



**A LIMITED ASSESSMENT OF ENDANGERED AND THREATENED INSECTS
ASSOCIATED WITH THE IDOT ILLIANA EXPRESSWAY
PROJECT CORRIDOR IN WILL COUNTY, ILLINOIS**

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**INHS/IDOT STATEWIDE BIOLOGICAL SURVEY & ASSESSMENT
PROGRAM REPORT 2013(13)**

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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).

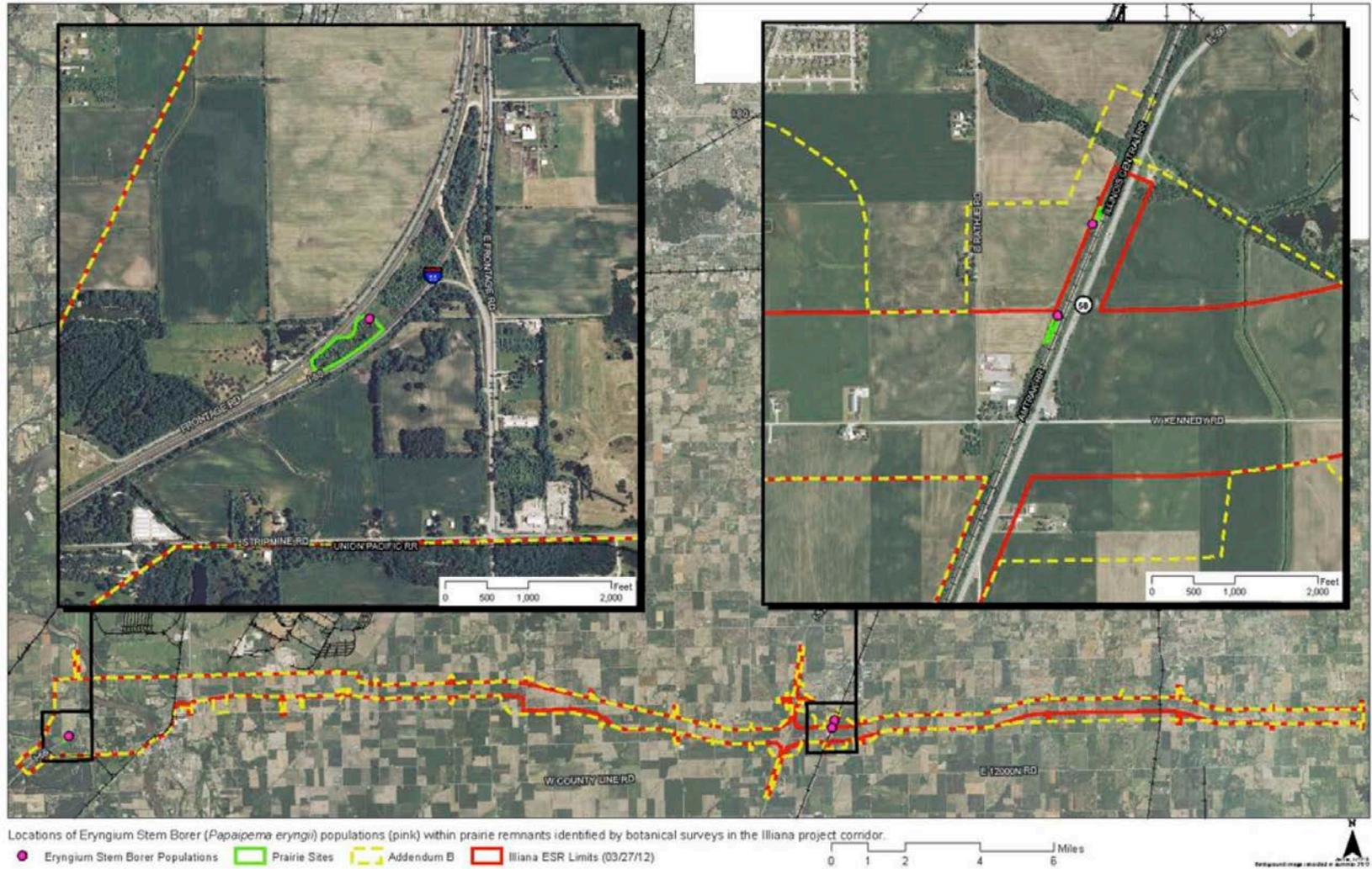


Figure 1. Map of study area within/adjacent to the IDOT Illiana Expressway project corridor in Will County, Illinois. Insets on this map are enlargements of the delineated areas (encompassed by the red / yellow dashed outline) along the project alignment at bottom of this map. Prairie remnants with stands 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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