snags at the site. Tree species are as follows: red maple (*Acer rubrum*), black walnut (*Juglans nigra*), hackberry (*Celtis occidentalis.*), and silver maple (*Acer saccharinum*). The site is located 1.9 miles from the Illiana corridor.

Raccoon Grove Site 1: a trail west of the parking lot on entrance road west of the nature center (Steger 7.5' topographic quadrangle; UTM 437054mE, 4583000mN, Zone 16, NAD 83); 15 and 16 July 2013; Map 3. Net A was composed of 20-ft long nets suspended over a dirt trail. There was a canopy about 10 ft over the net. Net B was composed of 20-ft long nets suspended over a dirt trail about 100 ft west of Net A. There was a partial canopy over the net. The site had some large trees with some smaller trees intermixed and an open understory. Trees in the area included red oak group (*Quercus* section *Lobatae*), white oak group (*Quercus* section *Quercus*) ,

elm (*Ulmus* sp.), and sugar maple (*Acer saccharum*). The site is located 4.8 miles from the Illiana corridor.

Raccoon Grove Site 2: adjacent to Rock Creek (Steger 7.5' topographic quadrangle; UTM 437218mE, 4582850mN, 8 m; Zone 16 NAD 83); 15 and 16 July 2013; Map 3. Two nets were established, both Net A and Net B measured 20 feet long. Both nets spanned Rock Creek. Net A was south of Net B. The net- to- net distance was 90 feet and ran parallel to Rock Creek. Rock Creek was composed of cobble; the width between the 3-foot embankments was about 18 feet. The trees formed a continuous canopy with a well-defined corridor over the nets. Several large cottonwoods were present over the stream reaching a height of about 150 feet. Other large trees were white oaks and sugar maples. The forest composition was as follows: cottonwood (*Populus deltoides*), white oak group (*Quercus* section *Quercus*), sugar maple (*Acer saccharum*), elm (*Ulmus* sp.), red bud (*Cercis canadensis*) and black walnut (*Juglans nigra*). The site is located 4.8 miles from the Illiana corridor.

Goodenow Grove Site 1: on Scout trail north of the westernmost parking lot in Goodenow Grove Nature Preserve (Dyer 7.5' topographic quadrangle; UTM 449129mE, 4583697mN, Zone 16, NAD 83); 17 and 18 July 2013; Map 3. Net A was composed of 20-ft long nets suspended over a gravel trail. There was a partial canopy over the net. Net B was composed of 20-ft long nets suspended over a gravel trail about 100 ft south of Net A. There was no tree canopy directly over the net; however, there was a lower tree canopy over the trail nearby. The site is composed of larger oak trees with lots of smaller trees intermixed. Trees in the area include red oak group (*Quercus* section *Lobatae*), white oak group (*Quercus* section *Quercus*), and hickory (*Carya* sp.). The site is located 5.2 miles from the Illiana corridor.

Goodenow Grove Site 2: adjacent to Rock Creek; (Dyer 7.5' topographic quadrangle; UTM 449470mE, 4583853, 8 m, Zone 16 NAD 83); 17 and 18 July 2013; Map 3. Two nets were established; Net A was 20 feet long and Net B was 8.5 feet in length. Net A was north of Net B and traversed a "horse trail" located adjacent to Rock Creek. Net B was positioned across Rock Creek. The stream bed was composed of cobble and stream flow was ephemeral. Net A was positioned 90 feet from Net B. There was a continuous canopy of trees over both nets possessing a well-defined corridor. The maximum height of the canopy was about 100 feet. A paved road was located about 75 feet east of the stream. The tree species in the vicinity were as follows: shagbark hickory (*Carya ovata*), red oak group (*Quercus* section *Lobatae*), black cherry (*Prunus serotina*), red bud (*Cercis canadensis*), elm (*Ulmus* sp.), and white oak group (*Quercus* section *Quercus*). The site is located 5.3 miles from the Illiana corridor.

Mist Netting Results

Twenty-four bats of three species (big brown bat, red bat, and northern bat) were captured during the surveys (Table 1). Big brown bats were captured at Raccoon Grove Sites 1 and 2. Eastern red bats were captured at Donohue Grove Site 1, Laughton Preserve, and Goodenow Grove Site 2. One northern bat was caught at Donohue Grove Site 1. An unidentified tree bat (*Lasiurus* sp.) escaped from the net before it could be removed at Forsythe Woods Site 1. No bats were captured at the Forsythe Woods Site 2, Donohue Grove Site 2, or Goodenow Grove Site 2 (Table 1). No Indiana bats were caught at any of the nine sites within the five Will County Forest Preserves that were mist netted.

Table 1. Bat captures at mist-netting sites in Will County, Illinois, 2013.

Common Name	Species	No.	Age	Sex	Reprod.
Forsythe Woods Site 1 (8 and 9 July)					
tree bat	*Lasiurus* sp.	--	--	--	--*
Forsythe Woods Site 2 (8 and 9 July)					
No captures					
Donohue Grove Site 1 (18 and 19 July)					
eastern red bat	*Lasiurus borealis*	1	A	F	L
northern bat	*Myotis septentrionalis*	1	A	F	
Donohue Grove Site 2 (10 and 11 July)					
No captures					
Laughton Preserve (10 and 11 July)					
eastern red bat	*Lasiurus borealis*	1	A	M	NR
Raccoon Grove Site 1 (15 and 16 July)					
big brown bat	*Eptesicus fuscus*	2	A	F	L
		1	A	F	
		3	A	M	
Raccoon Grove Site 2 (15 and 16 July)					
big brown bat	*Eptesicus fuscus*	7	A	F	NR
		4	A	M	NR
		1	J	M	NR
		2	--	--	--*
Goodenow Grove Site 1 (19 and 20 July)					
No captures					
Goodenow Grove Site 2 (19 and 20 July)					
eastern red bat	*Lasiurus borealis*	1	A	F	PL

M=male; F=female; A=adult; J-juvenile (young of the year); PL=post-lactating; NR=non-reproductive; * = escaped before age and sex could be determined

Conclusions

Nine sites within five Will County Forest Preserves were mist netted during the summer of 2013. The forest preserves included Forsythe Woods in Forked Creek Preserve, Donohue Grove Preserve, Laughton Preserve, Raccoon Grove Nature Preserve, and Goodenow Grove Nature Preserve. The forest preserves and mist netting sites within the preserves were selected by Shawn Cirton (USFWS), Juanita Armstrong (WCFPD), and Joseph Merritt (INHS). These preserves represented the potentially suitable Indiana bat habitat within five miles of the Illiana corridor (Seq. No.:16651A and 16651B).

Twenty-four bats of three species (big brown bat, red bat, and northern bat) were captured. Bats were caught in six of the nine forest preserves. No Indiana bats were caught at any of the nine sites within the five Will County Forest Preserves that were mist netted.

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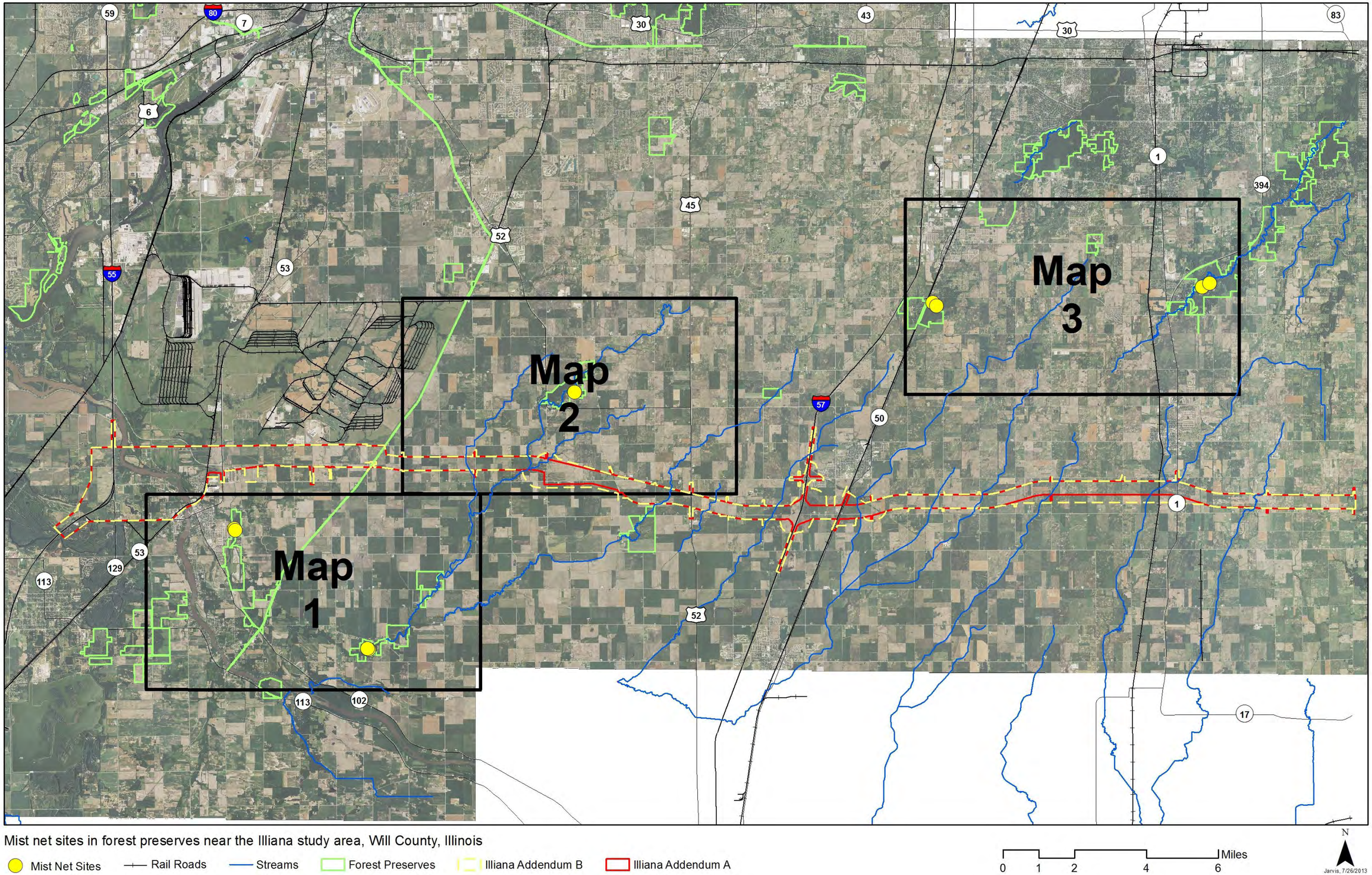

Overview Map. Overview of Illiana study area and the mist netting locations at the Will County Forest Preserves, Summer 2013.

Mist net sites in Forsythe Woods and Donohue Grove Preserve near the Illiana study area, Will County, Illinois

Mist Net Sites — Rail Roads — Streams — Forest Preserves — Illiana Addendum B — Illiana Addendum A

0 0.5 1 2 Miles

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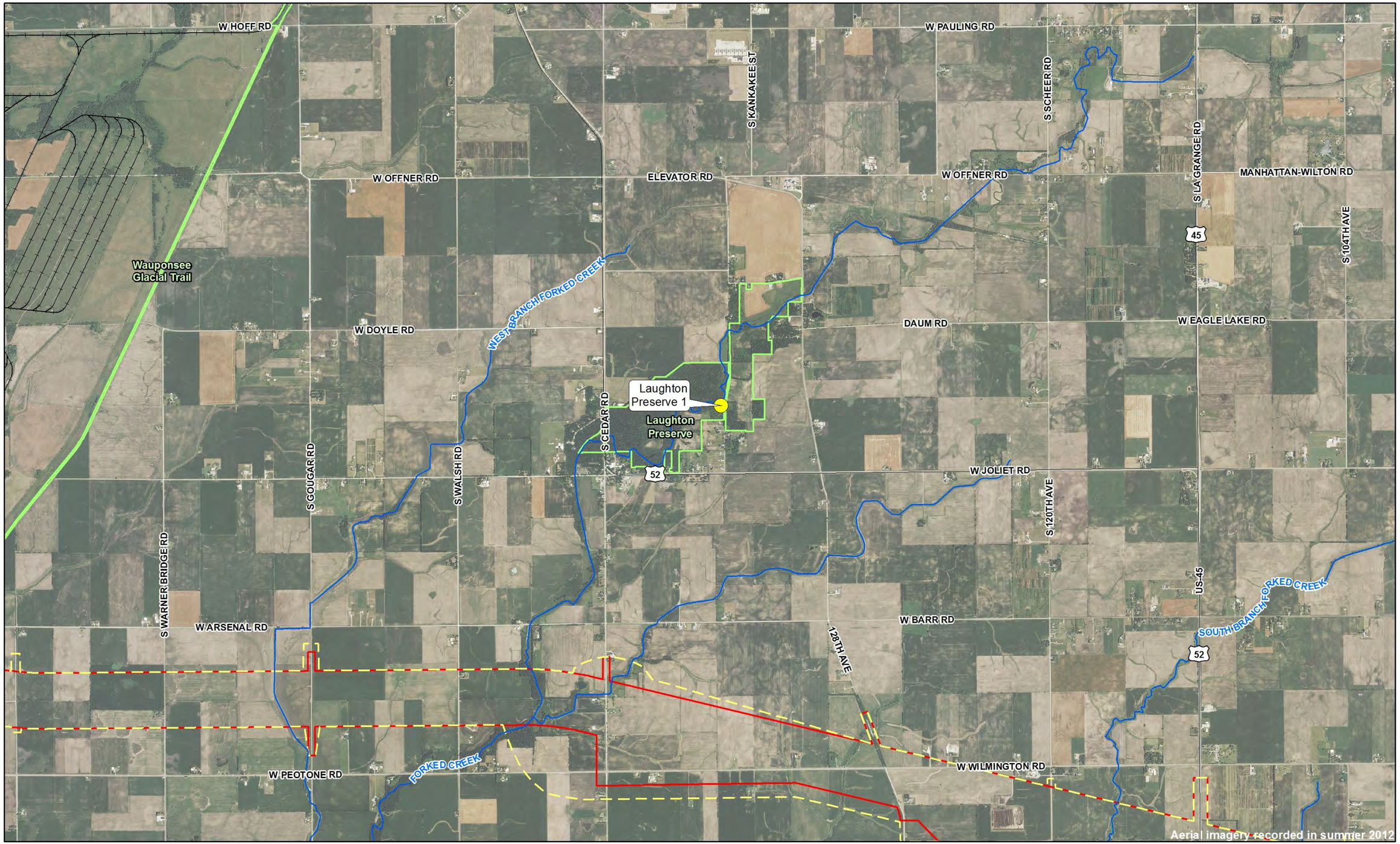
Jarvis, 7/26/2013

Map 1. Location of mist netting sites at Forsythe Woods and Donohue Grove Forest Preserves in Will County, Illinois, Summer 2013.



Mist net sites in Laughton Preserve near the Illiana study area, Will County, Illinois

Mist Net Sites — Rail Roads — Streams — Forest Preserves — Illiana Addendum B — Illiana Addendum A

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Jarvis, 7/26/2013

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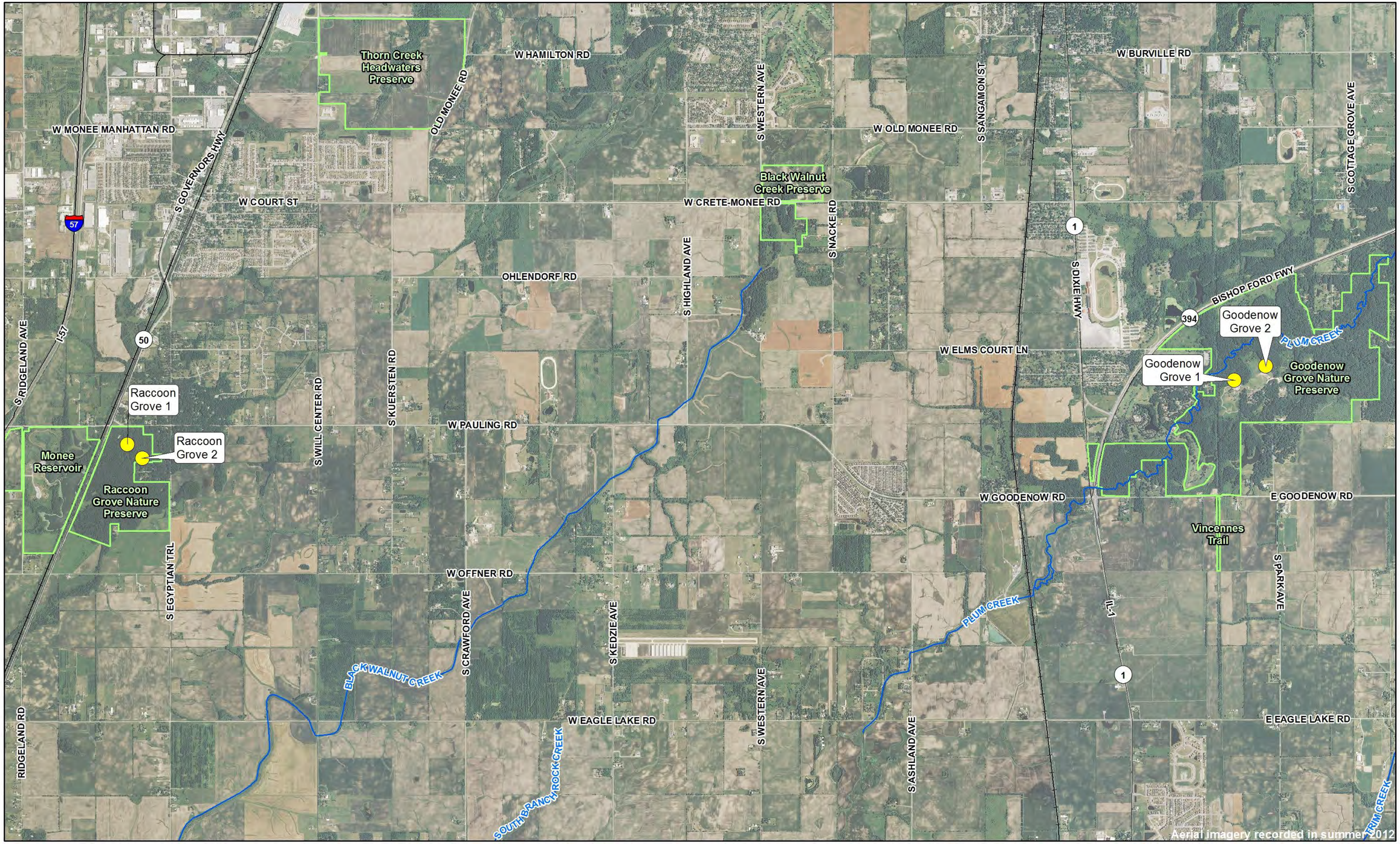
Map 2. Location of mist netting site at Laughton Preserve, Will County, Illinois, Summer 2013.



Mist net sites in Raccoon Grove and Goodenow Grove Nature Preserves near the Illiana study area, Will County, Illinois

Mist Net Sites — Rail Roads — Streams — Forest Preserves — Illiana Addendum B — Illiana Addendum A

0 0.5 1 2 Miles

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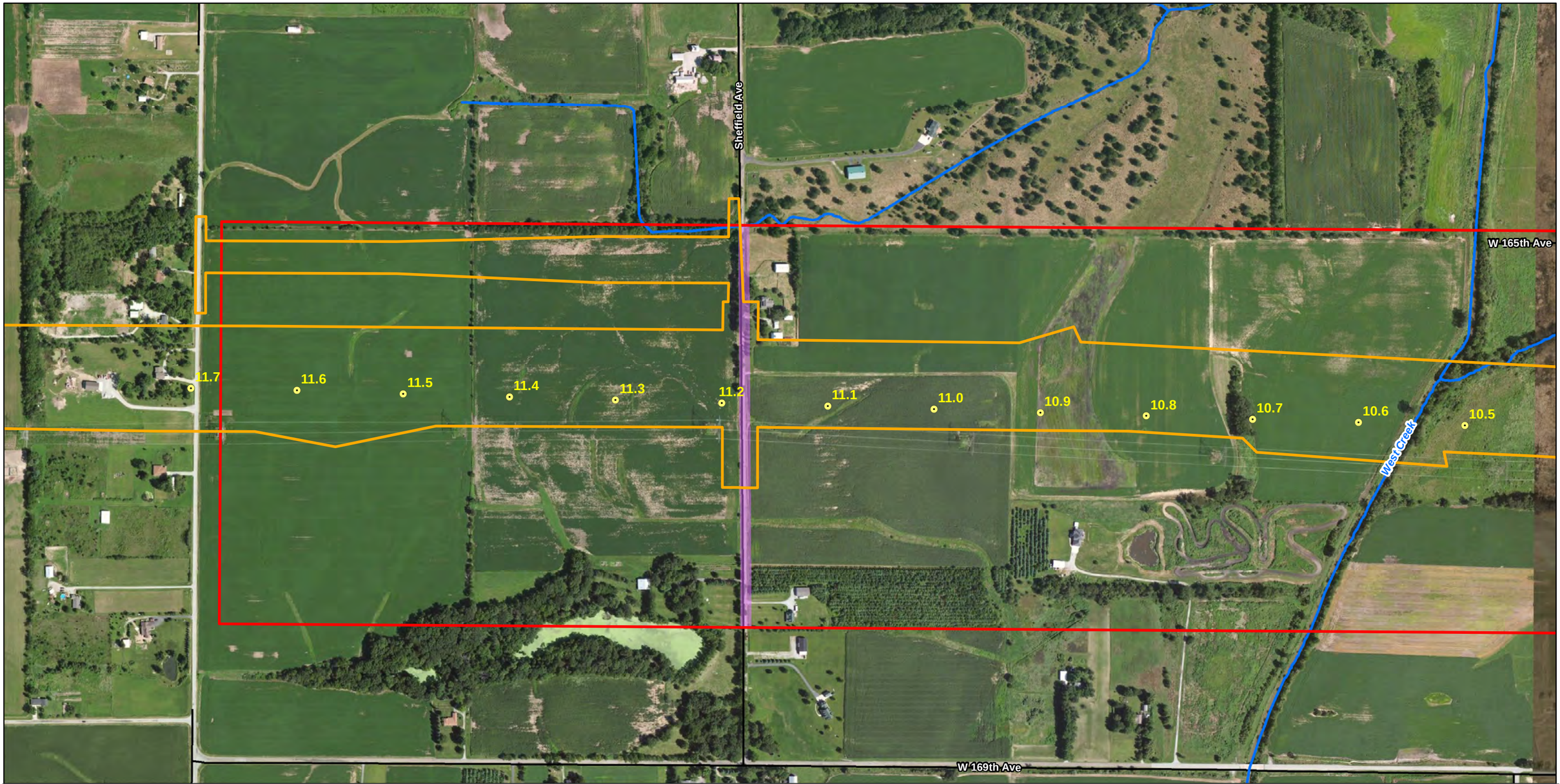
Jarvis, 7/26/2013

Map 3. Location of mist netting sites at Raccoon Grove and Goodenow Grove Preserves in Will County, Illinois, Summer 2013.

Propoed B3 June Footprint
Proposed Corridor
State Endangered Species
Species of Special Concern
Avian Survey
Wildlife sign
Amphibians and Reptiles
Bird sighted
Mammals
Incidental Amphibians and Reptiles
Incidental Bird sighted
Incidental Mammals
Incidental Mollusks
Home Owner Interview
Bird Windshield Survey
Habitat



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Township:33 N
Range: 8, 9 W
Project No: 1012012

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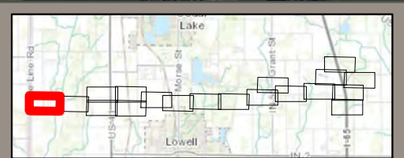

Appendix B -Wildlife Maps
Illiana Expressway
Parsons Brinkerhoff
Lake County, Indiana

0 410 820 1,640 Feet

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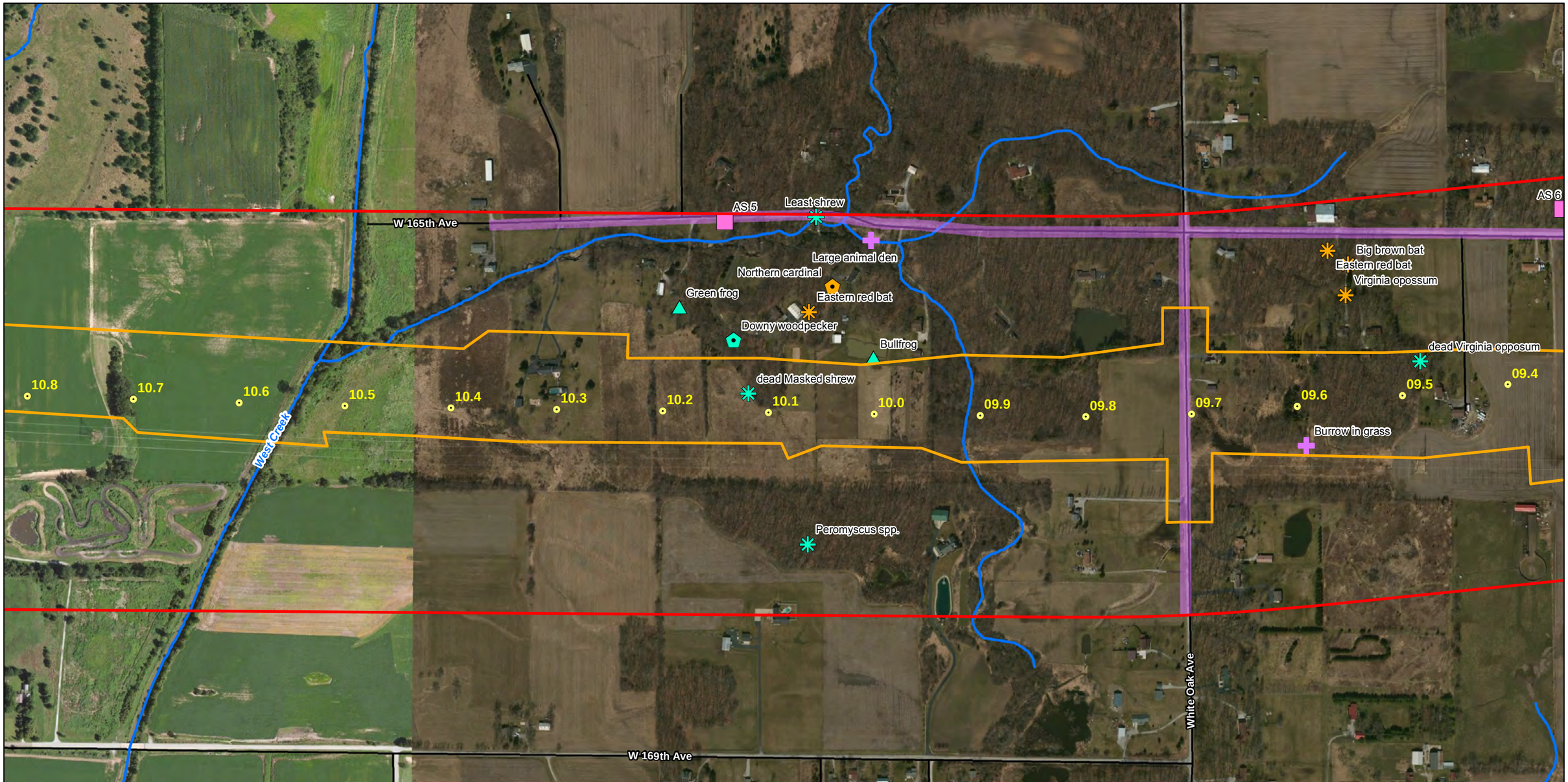
Data Sources:

GIS Analyst: christine.dittmar

Propoed B3 June Footprint
Proposed Corridor
State Endangered Species
Species of Special Concern
Avian Survey
Wildlife sign
Amphibians and Reptiles
Bird sighted
Mammals
Incidental Amphibians and Reptiles
Incidental Bird sighted
Incidental Mammals
Incidental Mollusks
Home Owner Interview
Bird Windshield Survey
Habitat



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Township:33 N
Range: 8, 9 W
Project No: 1012012

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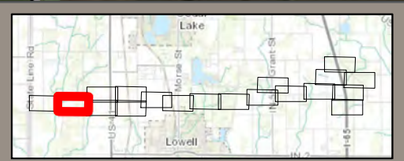

Appendix B -Wildlife Maps
Illiana Expressway
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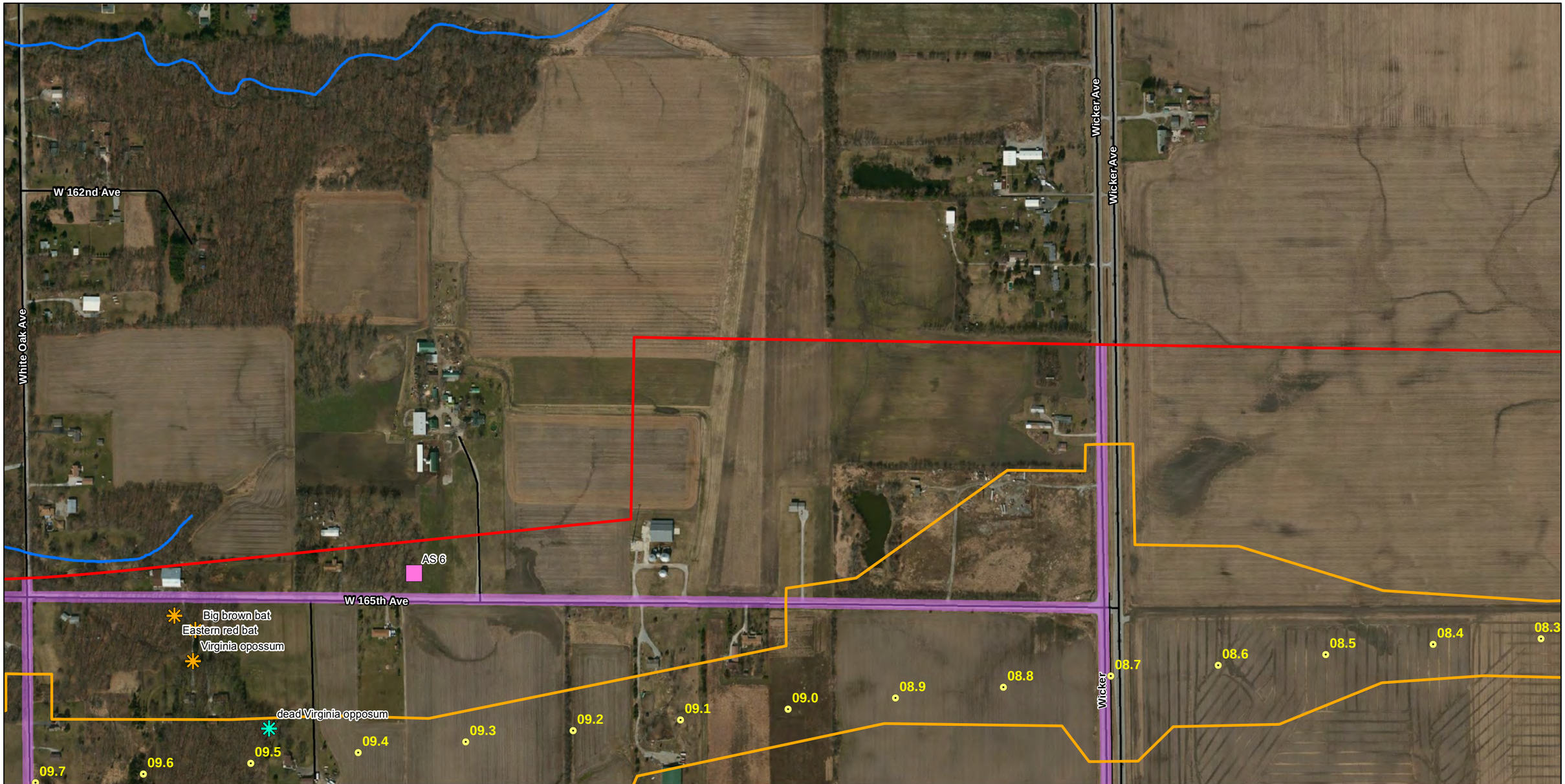
Data Sources:

GIS Analyst: christine.dittmar

Propoed B3 June Footprint
Proposed Corridor
State Endangered Species
Species of Special Concern
Avian Survey
Wildlife sign
Amphibians and Reptiles
Bird sighted
Mammals
Incidental Amphibians and Reptiles
Incidental Bird sighted
Incidental Mammals
Incidental Mollusks
Home Owner Interview
Bird Windshield Survey
Habitat



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Township:33 N
Range: 8, 9 W
Project No: 1012012

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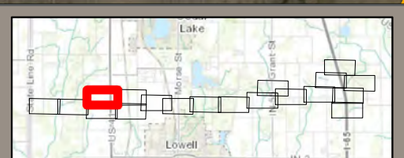

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Illiana Expressway
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Lake County, Indiana

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Data Sources:

GIS Analyst: christine.dittmar

Propoed B3 June Footprint
Proposed Corridor
State Endangered Species
Species of Special Concern
Avian Survey
Wildlife sign
Amphibians and Reptiles
Bird sighted
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Incidental Mammals
Incidental Mollusks
Home Owner Interview
Bird Windshield Survey
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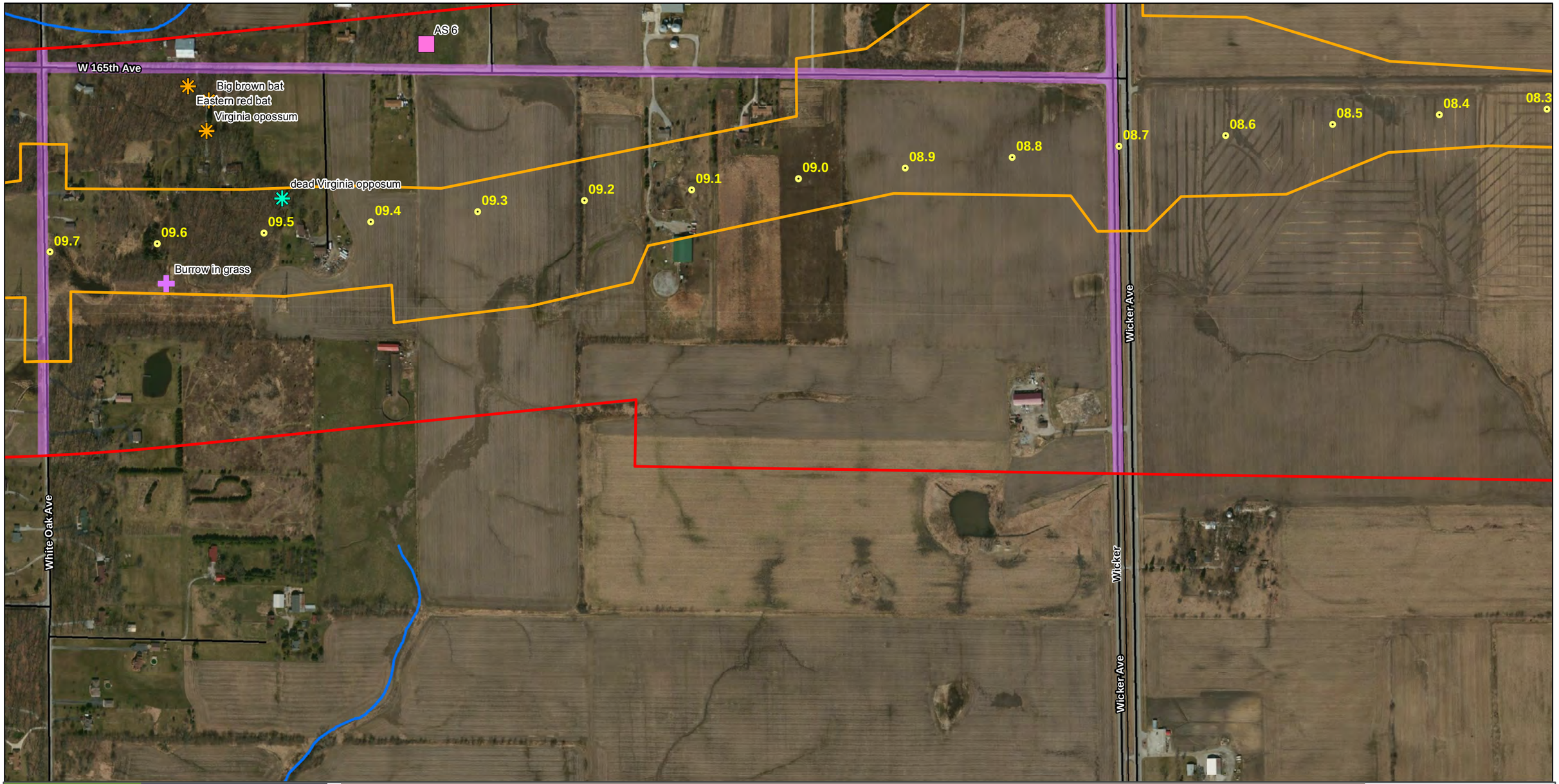

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Township:33 N
Range: 8, 9 W
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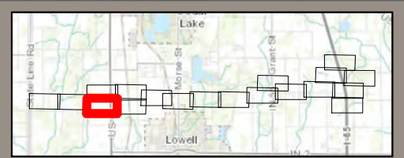

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Lake County, Indiana

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Data Sources:
GIS Analyst: christine.dittmar

Propoed B3 June Footprint
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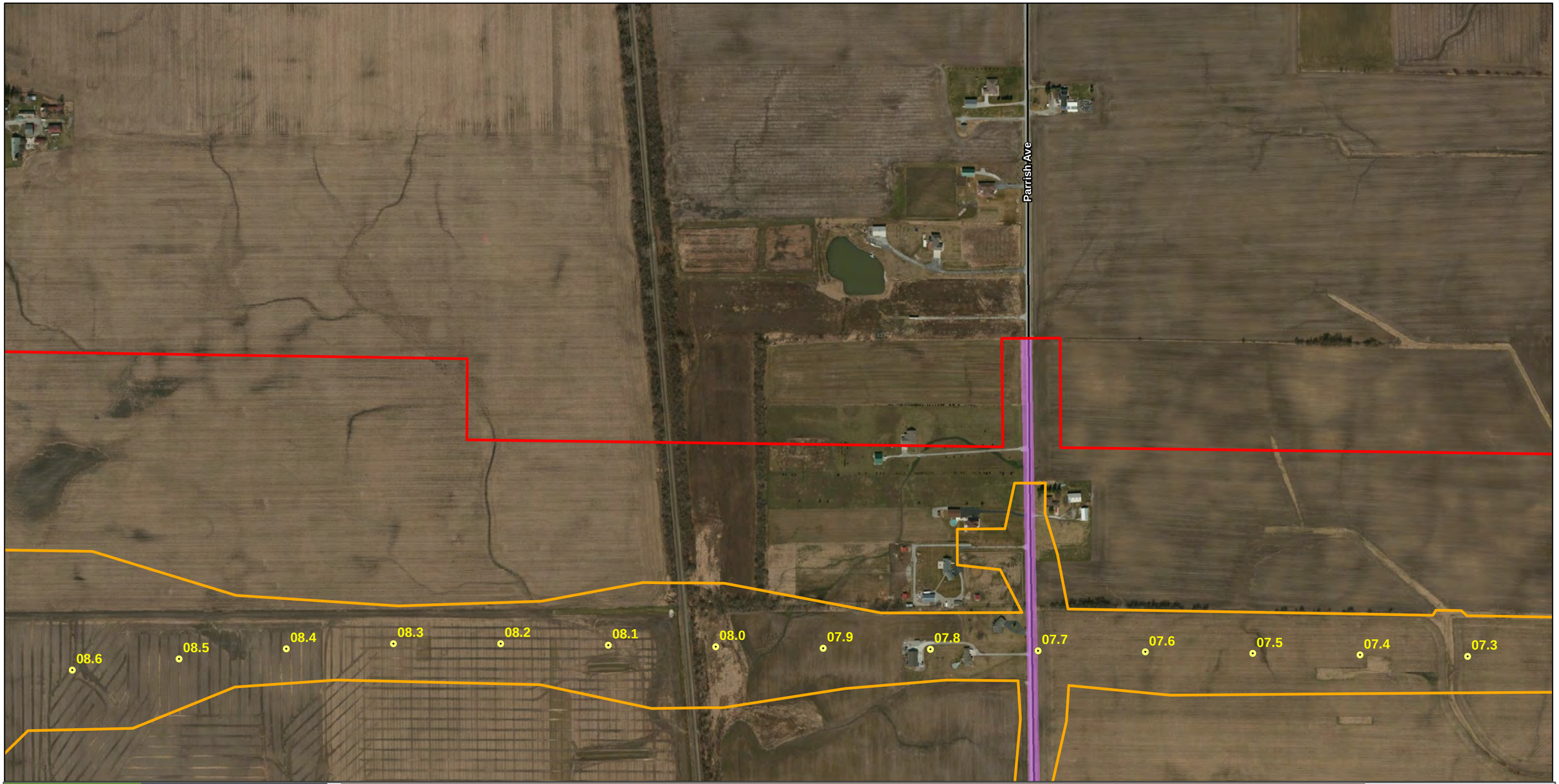

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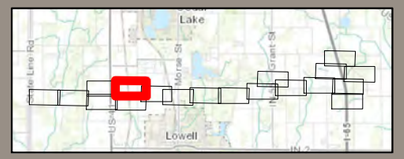

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Data Sources:
GIS Analyst: christine.dittmar

Propoed B3 June Footprint
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Avian Survey
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Amphibians and Reptiles
Bird sighted
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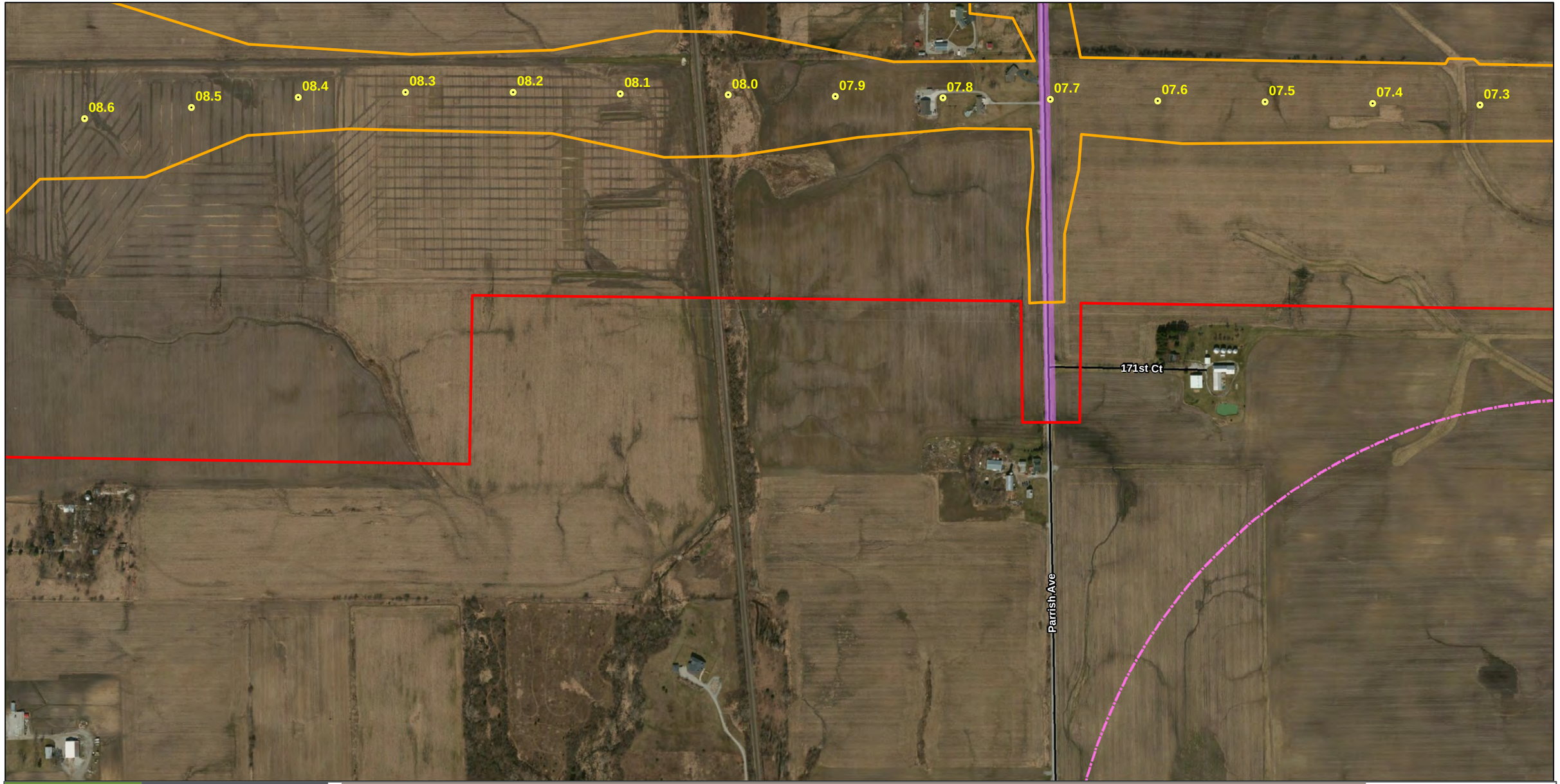

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Township:33 N
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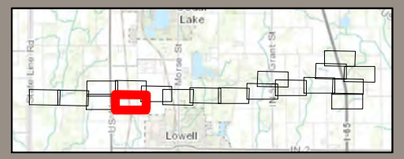

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GIS Analyst: christine.dittmar

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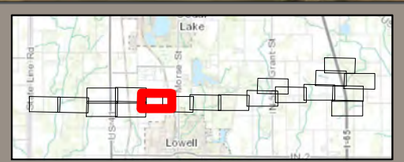

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GIS Analyst: christine.dittmar

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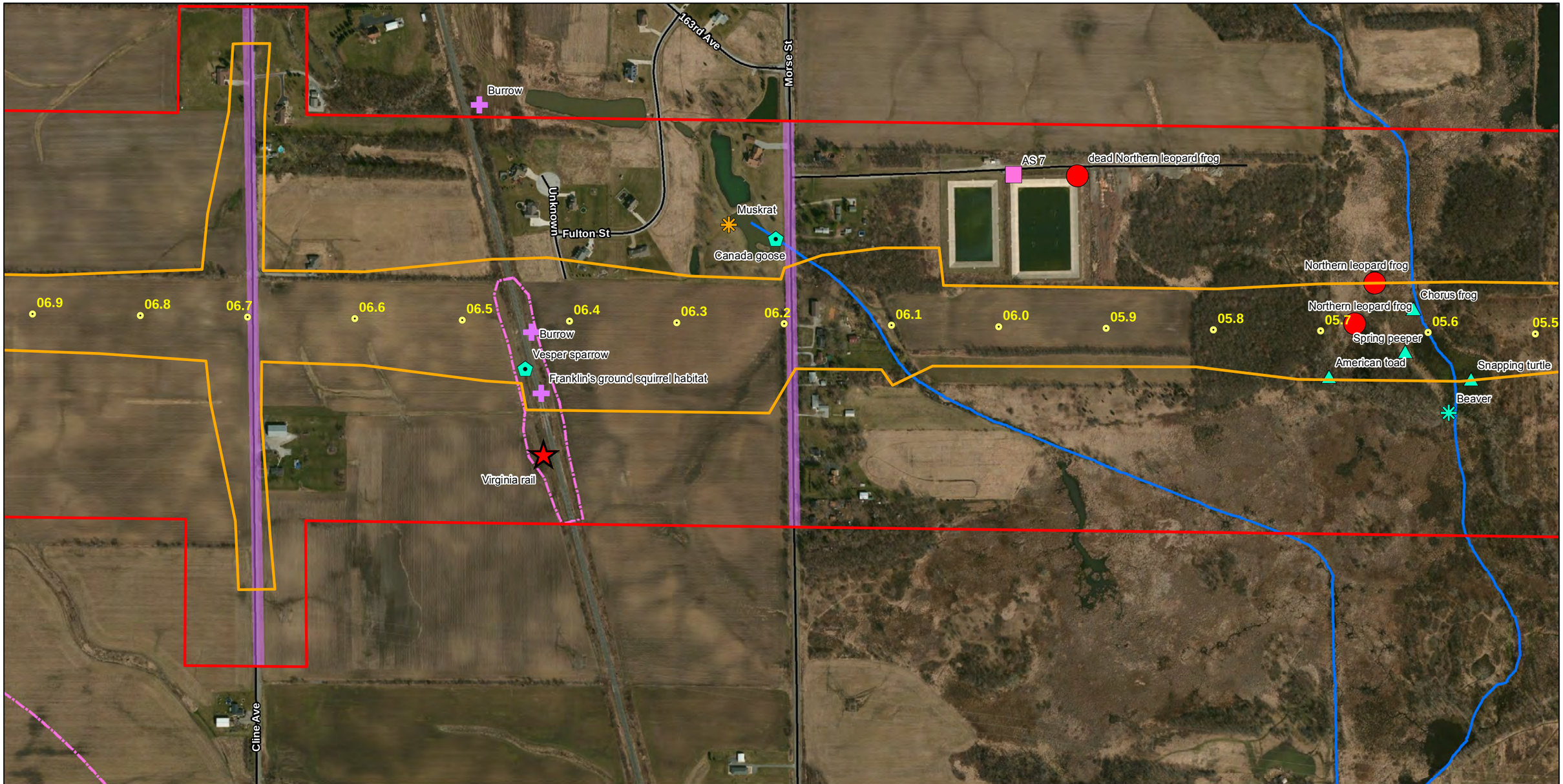

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Township:33 N
Range: 8, 9 W
Project No: 1012012

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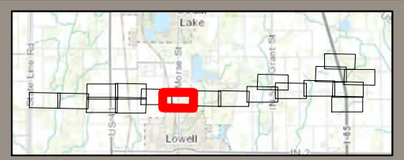

Appendix B -Wildlife Maps
Illiana Expressway
Parsons Brinkerhoff
Lake County, Indiana

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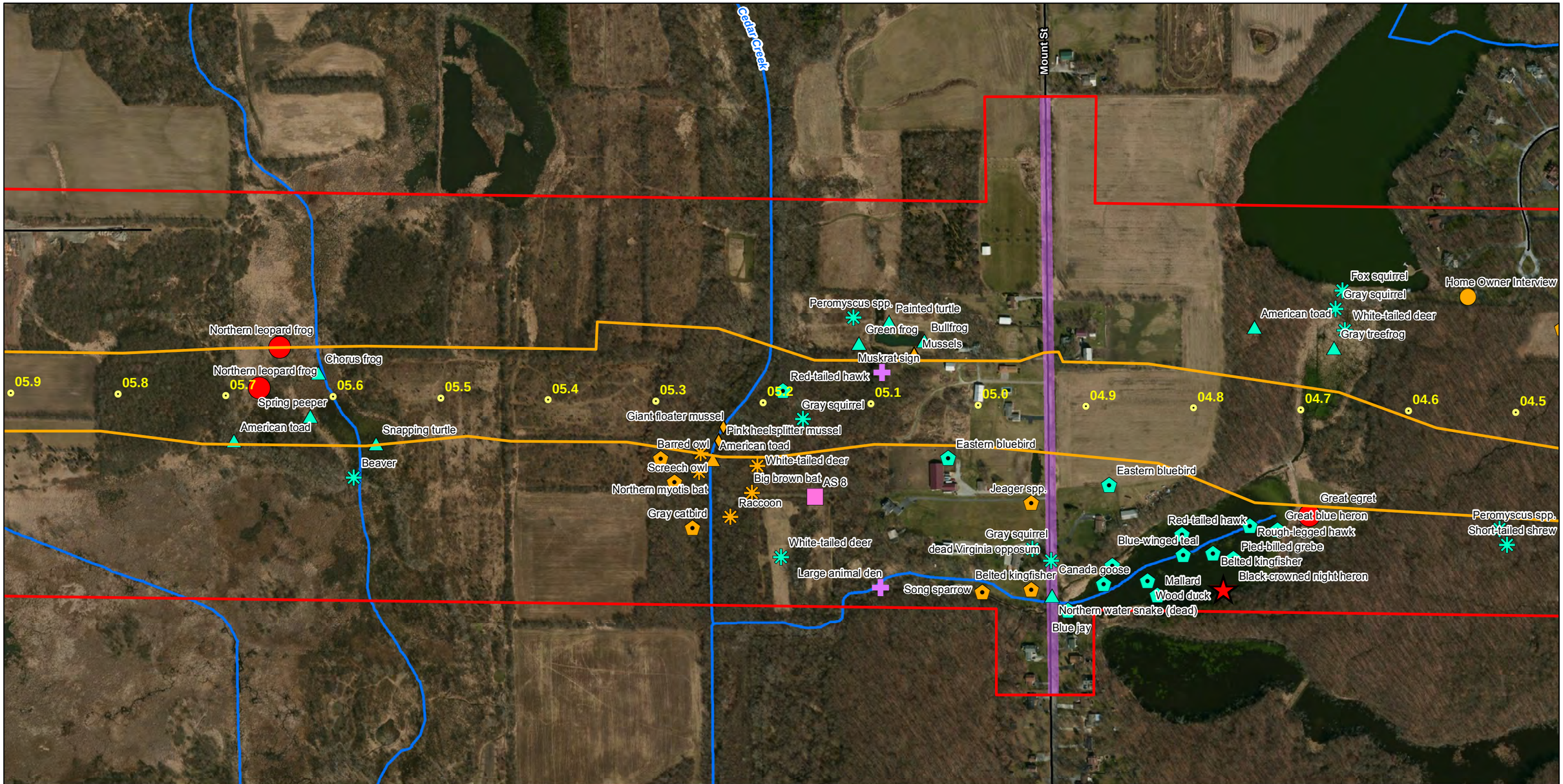
Incidental Mollusks
Home Owner Interview
Bird Windshield Survey
Habitat



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Township:33 N
Range: 8, 9 W
Project No: 1012012

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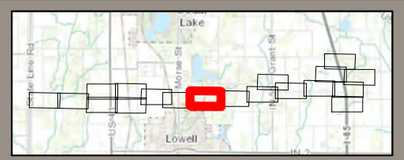

Appendix B -Wildlife Maps
Illiana Expressway
Parsons Brinkerhoff
Lake County, Indiana

0 400 800 1,600 Feet

Cardno JFNew
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Data Sources:

GIS Analyst: christine.dittmar

Propoed B3 June Footprint
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Species of Special Concern
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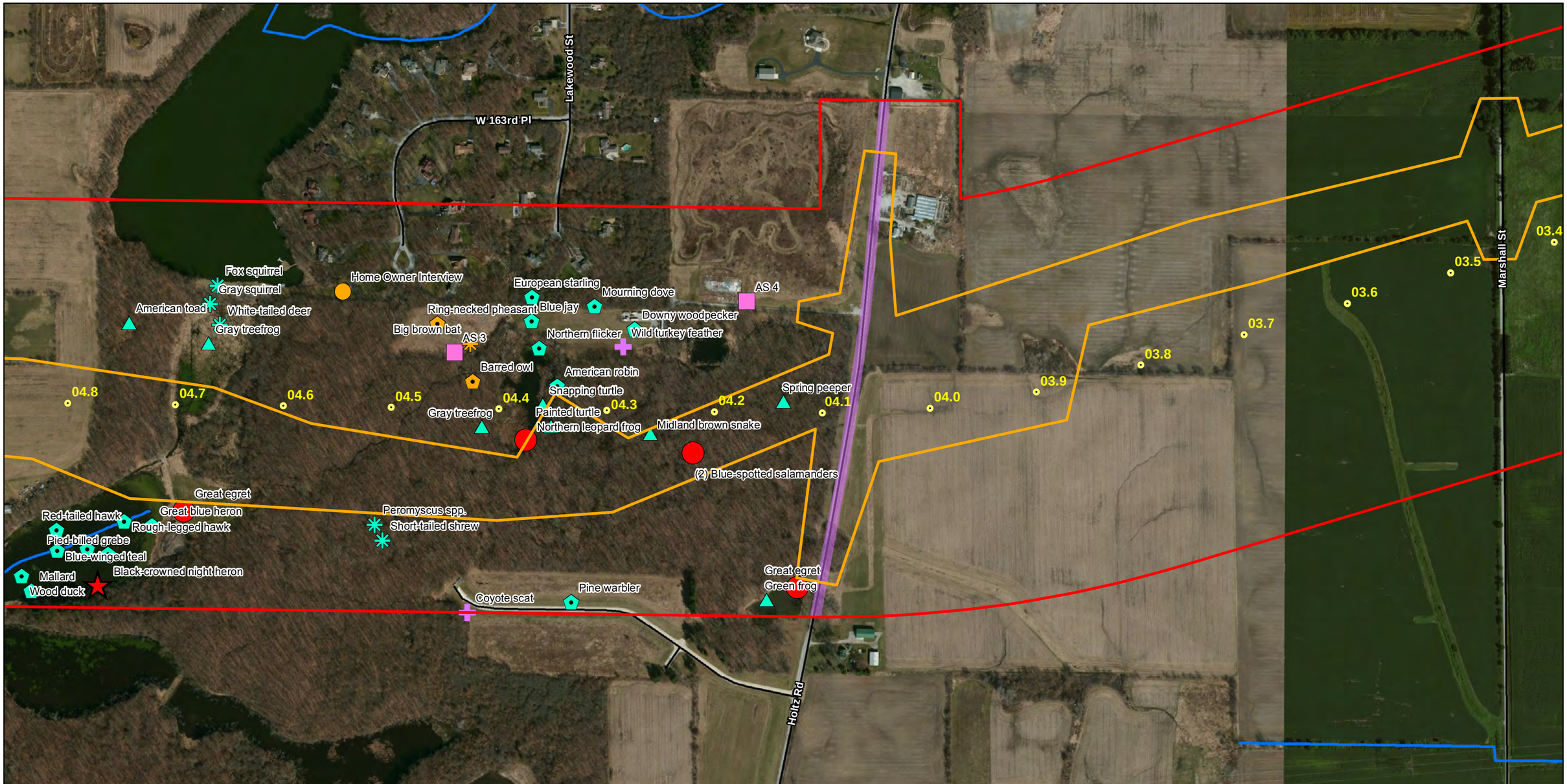

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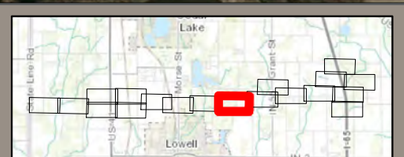

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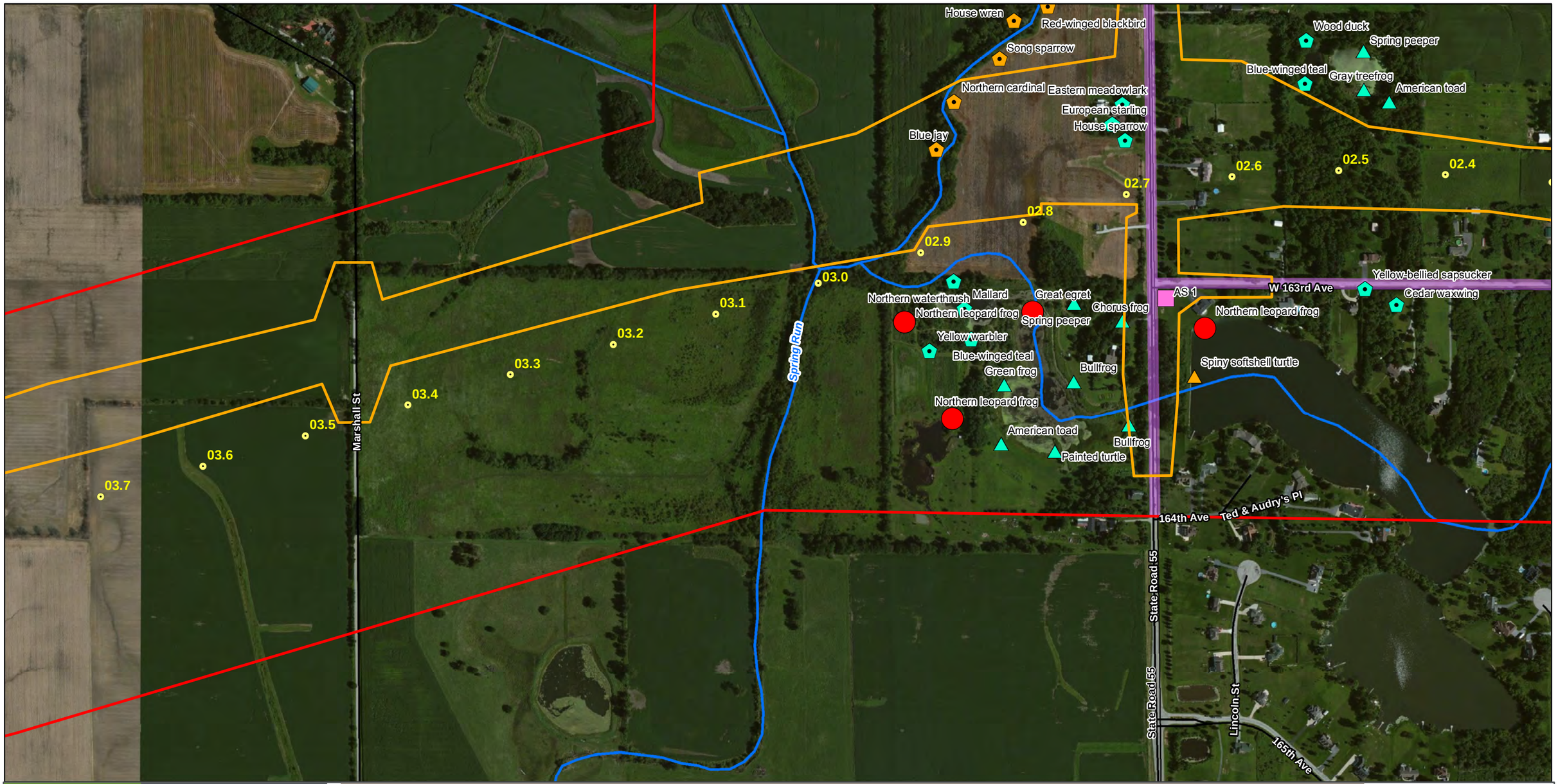

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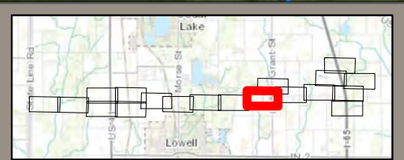

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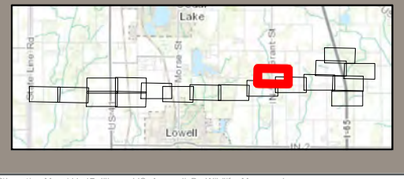

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Page 12 of 19

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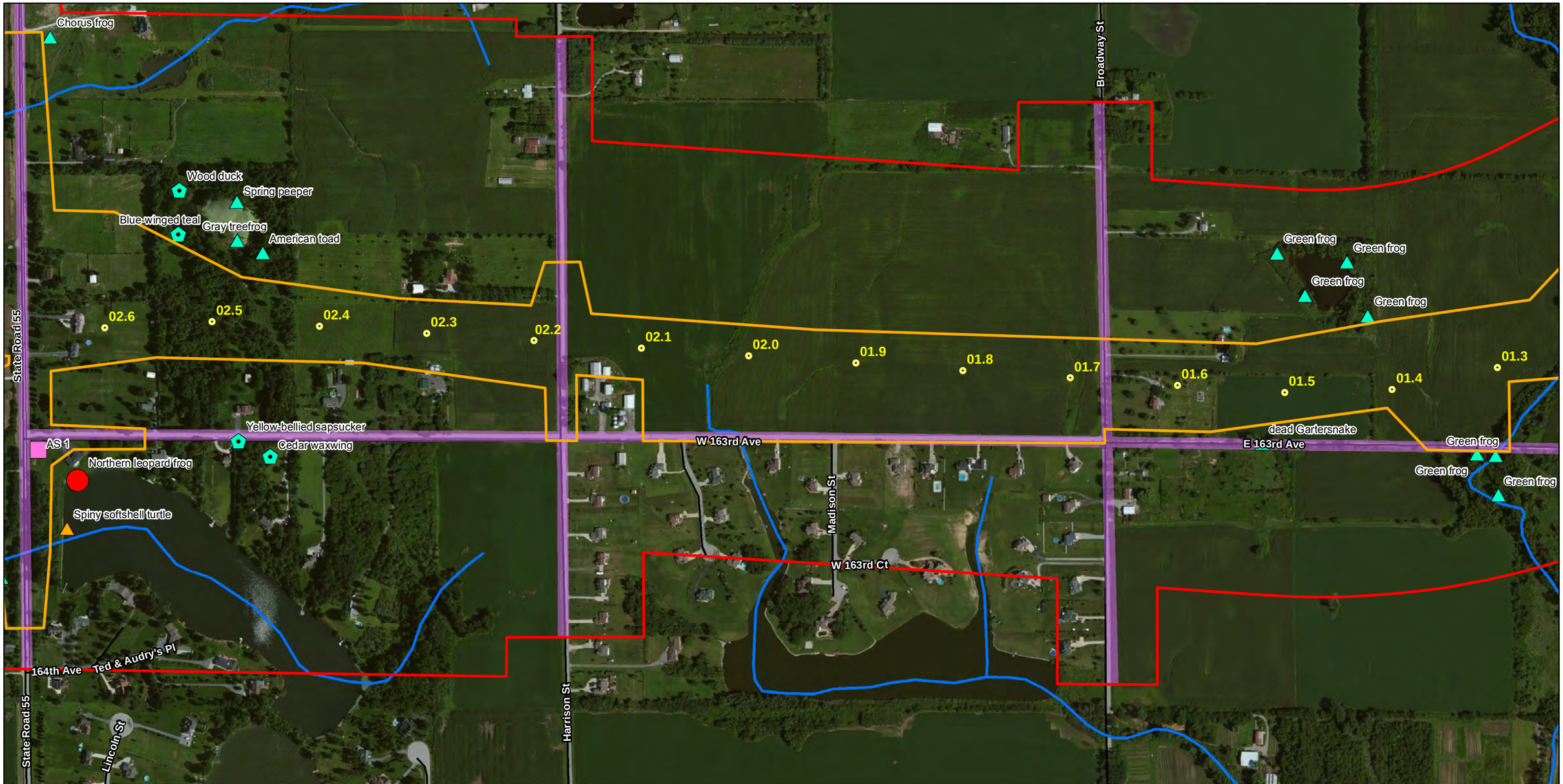

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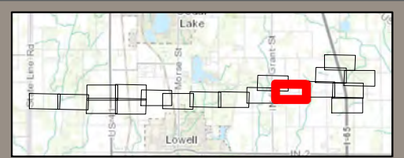

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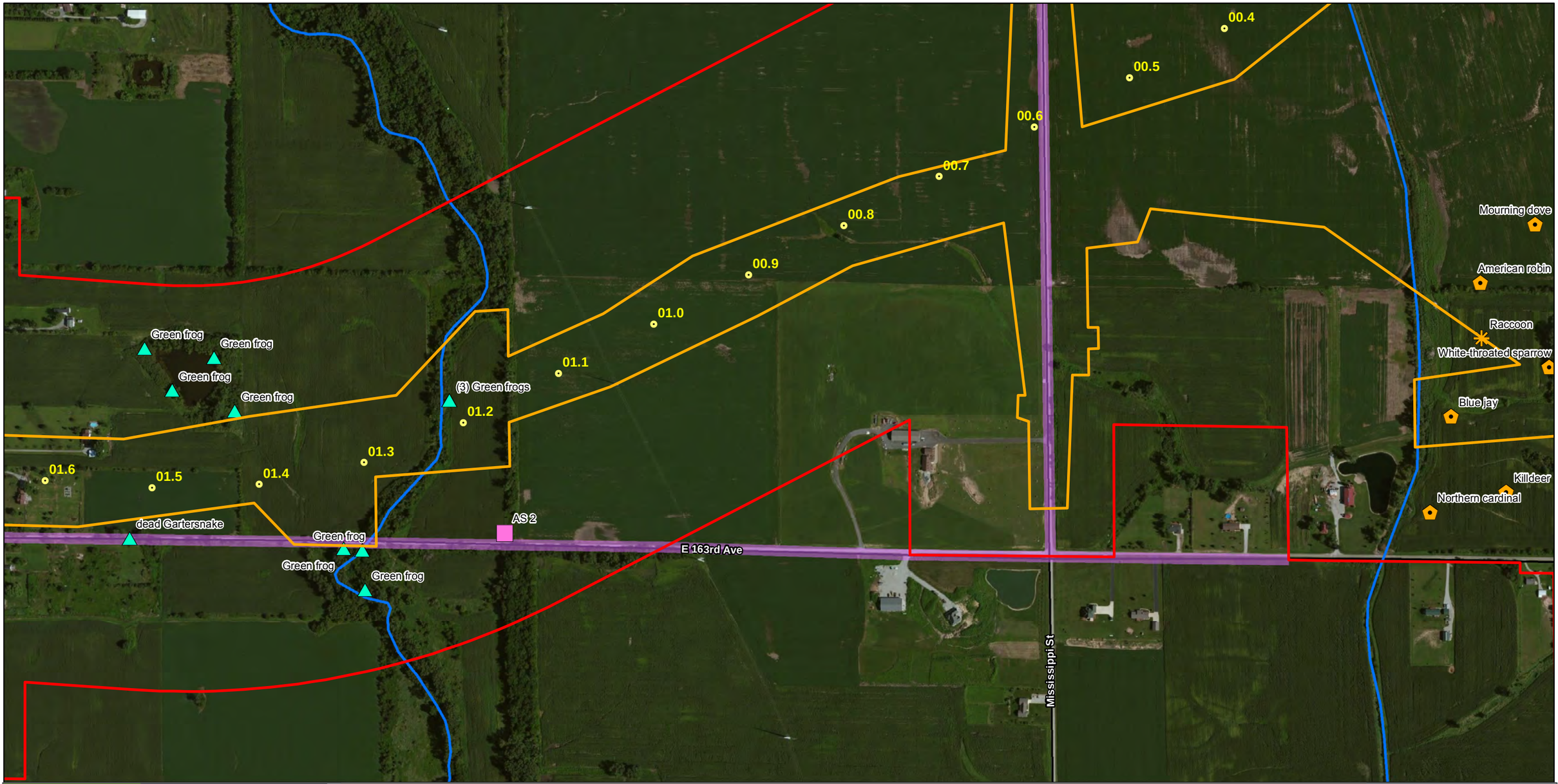

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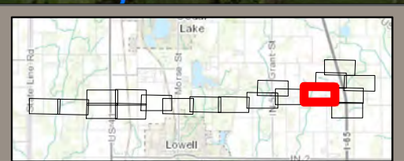

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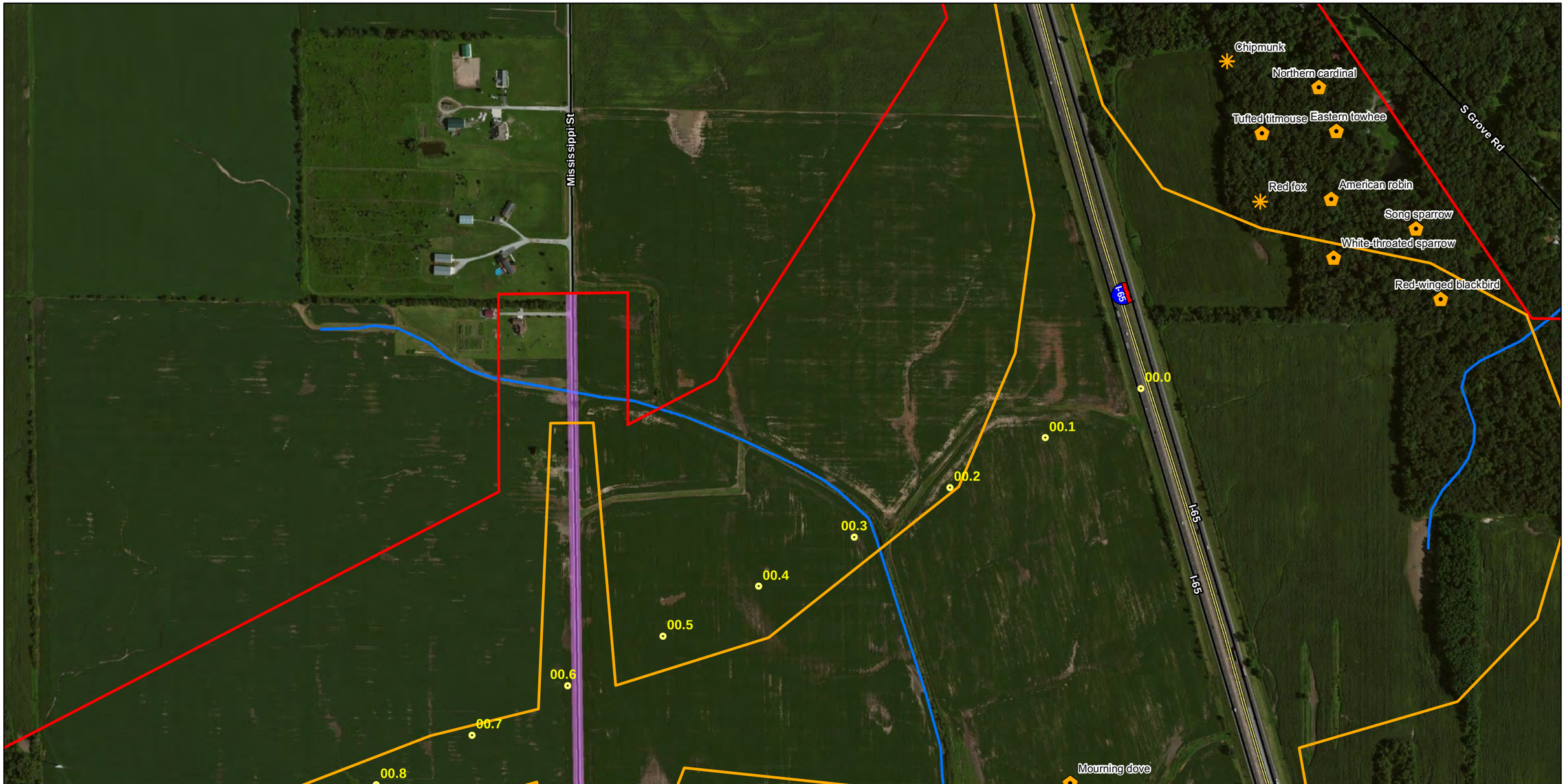

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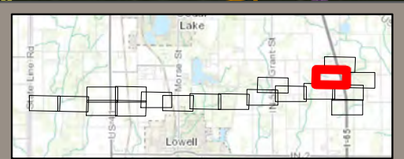

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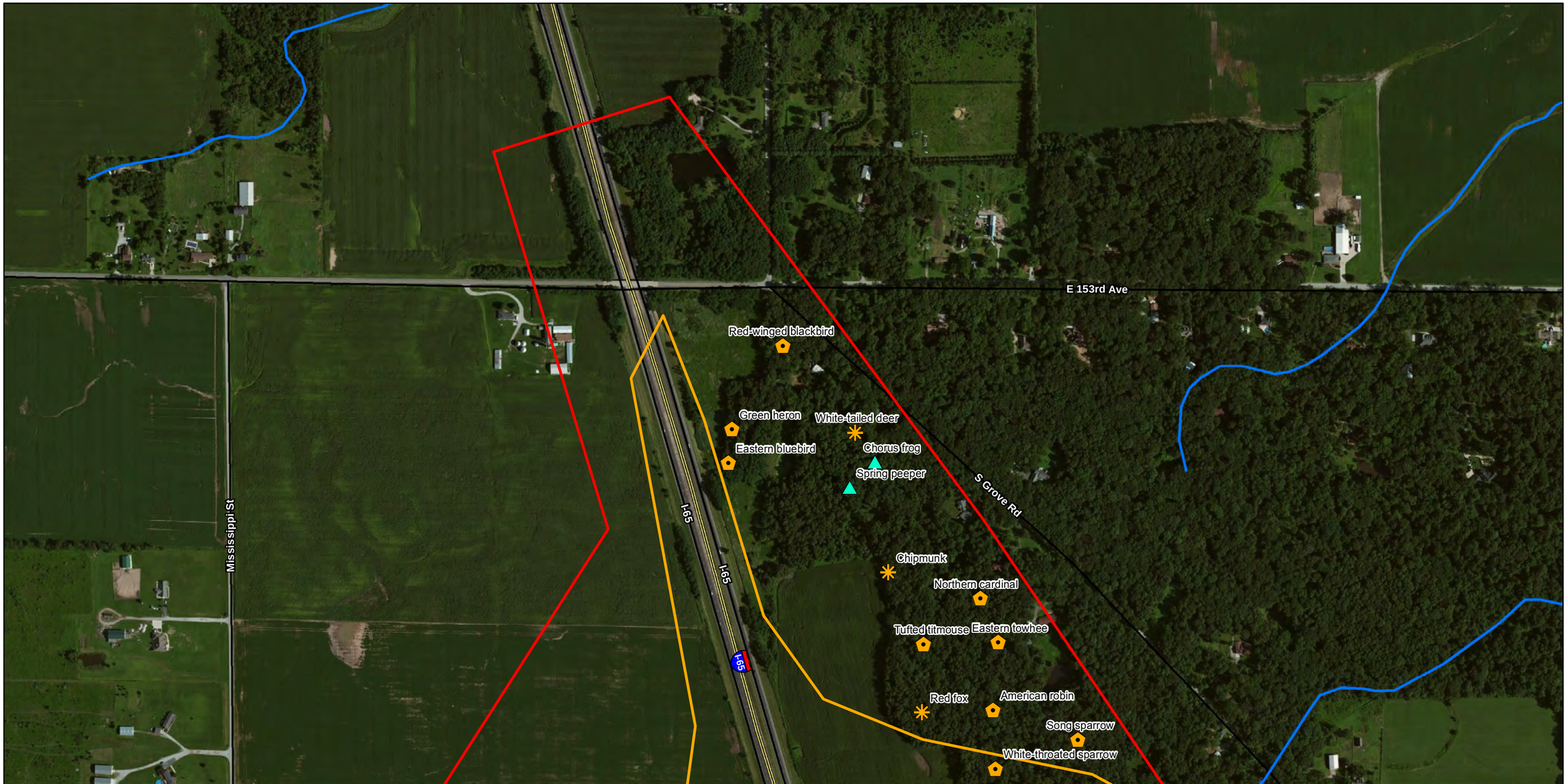

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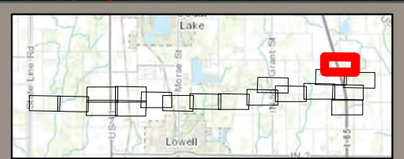

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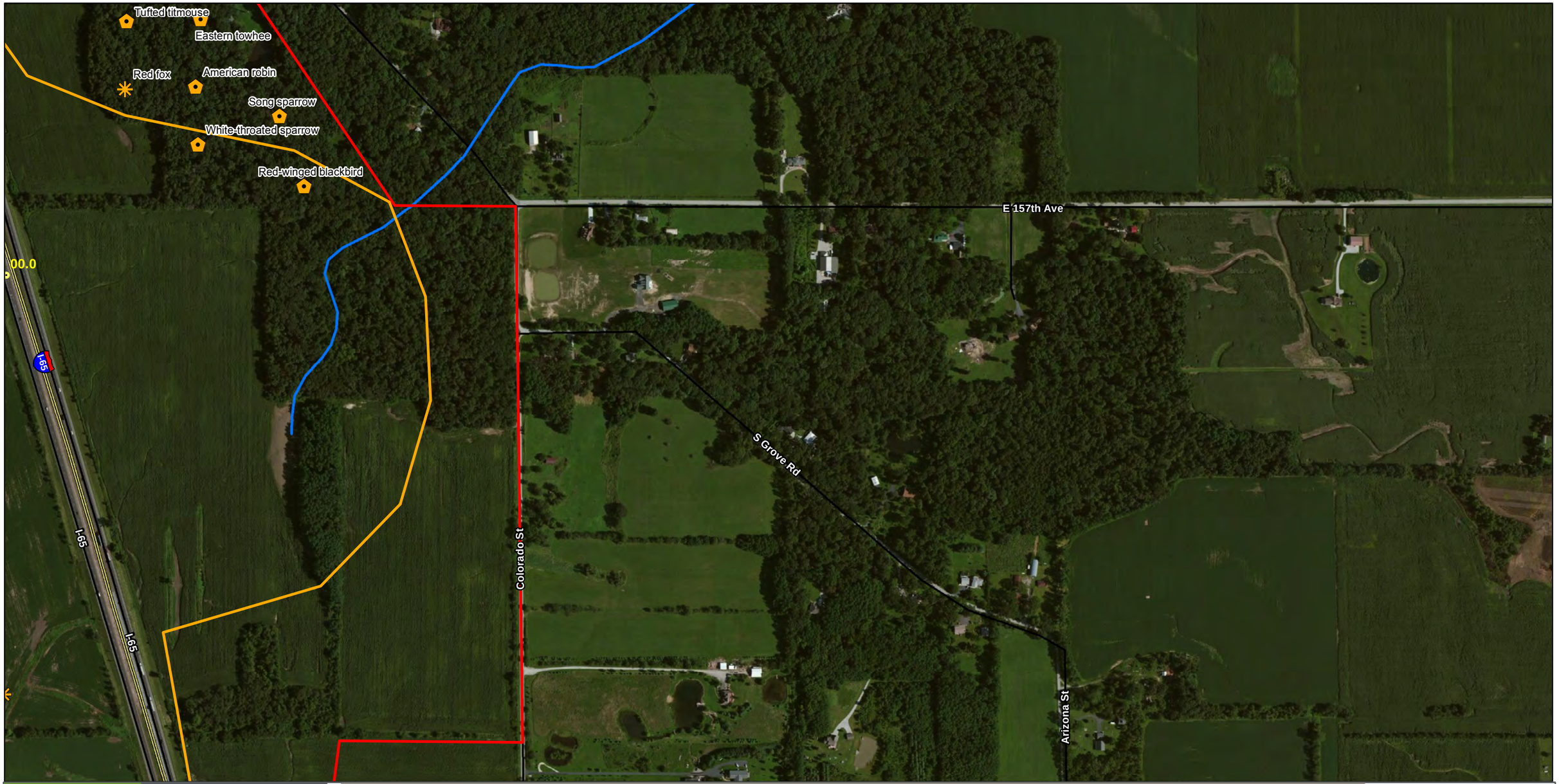

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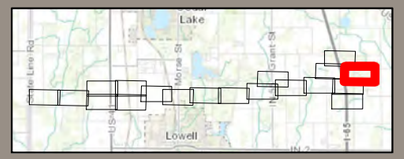

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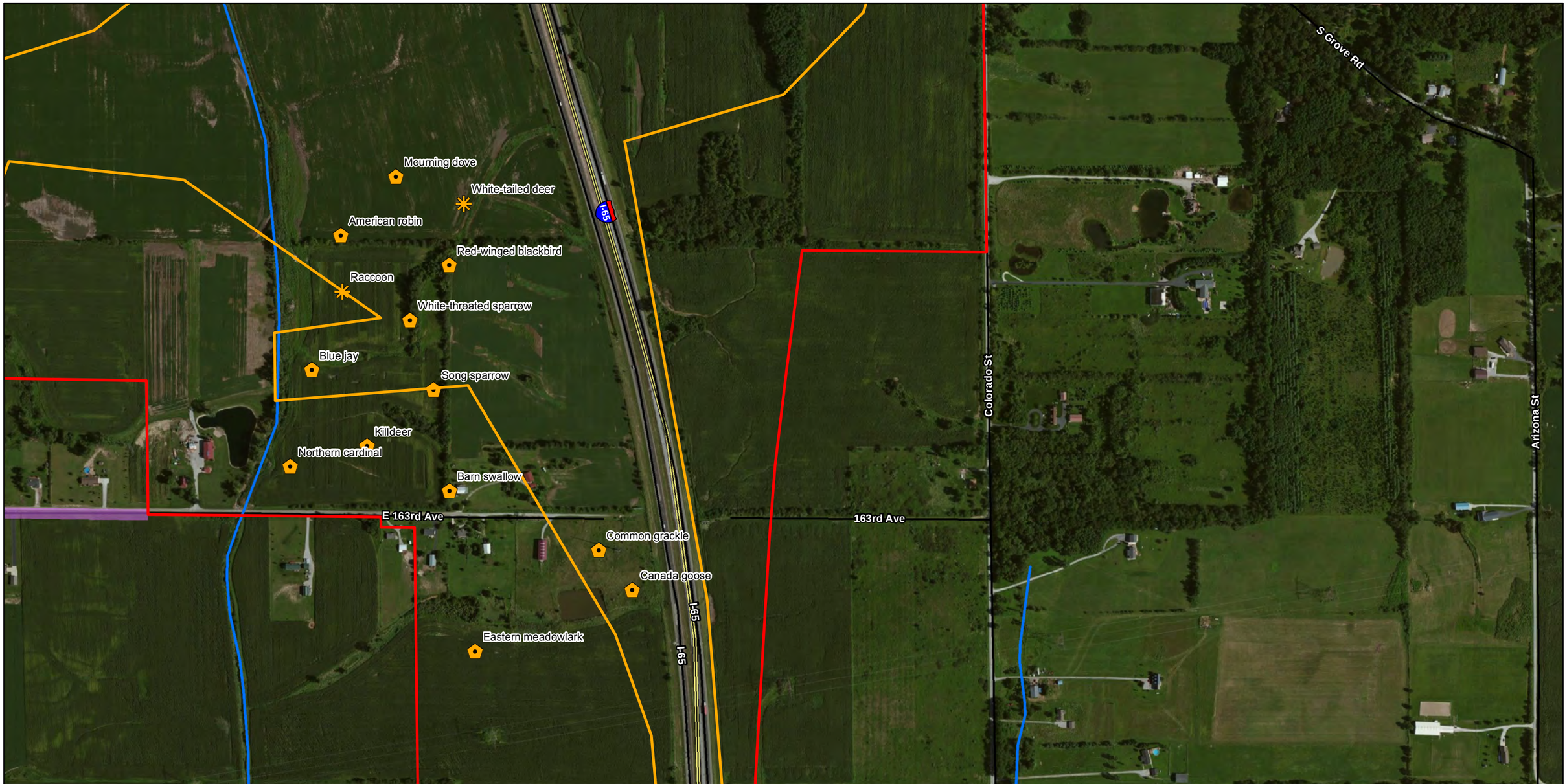

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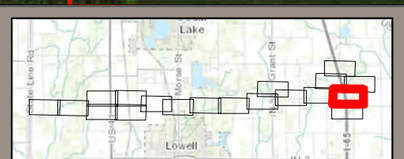

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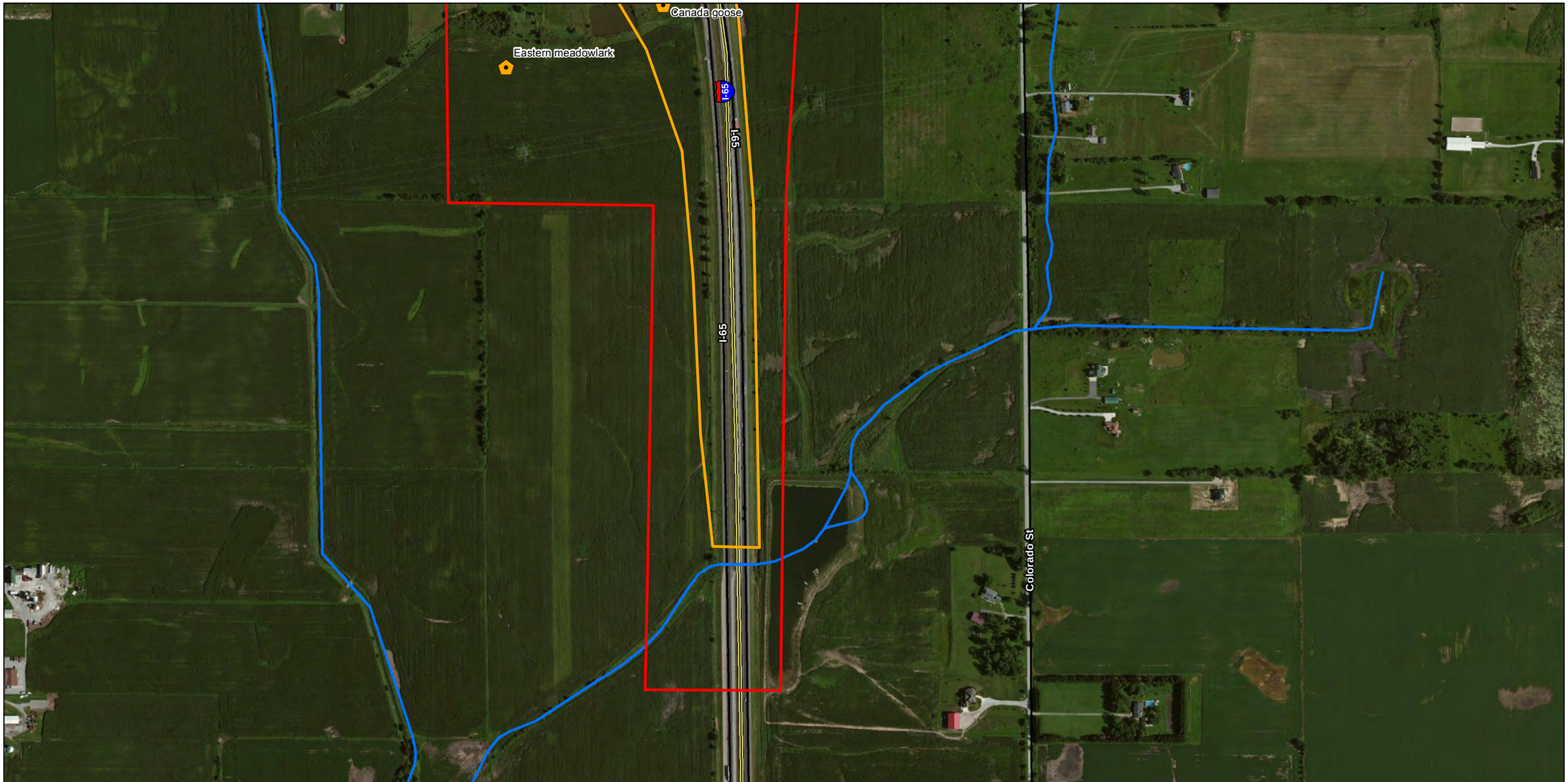

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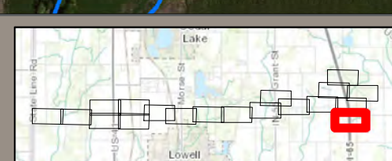

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chicago Ecological Services Field Office
1250 South Grove Avenue, Suite 103
Barrington, Illinois 60010
Phone: (847) 381-2253 Fax: (847) 381-2285

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ENGINEERING
PLANNING

IN REPLY REFER TO:
FWS/AES-CIFO

April 10, 2008

Eric Harm
Interim Engineer of Design & Environment
Illinois Department of Transportation
2300 South Dirksen Parkway - Room 330
Springfield, Illinois 62764

Angela LaPorte
Environmental Planner
Illinois State Toll Highway Authority
2700 Ogden Avenue
Downers Grove, Illinois 60515-1703

Dear Mr. Harm and Ms. LaPorte:

This responds to your letter dated March 5, 2008 describing an extensive 2 year effort to capture Indiana bats (*Myotis sodalis*) in northeastern Illinois and requesting "clearance" from section 7 responsibilities with respect to that species for all transportation projects for a period of 5 years. The study was funded by the Illinois State Toll Highway Authority (ISTHA) and the Illinois Department of Transportation (IDOT) in an effort to provide data on the potential presence of the Indiana bat.

We applaud IDOT and ISTHA for agreeing to conduct the 2 year "Blue Ribbon" study to determine if the Indiana bat is present in our coverage area. As you know, a lack of surveys and data documenting the presence or absence of the species in our area, in combination with the close proximity of a known maternity colony and existing hibernacula, resulted in our concern about possible adverse impacts to the species from various projects.

We concur that the study has provided evidence that the Indiana bat is not likely present in northeastern Illinois. We recommend that you use this study to support the conclusion that specific transportation projects are not likely to adversely affect the Indiana bat. We would then concur with these individual conclusions. We agree to continue with this procedure for a period of 5 years, through the summer of 2012.

As noted in your letter the only exception would be in areas that we deem to be "exceptional sites." Furthermore if new information becomes available indicating that the Indiana bat may be present in northeastern Illinois, then as a group we would reevaluate survey needs.

Again, we commend both agencies in their cooperation in this significant endeavor. Information obtained in the 2 year study is paramount for our knowledge of the species in our area. We look forward to working with both agencies on this issue and future endeavors involving the Service's trust resources.

This letter provides comment under the authority of, and in accordance with, the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.)* and the Endangered Species Act of 1973, as amended (87 Stat. 884. as amended; 16 U.S.C. 1531 *et seq.*).

If you have any questions, please contact Mr. Shawn Cirton at 847/381-2253, ext. 19.

Sincerely,

John D. Rogner
Field Supervisor

cc: IDOT, Brooks, Dees
ISTHA, Zucchero
IDNR, Hamer, Kath
COE, Isoe, Abrant, Chernich
RIFO, Nelson, Millar
BIFO, Pruitt, Pruitt, King

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IN REPLY REFER TO:
FWS/AES-CIFO

October 23, 2012

John Fortmann, P.E.
Acting Deputy Director of Highways
Illinois Department of Transportation
201 W. Center Court
Schaumburg, Illinois 60196-1096

Bryan Wagner
Environmental Planner
Illinois State Toll Highway Authority
2700 Ogden Avenue
Downers Grove, Illinois 60515-1703

Dear Mr. Fortmann and Mr. Wagner:

This letter serves as a confirmation of agreement between our staffs at the August 14, 2012, meeting; that existing data continue to indicate that the Indiana bat (*Myotis sodalis*) is not likely to be present in Northeastern Illinois, or if present occurs only in very low numbers.

Our previous letter of April 10, 2008, also concluded that the Indiana bat was not likely present in Northeastern Illinois based on the results of an extensive two year effort to capture Indiana bats in Northeastern Illinois. The two year study was funded by the Illinois State Toll Highway Authority (ISTHA) and the Illinois Department of Transportation (IDOT) in an effort to provide data on the potential presence of the Indiana bat.

The two year "Blue Ribbon" study was conducted due to a lack of surveys and data documenting the presence or absence of the species in our area, in combination with the close proximity of a known maternity colony and existing hibernacula. Based on the study results, we agreed that the study provided evidence that the Indiana bat is not likely present in Northeastern Illinois, or if present occurs in very low numbers. We recommended that both IDOT and ISTHA use the study to support the conclusion that specific transportation projects were not likely to adversely affect the Indiana bat. The only exceptions for this determination were in areas that we deemed to be "exceptional sites" (e.g., large wooded areas or large riparian corridors that possessed suitable habitat for the species or had a high ecological value).

In the five years since our original letter there have not been any verified records of Indiana bats in Northeastern Illinois. Therefore, we continue to support our prior recommendation until new information becomes available indicating that the Indiana bat may be present in Northeastern Illinois. Additionally, during recent meetings with IDOT and ISTHA, we made your staff aware of the possibility that new bat species may be added to the list of threatened and endangered species due to cumulative impacts from white-nose syndrome, wind turbines,

and other threats. The U.S. Fish and Wildlife Service was petitioned to review the conservation status of the northern long-eared bat (*Myotis septentrionalis*) and the eastern small-footed bat (*Myotis leibii*) and to make a determination of whether listing these species as threatened or endangered is warranted under the Endangered Species Act (ESA). The northern long-eared bat is known to occur in Northeastern Illinois based on the results of the "Blue Ribbon" study and other bat studies in our area. A 90 day finding on the petition to list the northern long-eared bat and the eastern small-footed bat as endangered or threatened under the ESA was recently published in the Federal Register. We found that the petition presented substantial scientific or commercial information indicating that listing of the two species may be warranted, and we initiated a review of the status of these species. Based on the status review, we will issue a 12 month finding on the petition, which will address whether the petitioned action is warranted, as provided in the ESA. Our office will keep you informed of the review process and coordinate appropriately based on the results.

This letter provides comment under the authority of, and in accordance with, the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.)* and the Endangered Species Act of 1973, as amended (87 Stat. 884. as amended; 16 U.S.C. 1531 *et seq.*).

If you have any questions, please contact Mr. Shawn Cirton at 847/381-2253, ext. 19.

Sincerely,

Louise Clemency

Louise Clemency
Field Supervisor

cc: IDOT, Harmet, Brooks
ISTHA, Zucchero
IDNR, Hamer, Kath
COE, Beal, Chernich, Wozniak
RIFO, Nelson, Lundh
BIFO, Pruitt, Pruitt, King

A LIMITED ASSESSMENT OF ENDANGERED AND THREATENED INSECTS ASSOCIATED WITH THE IDOT ILLIANA EXPRESSWAY PROJECT CORRIDOR IN WILL COUNTY, ILLINOIS

Report prepared by
Christopher H. Dietrich
Illinois Natural History Survey

For

Illinois Department of Transportation
Bureau of Design and Environment
2300 South Dirksen Parkway
Springfield, IL 62764

IDOT Job No.: P-91-749-10 (Seq. Nos.: 16651A and 16651B)

INHS Job No.: FS-567

INHS/IDOT STATEWIDE BIOLOGICAL SURVEY & ASSESSMENT PROGRAM REPORT 2013(13)

April 2013

Prairie Research Institute, University of Illinois at Urbana Champaign
William Shilts, Executive Director
Illinois Natural History Survey
Brian D. Anderson, Director
1816 South Oak Street
Champaign, IL 61820
217-333-683

INTRODUCTION

This report is submitted in response to a Further Studies Transmittal (IDOT Job No.: P-91-749 10, Sequence No.: 16651A) from Susan Hargrove (Illinois Department of Transportation, Springfield – IDOT) to Joe Merritt (Illinois Natural History Survey, Champaign – INHS), dated 20 March 2012, requesting surveys for endangered and threatened insects (Arthropoda, Insecta) be conducted in areas associated with / crossed by the proposed Illiana Expressway Project Corridor in Will, Kankakee, Grundy, and Kendall counties in Illinois.

On March 8, 2013, we were tasked with an addendum for this project – as Addendum B, Sequence 16651B. We overlaid the expanded areas delineated in Sequence 16651B on the map with the project corridor delineated in the previously tasked Sequence 16651A, but no new sites were identified in the Addendum B areas that would require additional surveys. This report covers the areas delineated in Sequence 16651A and in Addendum B, Sequence 16651B.

Botanical surveys conducted by Michael Murphy, INHS (Murphy 2013 and personal communication), indicated the presence of plant species in the IDOT Illiana Expressway project corridor that serve as hosts for three terrestrial insect species listed as Threatened or Endangered in Illinois (Illinois Endangered Species Protection Board [IESPB] 2011). Therefore, surveys for terrestrial insects were conducted, but restricted to those areas in the project corridor where significant stands of the insect host plants were present. The targeted insects include the leafhopper (Hemiptera: Cicadellidae) species *Aflexia rubranura* (DeLong) and *Athysanella incongrua* Baker, and the Eryngium Stem Borer (also called Eryngium Root Borer or Rattlesnake Master Borer) moth (Lepidoptera: Noctuidae) *Papaipema eryngii* (Bird).

Aflexia rubranura, the Red-Tailed Prairie Leafhopper, is a specialist on Prairie Dropseed (*Sporobolus heterolepis*). This species is endemic to the Great Lakes area. Although northern Illinois is at the southern extreme of its range, it is home to some of the largest known populations of the species (Hamilton 1999). This species is rare throughout most of its range and occurs only in large, mature stands of its host grass. In Illinois it is recorded from only a few sites in Cook, Will, DuPage, and Lake Counties where Prairie Dropseed is abundant (Hamilton 1999, and unpublished data). Its status in Illinois is currently listed as Threatened (IESPB 2011). This species was considered likely to occur within the IDOT Illiana Expressway project corridor given the proximity to known populations and the availability of its host plant.

Little information is available on the ecology of *Athysanella incongrua*, but this species is thought to feed on *Sporobolus asper* and, possibly, other *Sporobolus* species. It is rare throughout its range, which includes the northern Great Plains east to New Hampshire. In Illinois it was previously recorded from two hill prairies in Mason and Morgan Counties in the west-central part of the state, but the only extant population known at present is in Mason Co. (unpublished data). Its status in Illinois is currently listed as Endangered (IESPB 2011). Because of its rarity and known Illinois distribution this species was considered unlikely to occur within the IDOT Illiana Expressway project corridor although its probable host plant is relatively abundant within the study area.

The Eryngium Stem Borer moth is dependent on *Eryngium yuccifolium* (Rattlesnake Master) plants for its larval development and appears to occur only on sites that support large, mature stands of the host plant. Eggs are laid by females on or near the base of *Eryngium* plants in the fall where the eggs overwinter. In spring, the eggs hatch and the larvae bore into the stems of the host plant and tunnel their way down into the roots where they feed until mid-summer. The mature larvae then pupate and emerge as adults in late summer. The species is apparently a Tallgrass Prairie endemic and is recorded from Arkansas, Illinois, Kentucky, and Oklahoma (U.S. Forest Service 2003). In Illinois the species is listed as Endangered (IESPB 2011).

STUDY AREA

For a full description of the study area, please refer to the botanical survey report submitted by Michael Murphy (Murphy 2013). Because the targeted insect species are phytophagous (plant feeding) and confined to sites where significant stands of their host plants occur, surveys for insects within the project corridor were confined to those sites indicated by the prior botanical survey (Murphy 2013) to harbor one or more of the host plant species utilized by the insects. These sites are highlighted with pale green in the maps shown in **Figure 1**.

METHODS

Surveys for terrestrial insects were conducted during summer 2012 on sites where significant stands of the host plants of targeted insect species were shown to be present by botanical surveys earlier in the growing season (Murphy 2013 and personal communication). Leafhoppers were sampled by sweeping vegetation near ground level with a canvas sweep net and by using a gasoline-powered vacuum. Presence of stem-borer moths was detected by checking the stems of Rattlesnake Master plants for the characteristic bore holes exuding frass (excrement) produced by larvae feeding within the stems and roots. Field sampling was conducted on June 7 and again on August 23, 2012. Because the targeted species are rare, occur in very small populations, are easily identified in the field, and are listed as endangered or threatened, voucher specimens were not collected. Nomenclature for insects discussed in this report follows Oman (1949) and Beccaloni et al. (2003). The current status of threatened and endangered species of insects discussed in this report are taken from Illinois Endangered Species Protection Board (IESPB) (2011), and Mankowski (2010, 2012).

RESULTS AND DISCUSSION

Locations of sites where a state listed insect species was found are indicated by pink dots in **Figure 1**. Also refer to maps included in the separate botanical survey report by INHS botanist Michael Murphy (Murphy 2013).

Aflexia rubranura. Only one significant stand of *Sporobolus heterolepis* was found within the corridor, at Murphy's Area A - Prairie Site #1 (Murphy 2013). No *Aflexia rubranura* were detected in this area and the species is therefore presumed to be absent. The stand of Prairie Dropseed present here is much smaller than those known to support other populations of the leafhopper in northern Illinois. Because no other significant stands of Prairie Dropseed were found in the study area, *Aflexia rubranura* appears to be absent in the IDOT Illiana Expressway project corridor.

Athysanella incongrua. Stands of *Sporobolus asper* in or closely adjacent to Murphy's Prairie Sites #2, 3, 4, and 8 (Murphy 2013) were sampled by vacuum and sweep net but yielded no specimens of this species. Another site containing large stands of *S. asper* along an abandoned railroad southeast of Beecher (42.31739°N, 087.60870°W) was sampled on August 23, 2012 but also yielded no *A. incongrua*. This is not surprising, given that the species has never been recorded from northeastern Illinois. This species therefore also appears to be absent in the IDOT Illiana Expressway project corridor.

Papaipema eryngii. Large stands of the host plant of Eryngium Stem Borer Moth, *Eryngium yuccifolium*, were present in Murphy's Prairie Sites #1–4 and #17. Searches of individual plant stems were conducted at each of these sites and small populations (number of individuals given in parentheses) of the moth were located at sites #1 (1 individual), #3 (3 individuals), and #17 (3 individuals).

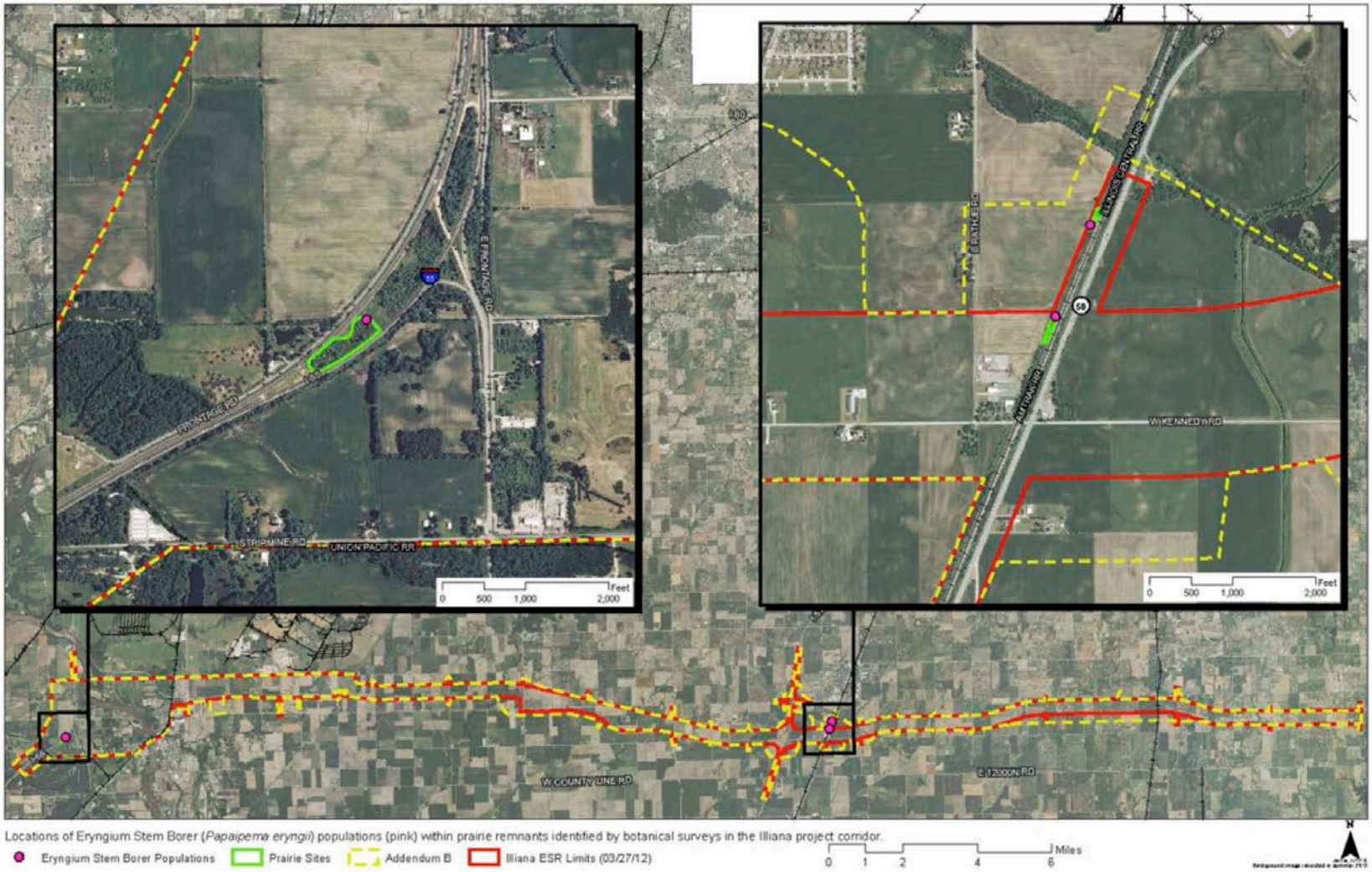

Figure 1. Map of study area within/adjacent to the IDOT Illiana Expressway project corridor in Will County, Illinois. Insets on this map are enlargements of the delineated areas (encompassed by the red / yellow dashed outline) along the project alignment at bottom of this map. Prairie remnants with stands of Rattlesnake Master (*Eryngium yuccifolium*) are highlighted in pale green and locations of Eryngium Stem Borer (*Papaipema eryngii*) populations are indicated by pink dots. Map generated by J. Jarvis, INHS.

Of the three state-listed insect species that might be predicted to occur in the study area based on the presence of their host plants, only one, *Papaipema eryngii*, was detected. Where they occur, populations of this species are dependent on the large, mature stands of Rattlesnake Master that provide their larval food plants. Such stands are present in the areas where larvae of the moth were detected. Although the populations of *P. eryngii* detected in the study area appear to be small, they may represent segments of larger populations of this species previously reported to occur in nearby protected areas including Des Plaines State Wildlife Area and Midewin National Tallgrass Prairie and others (Panzer 1998). However, because *P. eryngii* is thought to be a poor disperser and is sensitive to fire, the stands of *E. yuccifolium* located in the IDOT Illiana Expressway project corridor probably represent important refuge areas for the moth, given that the mentioned conservation areas are managed with frequent prescribed burning. Recent studies of prairie insects in Illinois (reviewed by Dietrich 2009) have shown that the small patches of native prairie vegetation present in highway and railroad rights-of-way are crucial to the survival of many terrestrial insect species that are dependent on prairie plants as hosts because the vast majority of their original habitat has been destroyed by agriculture and urbanization. The prairie sites in the IDOT Illiana Expressway project corridor mentioned above are no exception.

ACKNOWLEDGEMENTS

Michael Murphy, INHS botanist, kindly provided data on populations of host plants for the targeted insect species and assisted with the preparation of this report. Maps were provided by Janet L. Jarvis (INHS Remote Sensing and GIS specialist).

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Appendix O - Pollutant Loading Analysis Summary

Stream[1]	Drainage Crossing[2]	General Use Water Quality Standard[3]			Alternative 1[4]								Alternative 2[4]								Alternative 3[4]							
					Without Post-Construction Stormwater BMPs[5]				With Implementation of Post-Construction Stormwater BMPs				Without Post-Construction Stormwater BMPs[5]				With Implementation of Post-Construction Stormwater BMPs				Without Post-Construction Stormwater BMPs[5]				With Implementation of Post-Construction Stormwater BMPs			
		Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)
ILLINOIS (FHWA METHOD)																												
UNT to Kankakee River[6]	1, 2, 3	0.064	0.337	0.394	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.069	0.129	0.423	456	0.007	0.008	0.031	16
Kankakee River	4	0.051	0.264	0.323	0.001	0.003	0.001	3	0.000	0.000	0.000	0.02	0.000	0.001	0.002	3	0.000	0.000	0.000	0.02	0.000	0.001	0.002	3	0.000	0.000	0.000	0.02
UNT to Kankakee River	5	0.064	0.337	0.394	0.066 - 0.072	0.122 - 0.134	0.403 - 0.439	434 - 474	0.007 - 0.008	0.008 - 0.009	0.030 - 0.033	15 - 16	0.066 - 0.072	0.122 - 0.134	0.403 - 0.439	434 - 474	0.007 - 0.008	0.008 - 0.009	0.030 - 0.033	15 - 16	0.066 - 0.072	0.122 - 0.134	0.403 - 0.439	434 - 474	0.007 - 0.008	0.008 - 0.009	0.030 - 0.033	15 - 16
UNT to Forked Creek	6, 8	0.062	0.324	0.382	0.030 - 0.033	0.027 - 0.030	0.108 - 0.119	139 - 152	0.009 - 0.010	0.003	0.015 - 0.016	5	0.030 - 0.033	0.027 - 0.030	0.108 - 0.119	139 - 152	0.009 - 0.010	0.003	0.015 - 0.016	5	0.030 - 0.033	0.027 - 0.030	0.108 - 0.119	139 - 152	0.009 - 0.010	0.003	0.015 - 0.016	5
UNT to Forked Creek	9	0.042	0.212	0.270	0.024	0.022	0.089	114	0.013	0.007	0.033	19	0.024	0.022	0.089	114	0.013	0.007	0.033	19	0.024	0.022	0.089	114	0.013	0.007	0.033	19
Jordan Creek and tributaries	13A-C, 11, 14	0.034	0.165	0.220	0.022 - 0.023	0.020 - 0.021	0.080 - 0.082	103 - 105	0.007	0.002	0.011	4	0.022 - 0.023	0.020 - 0.021	0.080 - 0.082	103 - 105	0.007	0.002	0.011	4	0.022 - 0.023	0.020 - 0.021	0.080 - 0.082	103 - 105	0.007	0.002	0.011	4
West Branch Forked Creek	15	0.042	0.212	0.270	0.022	0.020	0.080	102	0.006	0.002	0.011	3	0.022	0.020	0.080	102	0.006	0.002	0.011	3	0.022	0.020	0.080	102	0.006	0.002	0.011	3
Forked Creek and tributaries	16-19, 19A	0.062	0.324	0.382	0.019	0.017	0.069	88	0.006	0.002	0.009	3	0.019	0.017	0.069	89	0.006	0.002	0.009	3	0.019	0.017	0.069	89	0.006	0.002	0.009	3
So Branch Forked Creek Tributary	20, 21	0.063	0.332	0.382	0.027	0.025	0.098	126	0.008	0.003	0.013	4	0.025	0.023	0.092	118	0.007	0.003	0.013	4	0.025	0.023	0.092	118	0.007	0.003	0.013	4
So Branch Forked Creek	24	0.051	0.262	0.320	0.017	0.015	0.062	79	0.005	0.002	0.008	3	0.018	0.017	0.067	86	0.010	0.006	0.025	17	0.018	0.017	0.067	86	0.010	0.006	0.025	17
Rock Creek and tributaries	25-27	0.081	0.433	0.486	0.035	0.032	0.126	162	0.010	0.003	0.017	6	0.038	0.035	0.140	179	0.011	0.004	0.019	6	0.038	0.035	0.140	179	0.011	0.004	0.019	6
Rock Creek and tributaries	28, 30	0.081	0.433	0.486	0.025	0.023	0.091	117	0.007	0.002	0.013	4	0.025	0.023	0.091	117	0.007	0.002	0.013	4	0.025	0.023	0.091	117	0.007	0.002	0.013	4
Black Walnut Creek	31	0.088	0.522	0.472	0.023	0.021	0.084	108	0.007	0.002	0.011	4	0.023	0.021	0.000	108	0.007	0.002	0.000	4	0.023	0.025	0.084	108	0.007	0.003	0.011	4
Marshall Slough	34	0.063	0.328	0.385	0.024	0.021	0.086	110	0.013	0.007	0.032	19	0.024	0.021	0.084	108	0.013	0.007	0.031	18	0.024	0.021	0.086	110	0.013	0.007	0.032	4
So Branch Rock Creek	35	0.081	0.434	0.487	0.026	0.023	0.093	119	0.007	0.003	0.013	4	0.026	0.023	0.093	119	0.007	0.003	0.013	4	0.026	0.023	0.093	119	0.007	0.003	0.013	4
Exline Slough and tributaries	36-38	0.081	0.434	0.487	0.024	0.022	0.089	113	0.007	0.002	0.012	4	0.024	0.022	0.088	112	0.007	0.002	0.012	4	0.024	0.022	0.089	113	0.007	0.002	0.012	4
Trim Creek and tributaries	41/42, 44, 44A	0.073	0.389	0.444	0.020	0.010	0.060	73	0.011	0.003	0.022	12	0.016	0.014	0.057	73	0.005	0.002	0.008	2	0.016	0.014	0.057	73	0.005	0.002	0.008	2
Pike Creek and tributaries	45, 45A, 46, 47	0.059	0.308	0.366	0.026	0.024	0.094	121	0.008	0.003	0.013	4	0.026	0.024	0.096	123	0.008	0.003	0.013	4	0.026	0.024	0.094	121	0.008	0.003	0.013	4
INDIANA (FHWA METHOD)																												
West Creek	48, 49, 50, 50A, 49A-2 through 49A-8	0.063	0.281	0.370	0.016	0.014	0.057	73	0.001	0.000	0.002	0.5	0.016	0.014	0.057	73	0.001	0.000	0.002	0.5	0.015	0.014	0.055	70	0.001	0.000	0.002	0.5
McConnell Ditch	58	0.052	0.230	0.315	0.027	0.025	0.098	126	0.002	0.001	0.003	1	0.027	0.025	0.098	126	0.002	0.001	0.003	1	0.027	0.025	0.098	126	0.002	0.001	0.003	1
Cedar Creek	60, 60A, 61	0.070	0.315	0.407	0.010	0.010	0.040	45	0.001	0.001	0.003	2	0.010	0.010	0.040	45	0.001	0.001	0.003	2	0.010	0.010	0.040	45	0.001	0.001	0.003	2
UNT to Spring Run	61C, 61D, 100, 101, 102	0.054	0.278	0.336	0.009	0.008	0.031	40	0.005	0.003	0.011	8	0.009	0.008	0.031	36	0.005	0.003	0.011	7	0.008	0.007	0.028	36	0.004	0.002	0.010	7
Spring Run and tributaries	62D, 63B, 64A, 64A-1 through	0.050	0.280	0.340	0.020	0.020	0.090	112	0.001	0.000	0.002	1	0.024	0.022	0.087	112	0.001	0.000	0.002	1	0.024	0.022	0.087	112	0.001	0.000	0.002	1

Stream[1]	Drainage Crossing[2]	General Use Water Quality Standard[3]			Alternative 1[4]								Alternative 2[4]								Alternative 3[4]							
					Without Post-Construction Stormwater BMPs[5]				With Implementation of Post-Construction Stormwater BMPs				Without Post-Construction Stormwater BMPs[5]				With Implementation of Post-Construction Stormwater BMPs				Without Post-Construction Stormwater BMPs[5]				With Implementation of Post-Construction Stormwater BMPs			
		Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	TSS (mg/L)
	64B-4, 64C-1, 64D-1, 64D-2, 64F, 64G, 64G-1, 103, 104																											
Bryant Ditch	68A-1, 69, 69A, 82, 83-87, 91-97, 97-1, 105, 106	0.049	0.216	0.298	0.058	0.053	0.211	271	0.017	0.006	0.029	9	0.054	0.049	0.196	252	0.016	0.005	0.027	9	0.054	0.049	0.196	252	0.016	0.005	0.027	9
ILLINOIS (USGS METHOD)																												
UNT to Kankakee River[6]	1, 2, 3	0.064	0.337	0.394	0.026	0.084	0.075	250	0.002	0.002	0.002	2	0.026	0.084	0.074	241	0.002	0.002	0.002	14	NA	NA	NA	NA	NA	NA	NA	NA
UNT to Kankakee River	1A	0.064	0.337	0.394	0.024	0.079	0.064	269	0.003	0.005	0.005	9	0.024	0.079	0.064	269	0.003	0.005	0.005	9	0.024	0.079	0.064	269	0.003	0.005	0.005	9
UNT to Kankakee River	1E	0.064	0.337	0.394	0.027	0.080	0.079	214	0.003	0.005	0.006	7	0.027	0.080	0.079	214	0.003	0.005	0.006	7	0.027	0.080	0.079	214	0.003	0.005	0.006	7
UNT to Jordan Creek	10, 13	0.034	0.165	0.220	0.028 - 0.031	0.070 - 0.085	0.083 - 0.093	212 - 256	0.008 - 0.009	0.008 - 0.009	0.011 - 0.013	7 - 9	0.028 - 0.031	0.070 - 0.085	0.083 - 0.093	212 - 256	0.008 - 0.009	0.008 - 0.009	0.011 - 0.013	7 - 9	0.028 - 0.031	0.070 - 0.085	0.083 - 0.093	212 - 256	0.008 - 0.009	0.008 - 0.009	0.011 - 0.013	7 - 9
UNT to Rock Creek	22, 22A, 23	0.081	0.433	0.486	0.022	0.055	0.054	323	0.012	0.018	0.020	65	0.022	0.056	0.055	333	0.012	0.018	0.020	57	0.022	0.056	0.055	333	0.012	0.018	0.020	57
UNT to Marshall Slough	33, 33A	0.063	0.328	0.385	0.025	0.069	0.063	411	0.007	0.008	0.009	14	0.024	0.065	0.062	390	0.007	0.007	0.008	13	0.024	0.065	0.062	390	0.007	0.007	0.008	13
UNT to Exline Slough	39/40	0.081	0.434	0.487	0.025	0.070	0.062	440	0.007	0.008	0.009	15	0.025	0.070	0.062	440	0.007	0.008	0.009	15	0.025	0.070	0.062	440	0.007	0.008	0.009	15
UNT to Exline Slough	40A	0.081	0.434	0.487	0.030	0.110	0.080	631	0.016	0.036	0.030	126	0.030	0.110	0.080	631	0.016	0.036	0.030	126	0.030	0.110	0.080	631	0.016	0.036	0.030	126
UNT to Trim Creek	40B	0.073	0.389	0.444	0.029	0.107	0.079	617	0.016	0.035	0.029	123	0.029	0.107	0.079	617	0.016	0.035	0.029	123	0.029	0.107	0.080	617	0.016	0.035	0.030	123
UNT to West Creek	48	0.063	0.329	0.387	0.026	0.077	0.066	459	0.008	0.008	0.009	16	0.026	0.077	0.066	459	0.008	0.008	0.009	16	0.026	0.077	0.066	459	0.008	0.008	0.009	16
INDIANA (USGS METHOD)																												
UNT to West Creek	52, 52A-1, 53A-5	0.063	0.329	0.387	0.034	0.094	0.110	247	0.010	0.010	0.015	8	0.034	0.094	0.110	247	0.010	0.010	0.015	8	0.034	0.094	0.110	247	0.010	0.010	0.015	8
UNT to Bruce Ditch	53A-2 through 53A-4, 53, 54, 55A-H	0.054	0.278	0.336	0.028	0.057	0.081	225	0.008	0.006	0.011	8	0.029	0.061	0.085	227	0.008	0.007	0.012	8	0.029	0.061	0.085	227	0.008	0.007	0.012	8
McConnell Ditch	56, 57A, 57A-1 through 57A-3, 57B, 57C	0.063	0.329	0.387	0.032	0.072	0.098	317	0.009	0.008	0.013	11	0.032	0.075	0.100	333	0.009	0.008	0.014	11	0.032	0.075	0.099	333	0.009	0.008	0.014	11
UNT to McConnell Ditch	59	0.054	0.278	0.336	0.026	0.074	0.071	339	0.002	0.002	0.002	2	0.026	0.074	0.071	339	0.002	0.002	0.002	2	0.026	0.074	0.071	339	0.002	0.002	0.002	2
UNT to Cedar Creek	60B	0.052	0.270	0.329	0.043	0.200	0.147	549	0.013	0.022	0.020	19	0.043	0.200	0.147	549	0.013	0.022	0.020	19	0.043	0.200	0.147	549	0.013	0.022	0.020	19
UNT to Cedar Creek	61A, 61A-2, 61B-2	0.052	0.270	0.329	0.044	0.189	0.155	451	0.024	0.062	0.057	90	0.041	0.106	0.140	337	0.002	0.002	0.004	2	0.041	0.106	0.140	337	0.002	0.002	0.004	2
Griesel Ditch and tributaries	65A, 65, 65A-1, 66A, 66B, 66, 67	0.070	0.369	0.425	0.025	0.058	0.066	244	0.001	0.001	0.002	2	0.026	0.072	0.071	250	0.001	0.002	0.002	2	0.025	0.072	0.067	268	0.001	0.002	0.002	2
UNT to Stony Run	88	0.058	0.300	0.358	0.043	0.113	0.151	318	0.023	0.037	0.056	54	0.043	0.113	0.151	318	0.023	0.037	0.056	54	0.043	0.113	0.151	318	0.023	0.037	0.056	54

Note: Bold/Underline text indicates an exceedance of General Use Water Quality Standards.

[1] UNT = Unnamed Tributary; NA = Not Applicable

[2] Drainage crossing(s) may vary per alternative (see Section 3.0 Map Set).

[3] Water Quality Standards for Illinois streams are provided from Illinois Administrative Code, unless otherwise noted. The dissolved metal acute and chronic standards are calculated from equations in 35 Ill. Adm. Code 302.208. Water Quality Standards for Indiana streams are provided from Indiana Administrative Code, Article 2, unless otherwise noted. The dissolved metal acute and chronic standards are calculated from equations in Section 327 IAC 2-1-6. There is no numeric water quality standard in Illinois or Indiana for TSS. Refer to the Illinois and/or Indiana Administrative Code for additional information.

[4] The range provided for the alternatives accounts for the range in impacts associated with the design options at IL-53.

[5] Acute pollutant concentration before stormwater enters a series of proposed BMPs (treatment train).

[6] The drainage area of the Unnamed Tributary to the Kankakee River at Drainage Crossings 1, 2, and 3 is less than 1 square mile for Alternatives 1 and 2, but greater than 1 square mile for Alternative 3. Therefore, the USGS Method (Driver and Tasker, 1990) was used for Alternatives 1 and 2 and the FHWA Method (Driscoll et al., 1990) was used for Alternative 3.