Illinois Tollway

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January 25, 2008

Mr. Glen Kruse
Division of Natural Heritage
Illinois Department of Conservation
One Natural Resources Way
Springfield, Illinois 62702-1271

RE: Illinois State Toll Highway Authority
I-294 North Tri-State Tollway
Eastern Massasauga Rattlesnake – Incidental Take

Dear Mr. Kruse:

Please find the attached Incidental Take Submittal for the State-endangered Eastern Massasauga Rattlesnake (*Sistrurus catenatus*). The potential take of the species would be as a result of construction related activities for the installation of a bioswale along the North Tri-State Tollway (I-294) on land owned by the Forest Preserve District of Cook County.

As you know, the Illinois Tollway has had continuing coordination with the resource and regulatory agencies throughout the project development and permitting process. The Eastern Massasauga has been documented historically in the immediate vicinity of the proposed bioswale and more recently within two miles to the south and west of our site. Subsequently we are in need of an approval for an incidental take of the species.

The attached submittal, exhibits, and INHS reports document the history of the project, recent research and biological data for the species as well as past, present and future conservation measures. We are striving to achieve a balance between the long term bioswale success and continued existence of the species in Illinois, while still providing northern Illinois transportation needs.

If you have any questions or require additional information, please contact Angela LaPorte, Environmental Planner, at 630-241-6800, extension 3963.

Sincerely,

Paul Kovacs

Paul D. Kovacs, P.E.
Chief Engineer

cc: Brian Smith, CTE
John Rogner, USFWS
Ron Abrant, ACOE
Steve Hamer, IDNR

Incidental Take Submittal
For the State Endangered Species
Eastern Massasauga Rattlesnake (*Sistrurus catenatus*)

Conservation Plan

1) Description of the Impact

A) Introduction and Legal Description

The subject project is to reconstruct and widen an approximate 36-mile segment of Interstate 94/294 (Tri-State Tollway) between Balmoral Avenue (Milepost 39.5) and the Wisconsin State Line (Mile Post 78). The Illinois Tollway developed a comprehensive, long-range plan for modernizing and rebuilding the 50-year old, 274-mile Tollway to create a more efficient transportation system for commuters throughout the Chicago Metropolitan Area. More than 1.3 million vehicles travel on the Illinois Tollway each day and 44% of those vehicles travel along the Tri-State Tollway daily. The proposed improvements will greatly improve congestion for commuters and business in Cook County, Lake County and Northeast Illinois.

The purpose of this proposed project is to 1) reconstruct the nearly fifty-year old roadway to eliminate increasing maintenance and rehabilitation costs including the traffic delays associated with them, 2) increase capacity to an acceptable level of service, and 3) provide a safe and efficient travel way for Tollway patrons.

The primary interest location of the Eastern Massasauga Rattlesnake is in northern Cook County, on property owned by the Forest Preserve District of Cook County (FPDCC). The legal description of the primary disturbance areas are Sec 1 and 12 of R11E, T42N and Sec18, R12E, T42N. (See Figures in Attached INHS and FPDCC Reports).

B) Biological Data on the Species

Eastern Massasauga Rattlesnake (*Sistrurus catenatus*) was listed as a State Endangered Species by the Illinois Department of Natural Resources in 1994. Historically, the Eastern Massasauga occurred in the northern two-thirds of the state, excluding the northwestern unglaciated region (Kuhns et al., 2006). The preferred habitat is wet prairies, bogs, marshlands, old fields, and floodplain forests (Phillips et al., 1999; Smith, 1961). Eastern Massasauga Rattlesnakes are active from mid-March through early November with activity peaks in late April through June and late September and early October (Ernst and Ernst, 2003). In late fall, they seek out rodent and crayfish burrows for brumation (Tennant, 2003). Populations of the Eastern Massasauga Rattlesnake have declined greatly in Illinois and only four populations are known to persist in the state (CAP, unpubl. data), one of which is within the subject corridor.

C) Description of the Activities That Will Result in Taking
The take would come from activities associated with the construction of a bioswale on land owned by the FPDCC. The runoff from the Tollway is proposed to be conveyed into bioswales. Bioswales are drainage systems that are designed to improve water quality of the roadway runoff. They are planted with water tolerant grasses and forbs, contain underdrains, and are generally considered to be more state-of-the-art with regard to water treatment than simply allowing overland flow or using detention basins to treat roadway runoff. Many of the bioswales are to be constructed on FPDCC property, with one in the vicinity of known historic Eastern Massasauga Rattlesnake habitat.

The bioswale that is proposed within known historic Eastern Massasauga habitat will be approximately 1700' long and will vary in width from 8'-12'; it will occupy approximately 0.50 acre. An additional 0.5 acre of linear nature may be necessary for other temporary impacts due to construction activities and equipment movement however all activities are currently planned to take place within Tollway right-of-way and within the 0.5 acre of bioswale. The proposed bioswale plan is attached (identified as Site 21) and identifies the bioswale as up to 3500' in length, however only the northern portion of the bioswale is in the habitat location on Forest Preserve District property. The disturbance during the construction activities are of concern and the purpose of this Incidental Take application. However, the construction includes clearing undesirable woody species and replacing them with grasses and forbs. Once the bioswale is constructed, the rattlesnakes may in fact utilize the site.

D) Explanation of the Anticipated Adverse Effects
The anticipated adverse effects include:

1) Eastern Massasauga Rattlesnakes may be crushed or entombed by construction equipment or vehicles.
2) Temporary loss of habitat associated with excavation and construction activities for a bioswale.

2) Measures to Minimize and Mitigate Take (Including Funding Commitments)

A) Plans to minimize the area, estimated number of take and the amount of habitat affected.
The INHS surveyed the available habitat during the 2005 and 2006 survey seasons. This information coupled with documented observations by others has established a baseline for the number and locations of the Eastern Massasauga Rattlesnakes. The Tollway will have the habitat locations surveyed again, prior to construction, in the Spring of 2008. The INHS is under contract to conduct the surveys. In order to aid that search, the Tollway is also arranging for controlled burns (by contractor) at the sites to clear vegetation and improve search efficiency when feasible.

The surveys will continue throughout the duration of the roadway and bioswale construction time frame. The Tollway will erect fencing and/or signage at designated "No Intrusion Areas" adjacent to areas with known threatened and endangered species habitat

and erect an experimental snake barrier prior to construction activities. These efforts will be coordinated with the INHS, IDNR and USFWS.

The Tollway will develop and implement an Eastern Massasauga education program for all personnel involved in construction, operation and maintenance of the I-294 widening and reconstruction project. Initial meetings with the roadway contractor have already taken place. The education efforts of the personnel involved in the construction of the South Extension of I-355 was very successful with regard to the Blanding's turtles present near that project. That experience and cooperation of the contractors helped in minimizing impacts to known habitat areas adjacent to construction activities and avoided individual turtles that migrated onto the construction site.

The Illinois Tollway has dedicated project funding as part of the Planning Department budget established with Intergovernmental Agreements to provide for the monitoring of the Eastern Massasauga along I-294. This work is primarily being conducted by the Illinois Natural History Survey. Other contractors, such as those to conduct prescribed burns or brush clearing, also have dedicated funding.

B) Plans for Management of the Area Affected that Will Enable the Continued Use
The land and habitats of the area in question are under public ownership. The FPDCC owns and manages the property. Therefore the property is not endangered by secondary impacts due to urban development.

C) Description of All Measures to be Implemented to Minimize or Mitigate the Effects

1) Minimization of impacts is being satisfied by conducting prescribed burns followed by Eastern Massasauga surveys when feasible. Several surveys have taken place in recent years and will take place in Spring of 2008. The intent was and is to determine the snake's proximity to the bioswale construction sites. Additionally, the areas will be searched immediately prior to the construction activities. These efforts are intended to reduce the possibility that a snake will be killed by the construction activities.

2) The FPDCC has provided the Tollway with a "wish list" of activities that are intended to restore and enhance Eastern Massasauga habitat. This list, entitled "Rattlesnake Management Priorities for the Upper Des Plaines", May 21, 2007 was used as a restoration guide to evaluate conservation measures. The Tollway then met with the FPDCC, USFWS, IDNR and the INHS both together and separately on several occasions to discuss, evaluate, and prioritize measures to be implemented. Based on those discussions as well as field visits, it was concluded that area north of Dundee Road and south of Forest View Drive (herein referred to as the Portwine Road Bioswale Area) had the most potential for the Tollway to implement successful habitat restoration work.

Specifically, the Tollway intends to clear and burn 20 acres adjacent to the marsh and I-294 along with conducting an additional 50 acre controlled burn of the surrounding area. Within this surrounding 38 acre area, acres will be selectively cleared to facilitate burning

and search activities. The combination of these activities totals 70 acres for Eastern Massasauga habitat management (see attached Figure). The purpose of this work is to eliminate the canopy that has encroached within the historical habitat of the Eastern Massasauga. This location is the number one priority of the FPDCC and the USFWS. Aerial photographs of this area from 1938 indicate it was a mix of farmed land, hay meadows and sparse woodlands. The clearing of woody vegetation may also increase the hydrology of the area by eliminating the wicking action from that woody vegetation. As part of the clearing activity, the remaining stumps will receive an herbicide treatment to prevent resprouting. Once the clearing is complete, the 70 acre area will be burned as part of the Habitat Management plan and to aid in Eastern Massasauga surveys.

3) The Illinois Tollway has dedicated project funding as part of the Planning Department budget to provide for the monitoring of Eastern Massasauga's populations. The rattlesnake monitoring work is being conducted by the Illinois Natural History Survey with possible support of the USFWS; the vegetative management is to be done by private contractors and/or the FPDCC.

In summary, there has been a strong level of support for Eastern Massasauga Rattlesnake habitat restoration by various resource agencies. These agencies are committed to ongoing coordination and evaluation of the restoration efforts.

To further minimize construction impacts, the Tollway's Erosion and Sediment Control, Landscape Design Criteria Manual is being used. This Manual utilizes the latest techniques in sediment and erosion control design and implementation. No-intrusion signs and super silt fence has been installed and diligently maintained within the construction area.

D) Plans for Monitoring the Effects of Measures Implemented

The Illinois Natural History Survey has been contracted to supply Eastern Massasauga Rattlesnake monitoring prior to and during the construction activities. Annual Reports are provided to the Tollway that describe that year's efforts. The first two of the Annual Reports are available now and entitled "Survey and Assessment of Threatened and Endangered Freshwater Mussels, Fishes, Amphibians and Reptiles of the Illinois Interstate I-294/94 Tollway Improvement Corridor in Cook and Lake Counties", INHS Technical Reports 2006(2):1-14, January 25, 2006 and 2007(2):1-29+ii, January 15, 2007 (attached).

The Tollway has further committed to conducting during construction surveys from 2008-2009 as well as future Eastern Massasauga Rattlesnake surveys. These surveys are proposed to take place one year after roadway construction is complete (approximately 2010) and a final survey five years after bioswale construction (approximately 2015). However, as per the IGA with FPDCC there will be continual monitoring of the bioswales for 10 years. If there is evidence of Eastern Massasauga use of the bioswales or use of the incidental take mitigation area additional surveys will be considered at the request of resource and regulatory agencies.

For follow up management activities in the cleared areas, there will be one additional herbicide treatment to the remaining stumps to prevent resprouting.

E) Adaptive Management Practices That Will Be Used to Deal With the Changed or Unforeseen Circumstances That Affect the Effectiveness of Measures Instituted to Minimize or Mitigate the Effects of the Proposed Action

The education efforts of the personnel involved in the construction of the South Extension of I-355 was very successful with regard to the Blanding's turtles present near that project. In learning from that experience, the Tollway will develop and implement an Eastern Massasauga education program for all personnel involved in construction, operation and maintenance of the I-294 widening and reconstruction project. This will include an identification program and establish a telephone point of contact list. This may help in minimizing impacts to known habitat areas adjacent to construction activities as well as protect individual snakes.

The silt fence/experimental snake barrier will be monitored to ensure that it is maintained in working order. It will also be evaluated as to its effectiveness for preventing snakes from crossing onto the construction site. There will be an erosion control / environmental compliance inspector available to report snakes seen near the construction zone, and assist with any protocols developed to avoid harm to the species. If it appears to be ineffective, the INHS, IDNR, and the USFWS will meet and develop an alternative strategy to keep the snakes away from the construction activities.

Furthermore, the Agreement with the INHS is to continue the surveys for the Eastern Massasauga not just prior to but during the construction seasons. If snakes are located near construction activities, measures will be taken to ensure the individuals are not harmed.

F) Verification That Adequate Funding Exists to Support and Implement All Mitigation Activities Described In the Conservation Plan.

The Illinois Natural History Survey has been contracted by the Illinois Tollway to complete the studies. Also, the construction measures and minimization measures described above are all funded within existing Tollway contracts with the contractors and consultants and backed by "AAA" Bonds.

The Tollway has dedicated project funding as part of the Planning Department budget. At the conclusion of the 2008 monitoring and survey season, the Tollway will work with the Illinois Natural History Survey to determine the necessary efforts for the 2009 season.

3) A description of alternative actions the applicant considered that that would not result in take and the reasons that each of those alternatives was not selected. A "no-action" alternative shall be included in this description of alternatives.

The proposed action of widening the Tollway does not require additional Right-of-Way in northern Cook County for the roadway itself. The potential impact to habitat is due to the introduction of bioswales and their construction. The bioswales are located in, near or

adjacent to potential Eastern Massasauga habitat. Bioswales are proposed to improve the water quality of the area. The surface runoff from the roadway will be directed through the bioswales and not overland into the Forest Preserve, as it does under the current condition. This should improve the overall condition of the Forest Preserve and habitats for all species.

The no-action alternative for the bioswales was evaluated extensively. Numerous meetings with the Forest Preserve District staff, Board of Directors, the Illinois DNR, the USFWS, as well as private interest groups were held. Simply put, the no-action would allow surface runoff from the roadway to continue to flow onto the adjacent land with no treatment. The compensation measures of removing woody vegetation, restoring hydrology within some areas and improving the water quality will all contribute to the overall improvement of the adjacent habitats which are more beneficial to the species than doing nothing. Furthermore, the survey methods and protective construction measures were developed with resource agency input and were considered prudent to protect the species.

4) Data and information to indicate that the proposed taking will not reduce the likelihood of the survival in the wild, the biotic community of which the species is part of or the habitat essential to the existence in Illinois.

The Tollway will work diligently with the Forest Preserve District, IDNR, INHS, and the USFWS to develop a list of management and habitat restoration activities. The ecologists with the history and knowledge of the Eastern Massasauga Rattlesnake locations and habitat requirements were involved in the restoration recommendations. As such, it is the opinion of Tollway that the activities proposed will restore and enhance the habitat in such a way that the Eastern Massasauga will expand its current range. The ultimate goal is that the range and population numbers will increase as a result of the proposed habitat restoration measures.

5) An implementing agreement, which shall include, but not be limited to:
The existing agreement with the Illinois Natural History Survey is available for review if necessary. The Illinois Tollway will continue to utilize the expertise of the Illinois Natural History Survey, throughout the remainder of construction activities.

Massasauga Mitigation Proposal
0 200 400 600 800 1,000 Feet
N
Clear with stumps remaining and burn 20 acres
Burn 7.3 acres
Burn with selective clearing 38.3 acres
Burn 4.4 acres
TRI-STATE TOLLWAY
PICARDY DR
PICARDY CIR
SANDERS RD
DUNDEE RD
DUNDEE RD ROW
Legend
Burn
Burn with selective clearing
Clear with stumps remaining and burn
Date revised: 1/9/08

AERIAL SOURCE: ILLINOIS NATURAL RESOURCES GEOSPATIAL DATA CLEARINGHOUSE

N

200' 0 200'

- FOREST PRESERVE LIMIT
- BIOSWALE TYPE A
- BIOSWALE TYPE B
- BIOSWALE TYPE C
- BIOSWALE TYPE D
- BIOSWALE TYPE E
- BIOSWALE TYPE F

SITE 21 SHEET 1 OF 2
TYPE B (3,500')
INTERSTATE 294

Illinois Tollway
Open Roads for a Faster Future

YPE B - 3,400'

2730

2740

INTERSTATE 294

SITE 21 TYPE B - 1,000'/3,500'

SITE 21 TYPE B - 3,400'

PI STA 2760+53.79

SANDERS ROAD (NORTH CROSSING)

ERIAL SOURCE: ILLINOIS NATURAL RESOURCES GEOSPATIAL DATA CLEARINGHOUSE

N

200' 0 200'

FOREST PRESERVE LIMIT
BIOSWALE TYPE A
BIOSWALE TYPE B
BIOSWALE TYPE C
BIOSWALE TYPE D
BIOSWALE TYPE E
BIOSWALE TYPE F

SITE 21 SHEET 2 OF 2
TYPE B (3,500')
INTERSTATE 294

Illinois Tollway
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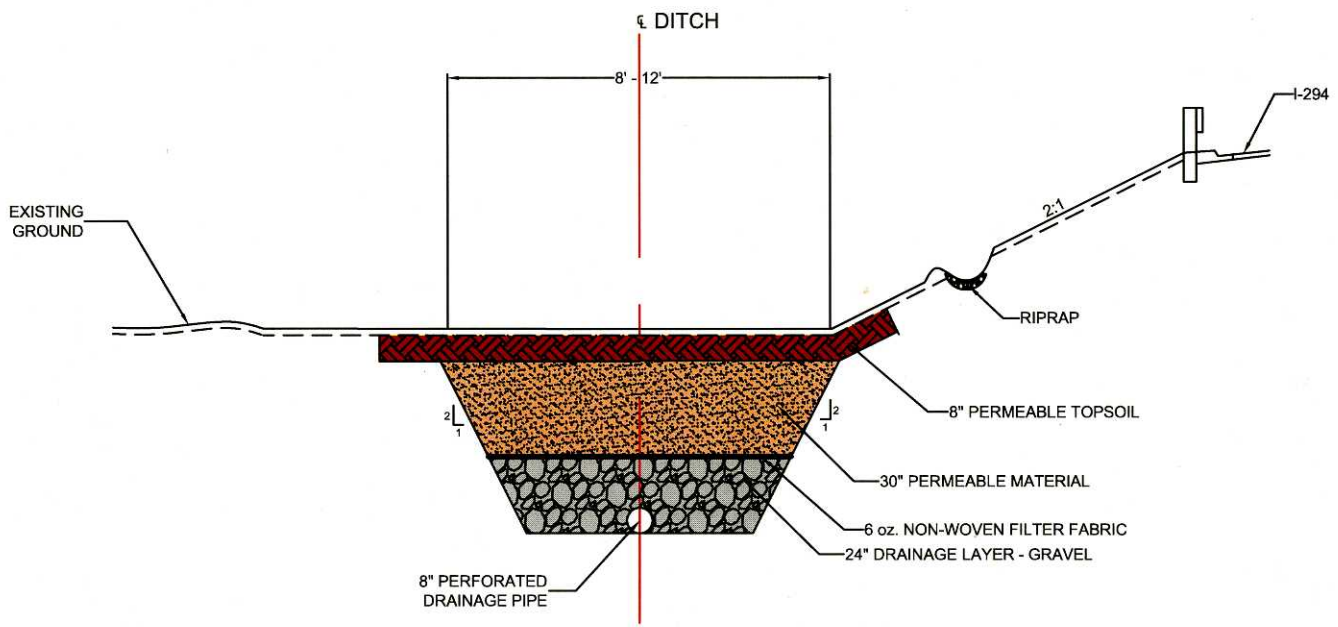
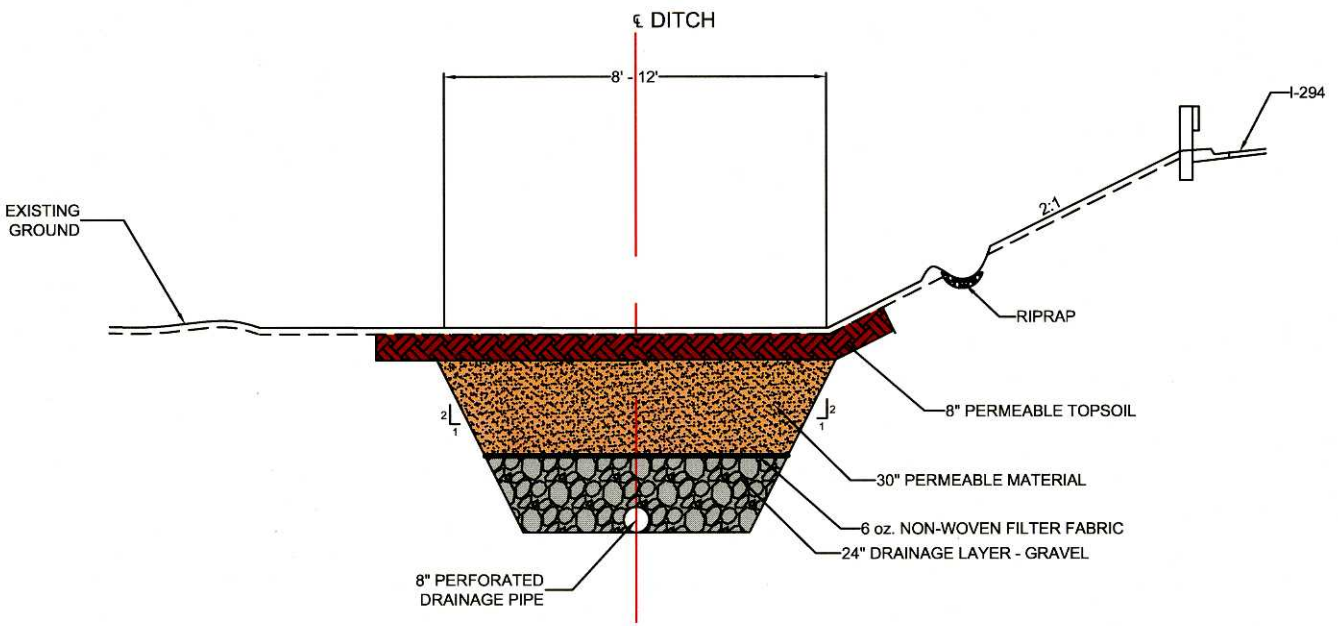
Site 21 Bioswale Concept Design



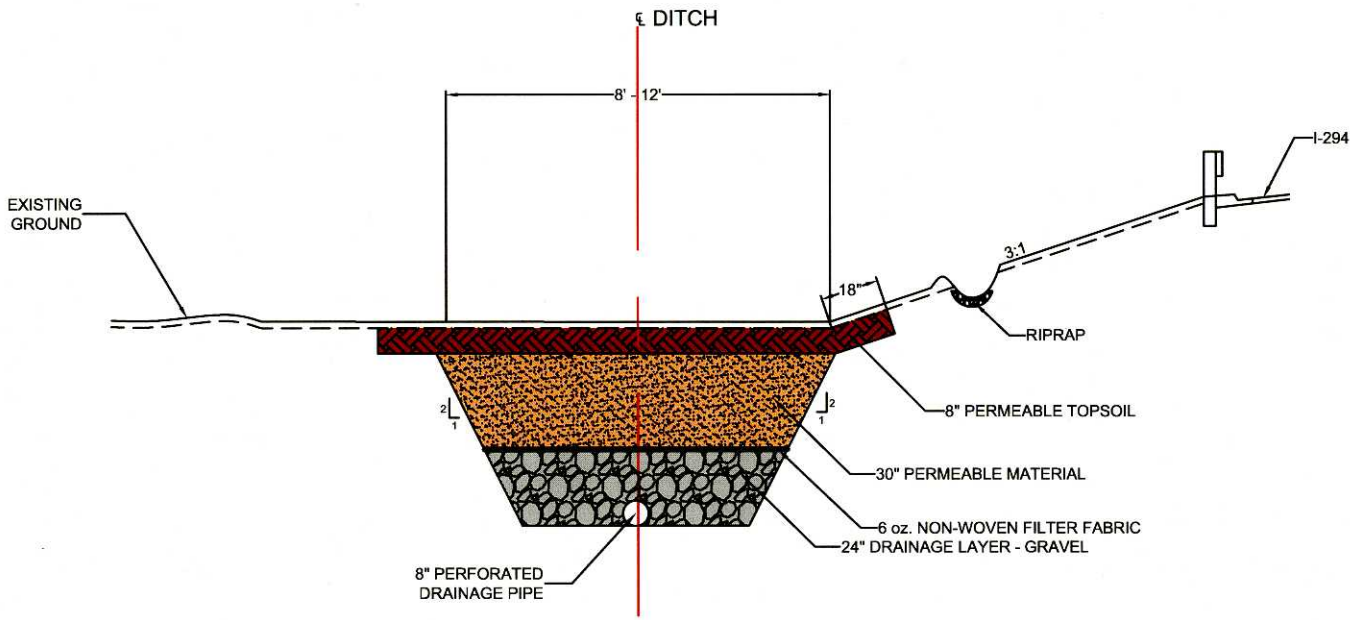
TYPICAL BIOSWALE - TYPE B TERRACED (2:1)
RETAINING DITCH GRADE SECTION
LEFT OFFSET
NOT TO SCALE

Illinois Tollway
Open Roads for a Faster Future



TYPICAL BIOSWALE - TYPE B TERRACED (2:1)
RETAINING DITCH GRADE SECTION
LEFT OFFSET
NOT TO SCALE

Illinois Tollway
Open Roads for a Faster Future



TYPICAL BIOSWALE - TYPE B TERRACED (3:1)
RETAINING DITCH GRADE SECTION
LEFT OFFSET
NOT TO SCALE

Illinois Tollway
Open Roads for a Faster Future

Illinois Natural History Survey Reports
2005 and 2006 Field Seasons

Survey and Assessment of Threatened and Endangered Mussels, Fishes, Amphibians, and Reptiles of the Illinois Interstate I-294/94 Tollway Improvement Corridor in Cook and Lake Counties, Results of the 2005 Field Season

Prepared by:

Andrew R. Kuhns
Christopher A. Phillips
Jeremy S. Tiemann

Center for Biodiversity
Illinois Natural History Survey
1816 South Oak Street
Champaign, Illinois 61820

ILLINOIS NATURAL HISTORY SURVEY

25 January 2006

Report to:

Illinois State Toll Highway Authority
Environmental Program
2700 Ogden Avenue
Downers Grove, Illinois 60515

Center for Biodiversity
Technical Report 2006(2):1-14

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INTRODUCTION

The Illinois Natural History Survey was contracted by the Illinois State Toll Highway Authority in 2005 to conduct threatened and endangered species surveys within the corridor of Interstate I-294/94 from Wisconsin-Illinois State line South to U.S. Highway 14 in Lake and Cook counties. A search was conducted of the Illinois Natural Heritage Database for all threatened and endangered mussel, fish, amphibian, and reptile species locations falling within a 1.6 km buffer zone of the existing I-294/94 corridor. Sites were plotted onto aerial photographs to determine exact locations within the corridor and most were surveyed for suitable habitat and/or continued presence of the species.

RESULTS

Five threatened or endangered species were documented at 11 localities within the 1.6 km buffer zone of I-294/94 from the Illinois-Wisconsin border to US Highway 41. For fishes, there are five historical localities of the state endangered Iowa Darter *Etheostoma exile* and one location of the state threatened Blackchin Shiner *Notropis heterodon* (Table 1). For reptiles, there are two historical localities for the state threatened Kirtland's Snake *Clonophis kirtlandii*, two locations for the state threatened Blanding's Turtle *Emydoidea blandingii*, and one location for the state endangered Massasauga *Sistrurus catenatus* (Table 1). No threatened or endangered mussel or amphibian species were documented in the search. Species specific results are presented below. Figures are presented from North to South. Figure 1 shows the location of subsequent figures relative to entire reach of the tasked I-294/94 corridor.

***Etheostoma exile* (Iowa Darter). State Endangered (1989 listing date).**

Historically, the Iowa Darter was generally distributed throughout the glacial lakes in the northern fourth of Illinois. It can be found in clear well vegetated lakes, slough's, and low gradient creeks. In creeks, it prefers mud or clay bottomed pools with detritus and brush (Smith, 1979; Page & Burr, 1991). Habitat degradation such as wetland draining, pollution and the introduction of non-native fishes is the primary cause of this species decline in Illinois (Herkert, 1992).

Five locations for this species are documented within 1.6 km of the I-294/94 corridor (Table 1; Figures 2, 3, 4, 6).

EO 3730: Mill Creek, 1 mi S of Wadsworth (Fig. 2, Plate 1a).

The most recent record for the species at this site was 26 May 1999. Mill Creek [42.4183°N, 87.9453°W (WGS84/NAD83) USGS **Wadsworth** Quad] was surveyed south of Wadsworth from the US 41 bridge (BR 671) upstream (SW) to the East side of I-294/94 on 12 October 2005. The water was classified as turbid, with little flow. The substrate was silt over sparse gravel and sand. There was little vegetation and the odor of sewage was prevalent. No Iowa darters were encountered in approximately 30 minutes of sampling with a standard 10'

minnow seine. The habitat at this site is only marginally suitable as there was little vegetation and the water quality appeared poor.

EO 6634: Sterling Lake (Fig 2).

The most recent record for the species at this site was 02 August 1994. Sterling Lake [42.4757°N, 87.9402°W (WGS84/NAD83) USGS **Wadsworth** Quad] was not visited. The distance of the lake from I-94 make it unlikely that it will be affected by construction.

EO 4645: Old School Lake (Fig. 3, Plate 1b).

The most recent record for the species at this site was 07 May 1997. Old School Lake [42.2769°N, 87.9147°W (WGS84/NAD83) USGS **Libertyville** Quad] was sampled on 12 October 2005. The water was clear and well vegetated with a mucky substrate. We used a 10' seine to sample fishes but did not encounter any Iowa Darters. Despite no captures during limited seining, the site appears optimal for the continued occurrence of the Iowa Darter, thus additional sampling will be conducted in 2006.

EO 3313: West Fork North Branch Chicago River (Fig. 4).

The most recent record for the species at this site was 10 September 1993. The West fork of the North Branch of the Chicago River [42.2117°N, 87.8950°W (WGS84/NAD83) USGS **Wheeling** Quad] was surveyed on 12 October 2005. The habitat of this area was still water, sparse vegetation, and a clay and concrete substrate. We used a 10' seine to sample fishes but did not encounter any Iowa Darters. The site was considered poor habitat for the Iowa Darter because of lack of aquatic vegetation.

EO 5592: Beck Lake (Fig. 6, Plate 1c).

The most recent record for the species at this site was 07 April 1990. Beck Lake [42.0741°N, 87.8743°W (WGS84/NAD83) USGS **Park Ridge** Quad] was visited on 12 October 2005. The lake was classified as having a silt bottom with some aquatic vegetation. Water levels were low resulting in the majority of aquatic vegetation being dead. We used a 10' seine to sample fishes but did not encounter any Iowa Darters. This site will be sampled again in 2006.

***Notropis heterodon* (Blackchin Shiner). State Threatened (1989 listing date).**

The Blackchin Shiner occurs in Illinois only in Lake and Cook counties. The habitat includes clear, well-vegetated glacial lakes and the streams entering and exiting the lakes (Smith, 1979). Human modification of habitat is the primary cause for the listing of this species (Smith, 1979).

One location for *N. heterodon* is documented within the corridor (Table 1; Figure 4).

EO 6527: Des Plaines River at Rt 21 Bridge (Fig. 5. Plate 1d).

The most recent record for the species at this site was 10 July 1967. This site [42.1011°N, 87.8836°W (WGS84/NAD83) USGS **Arlington Heights** Quad] was visited on 12 October 2005 and examined from the Rt. 21 Bridge to approximately 100 m downstream. The habitat of this area was still, turbid water with little aquatic vegetation and silted substrate. The odor of chlorine from a nearby sewage treatment plant was evident. We used a 10' minnow seine to sample fishes in areas where aquatic vegetation was present. No *N. heterodon* were collected. The turbid water now found in most reaches of the Des Plaines River likely accounts for the elimination of *N. heterodon* from the entire river basin.

***Clonophis kirtlandii* (Kirtland's Snake). State Threatened (1994 listing date).**

Historically, this species occurred in suitable habitat in the northern 2/3 of Illinois. Kirtland's snakes occupy wet prairie, wet meadows, and grassy areas along streams, creeks, ditches and ponds and are occasionally found in moist vacant lots in urban settings (Phillips et al., 1999; Minton, 2001).

There are two historical localities for Kirtland's snakes within the southern quarter of the corridor (Table 1, Figure 5). EO 2382 is based on two observations. The first was a gravid female collected in 1971 and the second was a snake observed on 25 May 1987. EO 5122 is based on a 1993 observation of 1 individual. The severe drought in the area, which causes Kirtland's snakes to remain underground, prevented us from surveying in 2005.

EO 2382: Carle Woods north of Big Bend Lake (Fig. 6).

This site was not visited in 2005. We will conduct visual encounter surveys and cover-board surveys at this site in 2006.

EO 5122: Kennicott's Grove, W of Glenview (Fig. 6).

This site was not visited in 2005. We will conduct visual encounter surveys and cover-board surveys at this site in 2006.

***Emydoidea blandingii* (Blanding's Turtle). State Threatened (1998 listing date).**

Blanding's turtles inhabit quiet waters in marshes, sedge meadows, prairie wetlands, and shallow, well vegetated ponds and lakes with adjacent upland areas for nesting (Phillips et al., 1999; Ernst et al., 1994). Habitat loss and degradation are the primary causes for the listing of this species (Phillips et al., 1999).

Within the corridor there are two historical localities for Blanding's Turtles (Table 1, Figure 3, 6). EO 322 was a non-gravid female found in a small stream on 02 August 1999. EO 4738 was an adult observed basking in a ditch near successional woods in 1994.

EO 4738: Southwest of Middlefork Savanna Preserve (Fig. 3, Plate 1e &1f).

This site [42.2531°N, 87.8933°W (WGS84/NAD83) USGS **Libertyville** Quad] was visited on 08 October and 16 October 2005. Numerous wetland types occur in the area including cattail marsh, sedge meadows, ephemeral woodland pools, and ponds. Potential habitat was found within 40 meters of I-294/94. The biologist conducted a visual encounter survey for 1.5 man hours on 16 October and observed > 10 painted turtles *C. picta* basking in a large pond within Middlefork Savanna Nature Preserve. No *E. blandingii* were observed. With the exception of two ponds in Middlefork Savanna Nature Preserve, all wetlands were dry and therefore un-trappable in 2005. This site will be sampled extensively with baited hoop traps and visual encounter surveys in 2006.

EO 322:. Winkleman Rd. b/w Sanders Rd. and Milwaukee Ave. (Fig. 6).

This location [42.1049°N, 87.8833°W (WGS84/NAD83) USGS **Arlington Heights** Quad] was visited on 12 October 2005. Suitable habitat was found north and south of the Rt. 21 bridge over the Des Plaines River in backwater sloughs. There is a wide swath (~800 m) of developed land between I-294/94 and suitable habitat at this site making it unlikely that work within the 150 m corridor will impact the species at this location.

***Sistrurus catenatus* (Eastern Massasauga). State Endangered (1994 listing date).**

Historically, Massasaugas occurred in the northern 2/3 of the state excluding the northwestern unglaciated region of Illinois. The preferred habitat of this species is wet prairies, bogs, marshlands, old fields and floodplain forests (Phillips et al., 1999; Smith, 1961). Populations of this species have declined greatly in Illinois and only 4 populations are known to persist in the state (CAP, *unpubl. data*), one of which is within the I-294/94 corridor (Table 1, Figure 4).

EO 5070: Between the Des Plaines River and I-294/94 from Willow Rd. north to Deerfield Rd. (Fig. 5).

At least 10 observations of *S. catenatus* are included in this database entry. On 06 September 2005 one non-gravid female was observed at 1940 hrs along the main E-W path within the Forest Preserve District of Cook County (FPDCC) property at the NW corner of the intersection of Willow Road and Sanders Road (Anton *pers. obs.*, 2006). In 1992, a specimen was encountered dead on the shoulder of the IL 68/ I-294 interchange. Extensive visual encounter surveys will be conducted for this species within this general area in 2006.

SUMMARY

Optimal habitat for the Iowa Darter was observed at Old School Lake and potentially suitable habitat for the species was found at Beck Lake. These sites will be revisited and seined in 2006. The *N. heterodon* site appears unlikely to still harbor the species. One Massasauga was reported from FPDCC property in 2005 and we will conduct visual encounter surveys of this general area in 2006. We did not survey for Kirtland's Snake in 2005 but will do so concurrently with the Massasauga surveys in 2006. Suitable Blanding's Turtle habitat was found near Middlefork Savanna Nature Preserve just north of the Tollway Oasis West of Lake Forest, but due to the severe drought in the region, we were unable to trap this site in 2005. We will continue visual encounter surveys and initiate trapping at this site in 2006 pending suitable water depth.

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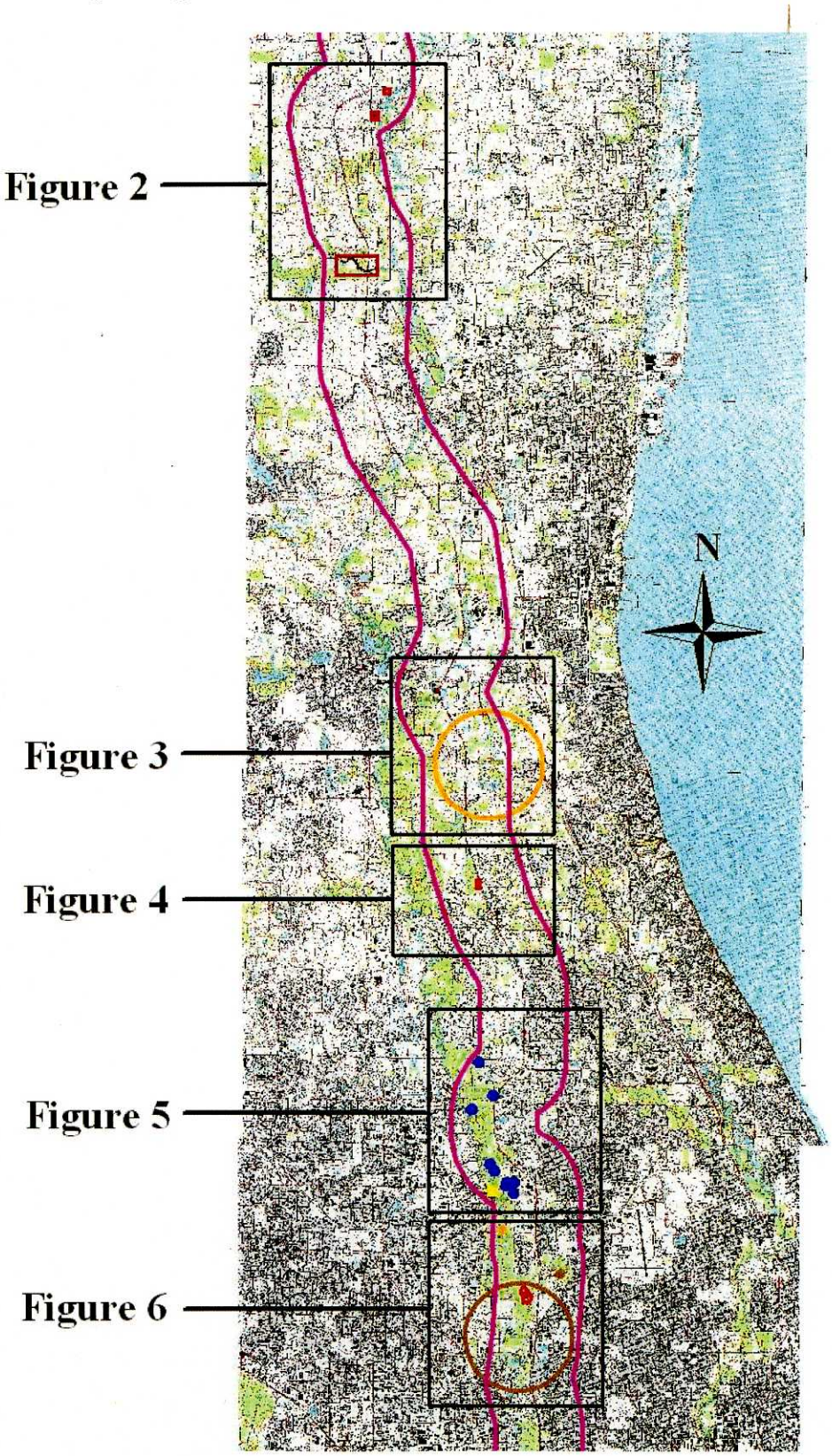
Table 1. Historical observation locations for Threatened and Endangered fishes, amphibians and reptiles within 1.6 km of the I-294/94 corridor in Lake and Cook counties from the Illinois-Wisconsin State Line to US Highway 14. The coordinates are given in DMS and are taken from the Illinois Natural Heritage Database.

EO	Species	Location	Latitude	Longitude
2382	*C. kirtlandii*	Carle Woods, N of Big Bend Lake	42°03'35"N	87°52'31"W
5122	*C. kirtlandii*	Kennicott's Grove, W of Glenview	42°04'52"N	87°51'25"W
322	*E. blandingii*	Ditch on N shoulder of Winkleman Rd b/w Sanders Rd. and Milwaukee Ave.	42°05'45"N	87°52'60"W
4738	*E. blandingii*	Just SW of Middlefork Savanna Nature Preserve boundaries	42°15'08"N	87°53'27"W
3730	*E. exile*	Mill Creek, 1 mi S of Wadsworth	42°25'08"N	87°57'07"W
4645	*E. exile*	SW int Rt 176 and 294; in Old School Forest Preserve; in Old School Lake	42°16'37"N	87°54'53"W
5592	*E. exile*	Beck Lake w/in FPDCC, ~ 2 mi WSW of Glenview Naval Air Station	42°04'25"N	87°52'15"W
3313	*E. exile*	West Fork North Branch Chicago River, W of Lake Forest	42°12'42"N	87°53'42"W
6334	*E. exile*	Sterling Lake	42°28'10"N	87°56'41"W
6527	*N. heterodon*	Des Plaines River at Il Rt 21 Bridge	42°06'03"N	87°53'06"W
5070	*S. catenatus*	North of Willow Rd., East of Wheeling	42°06'39"N	87°52'48"W
5070	*S. catenatus*	Dam1 - Willow/Sanders Prairie ~150 m from bridge over Willow Rd.	42°06'39"N	87°52'48"W
5070	*S. catenatus*	Ryerson Conservation area near Riverwood, South to Willow-Palatine Rd,	42°06'39"N	87°52'48"W
5070	*S. catenatus*	Northfield, E of Des Plaines R.	42°06'39"N	87°52'48"W

Figure 1. I-94/294 tollway improvement corridor in Cook and Lake counties showing locations of subsequent figures in relation to the overall corridor.



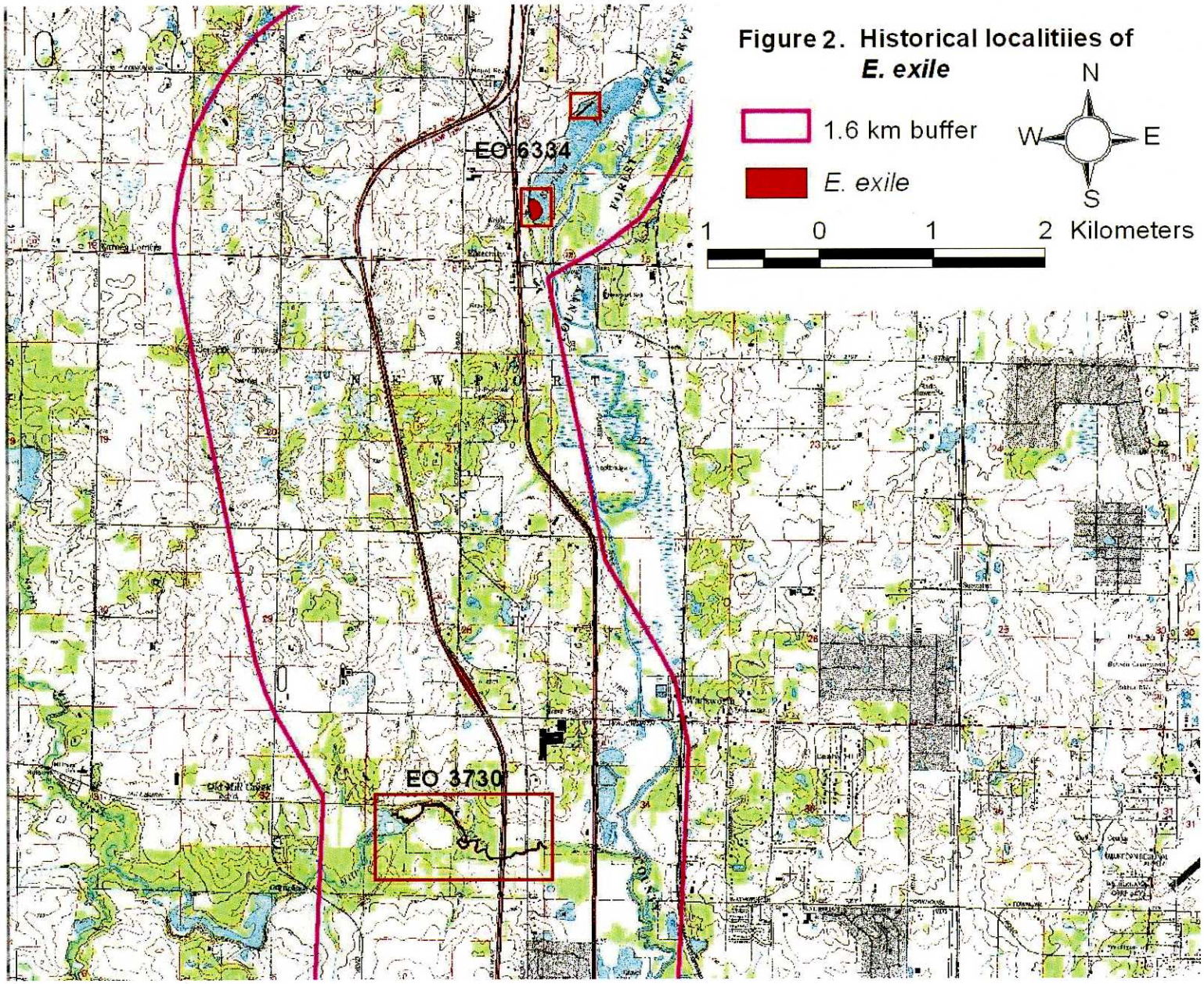


Figure 2. Historical localitiies of *E. exile*

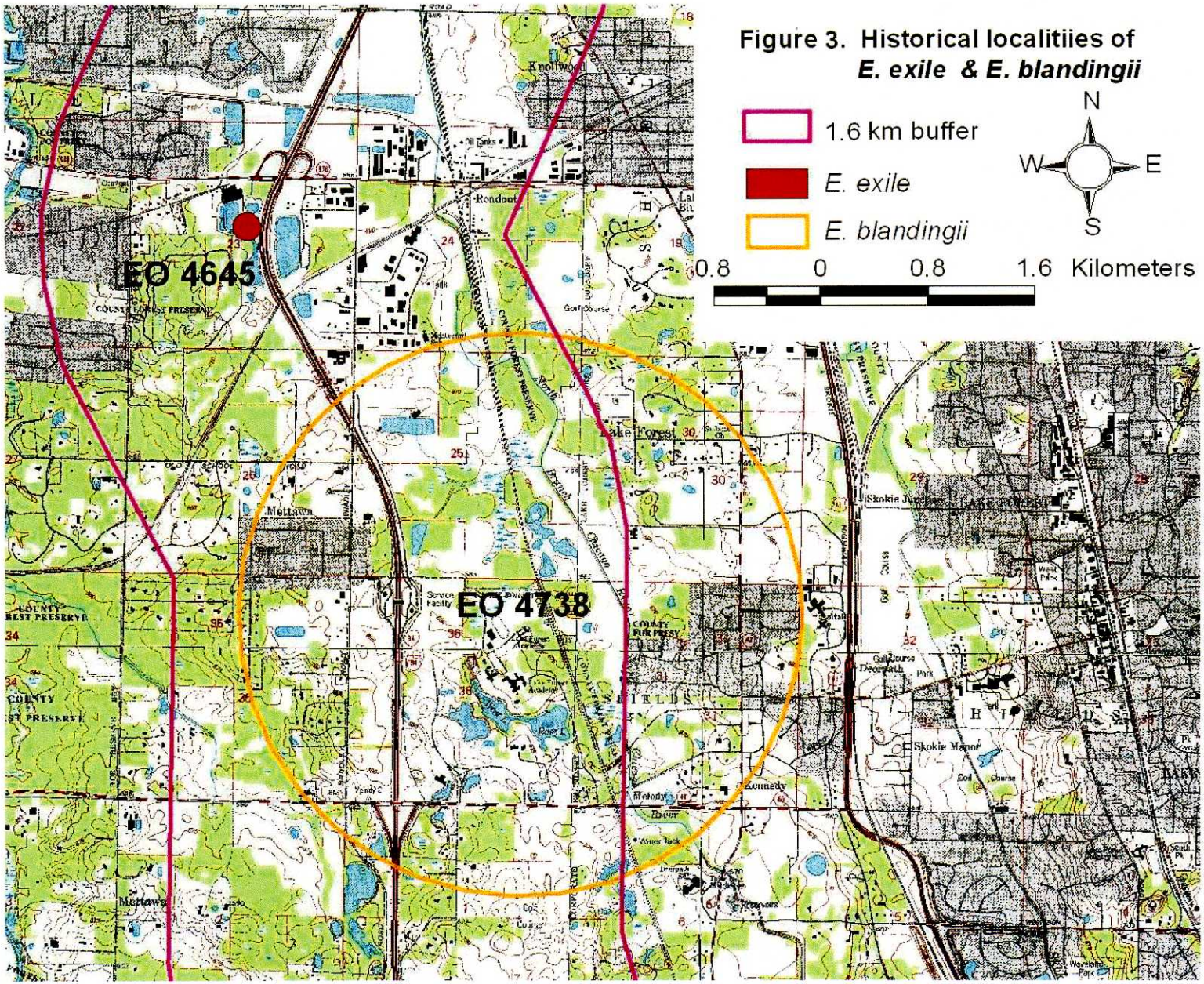
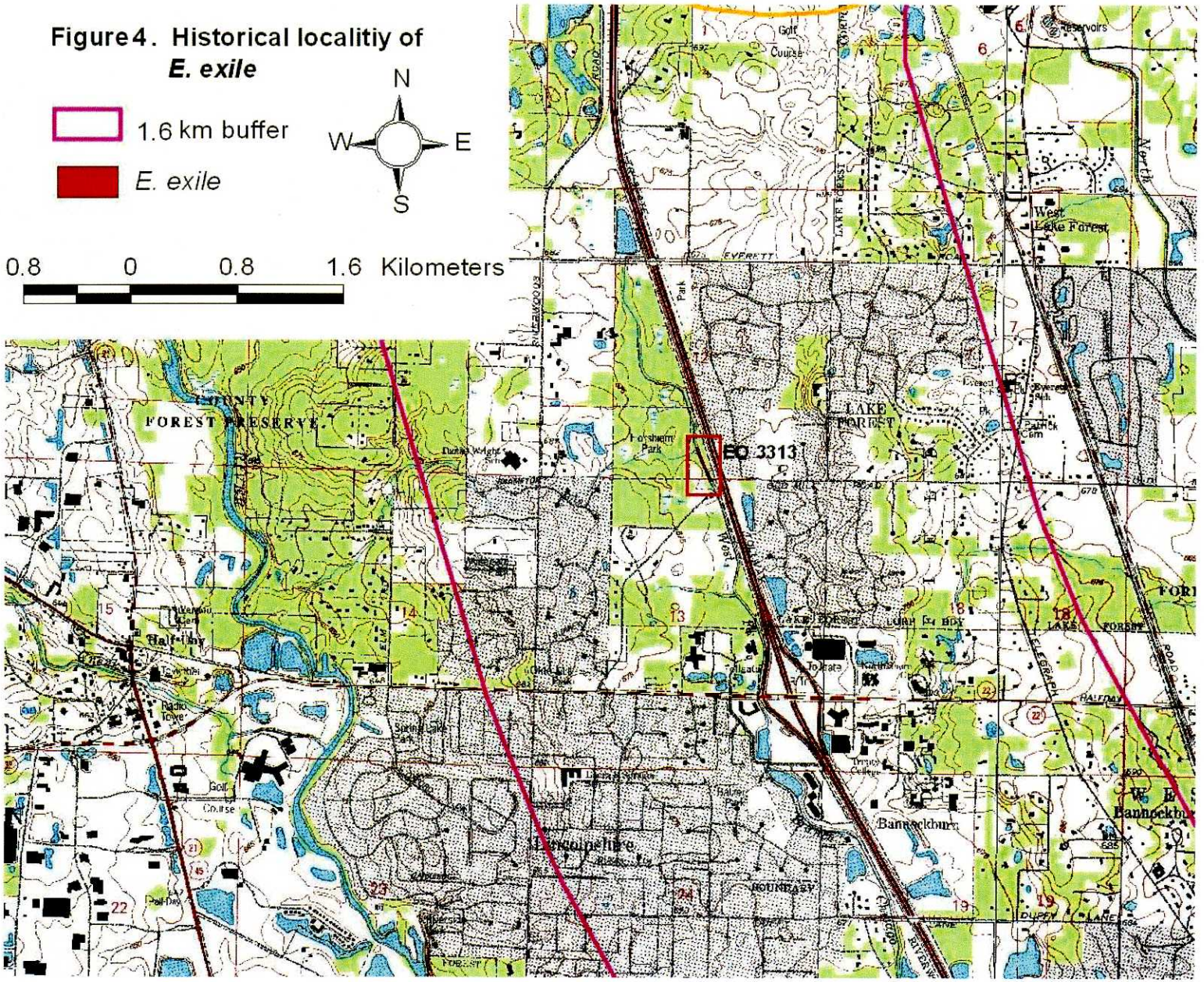


Figure 3. Historical localitiies of *E. exile* & *E. blandingii*

Figure 4. Historical localitiy of *E. exile*



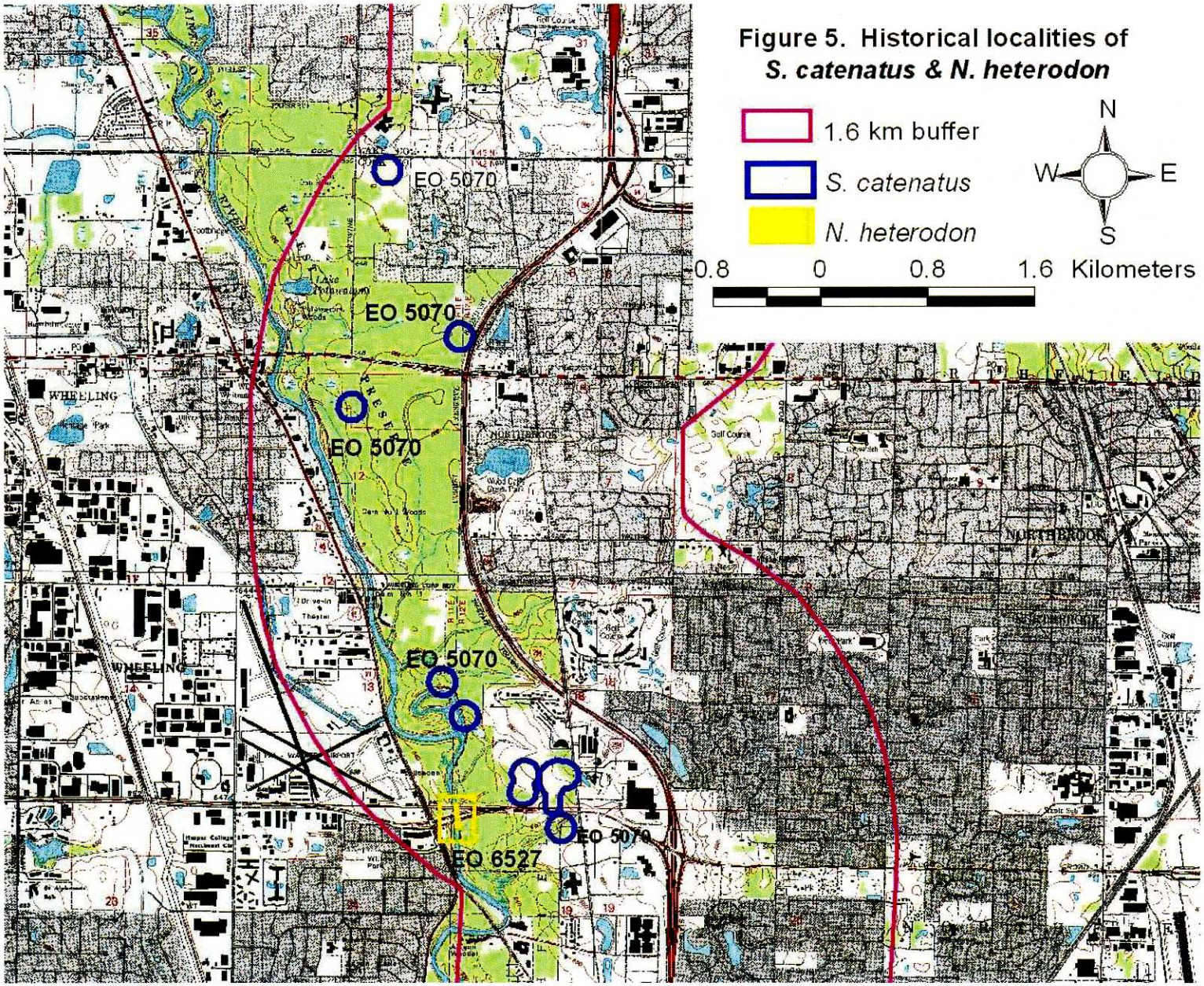


Figure 5. Historical localities of *S. catenatus* & *N. heterodon*

Figure 6. Historical localities of *E. exile, E. blandingii, & C. kirtlandii*

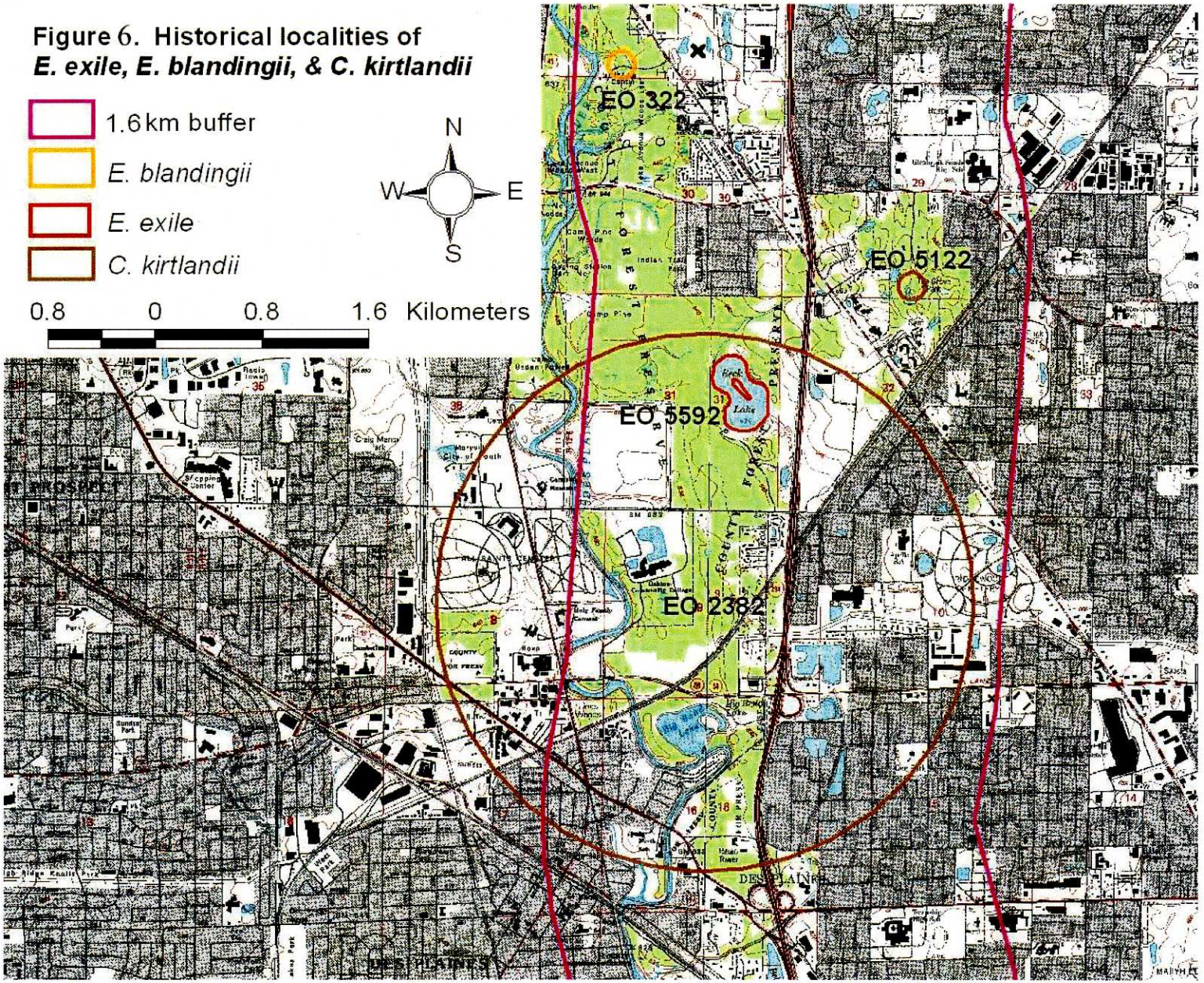


Plate 1. Habitat photographs of historical locations for threatened and endangered species occurring within 1.6 km of the I-94/294 corridor. **a.** EO 3730, Mill Creek. **b.** EO 4645, Old School Lake. **c.** EO 5592, Beck's Lake **d.** EO 6527, Des Plaines River at Rt. 21 bridge. **e.** EO 4738, SW of Middlefork Savanna (dry sedge meadow). **f.** EO 4738, Middlefork Savanna (pond/cattail wetland)

a.

b.

c.

d.

e.

f.

ILLINOIS NATURAL HISTORY SURVEY

TECHNICAL REPORT

Survey and Assessment of Threatened and Endangered Freshwater Mussels, Fishes, Amphibians and Reptiles of the Illinois Interstate I-294/94 Tollway Improvement Corridor in Cook and Lake Counties

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INTRODUCTION

The Illinois Natural History Survey was contracted by the Illinois State Toll Highway Authority in 2005 to conduct threatened and endangered species surveys within the Interstate I-294/94 corridor in Lake and Cook counties from the Wisconsin-Illinois State line south to U.S. Highway 41. Because the exact locations of proposed take and land disturbances within the corridor were unknown, a search was conducted of the Illinois Natural Heritage Database for all threatened and endangered freshwater mussel, fish, amphibian, and reptile species locations falling within a 1.6 km buffer zone of the existing I-294/94 corridor. Sites were plotted onto aerial photographs to determine exact locations within the corridor and most were surveyed for suitable habitat and/or continued presence of the species. Due to an extreme drought in the region in 2005, numerous sites could not be adequately sampled but a preliminary report was submitted (Kuhns et al., 2006). Sites that were visited in 2005 and appeared to warrant extensive sampling were revisited in 2006. This report contains the results of the 2005 and 2006 surveys.

RESULTS

Historical records of five threatened or endangered species were documented at 11 localities within the 1.6 km buffer zone of the I-294/94 corridor from the Wisconsin-Illinois border to U.S. Highway 41. For fishes, there are five historical localities of the state endangered Iowa Darter *Etheostoma exile* and one location of the state threatened Blackchin Shiner *Notropis heterodon* (Table 1). For reptiles, there are two historical localities of the state threatened Kirtland's Snake *Clonophis kirtlandii*, two locations of the state threatened Blanding's Turtle *Emydoidea blandingii*, and one location of the state endangered Eastern Massasauga *Sistrurus catenatus* (Table 1). No threatened or endangered freshwater mussel or amphibian species were documented in the search. Species specific results are presented below. Figures are presented from north to south. Figure 1 shows the location of subsequent figures relative to entire reach of the tasked I-294/94 corridor.

Iowa Darter (*Etheostoma exile*). State Endangered (1989 listing date).

The Iowa Darter is brown to olive in color with dark brown mottling above the lateral line and is yellow or white below the lateral line; there are 8-12 dark saddles on the dorsum, and 10-14 dark vertical bars on the side. The nape, cheek, opercle, and belly are fully scaled, whereas the breast and parietal region are not. During the breeding season, the male dorsum become bluish with greenish lateral blotches and reddish coloration between blotches, horizontal bands of blue and orange through the first dorsal fin, and orange on the lower side; the female does not develop the bright coloration (Smith, 1961). Historically, the Iowa Darter was generally distributed throughout the glacial lakes in the northern fourth of Illinois. It can be found in clear well vegetated lakes, sloughs, and low gradient creeks (Smith, 1961). In creeks, it prefers mud or clay bottomed pools with detritus and brush (Smith, 1979; Page & Burr, 1991). Habitat degradation, including wetland draining, pollution, and introduction of non-native fishes,

are the primary cause of this species decline in Illinois (Herkert, 1992). Five locations for this species are documented within 1.6 km of the I-294/94 corridor (Table 1; Figures 2, 3, 4, 6).

EO 3730: Mill Creek, 1 mi S of Wadsworth (Fig. 2, Plate 1).
The most recent record for the species at this site was 26 May 1999. Mill Creek [42.4183°N, 87.9453°W (WGS84/NAD83) USGS **Wadsworth** Quad] was surveyed south of Wadsworth from the U.S. Highway 41 bridge (BR 671) upstream (SW) to the east side of I-294/94 on 12 October 2005. The water was turbid, with little flow; the odor of sewage was prevalent. The substrate was silt over sparse gravel and sand with a moderate amount of woody debris but little vegetation. No Iowa Darters were encountered in approximately 30 minutes of sampling with a standard 10' minnow seine. The habitat at this site is only marginally suitable as there was little vegetation and the water quality appeared poor.

EO 6634: Sterling Lake (Fig 2, Plate 1).
The most recent record for the species at this site was 02 August 1994. Sterling Lake [42.4757°N, 87.9402°W (WGS84/NAD83) USGS **Wadsworth** Quad] was not visited. The distance of the lake from I-94 makes it unlikely that it will be impacted by construction.

EO 4645: Old School Lake (Fig. 3, Plate 3).
The most recent record for the species at this site was 07 May 1997. Old School Lake [42.2769°N, 87.9147°W (WGS84/NAD83) USGS **Libertyville** Quad] was sampled on 12 October 2005 and again on 26 July 2006. The water was clear and well vegetated with a cobble, gravel, and mucky substrate. A 10' seine was used to sample fishes but because of the abundant aquatic vegetation and substrate, sampling proved difficult. Despite no captures during seining, the site appears optimal for the continued occurrence of the Iowa Darter.

EO 3313: West Fork North Branch Chicago River (Fig. 4, Plate 4).
The most recent record for the species at this site was 10 September 1993. The West fork of the North Branch of the Chicago River [42.2117°N, 87.8950°W (WGS84/NAD83) USGS **Wheeling** Quad] was surveyed on 12 October 2005. The habitat of this area was still water, sparse vegetation, and a clay and concrete substrate. A 10' seine was used to sample fishes. No Iowa Darters were encountered. The site was considered poor habitat for the Iowa Darter because of lack of aquatic vegetation.

EO 5592: Beck Lake (Fig. 6, Plate 5).
The most recent record for the species at this site was 07 April 1990. Beck Lake [42.0741°N, 87.8743°W (WGS84/NAD83) USGS **Park Ridge** Quad] was visited on 12 October 2005 and again on 26 July 2006. The lake was classified as having a silt bottom with some aquatic vegetation. In 2005, water levels were low resulting in the majority of aquatic vegetation being dead. A 10' seine was used

to sample fishes along a 200 m stretch of shoreline but no Iowa Darters were encountered. Aquatic vegetation was mainly in the form of emergent reeds and cattails along the shoreline. This site does not appear to provide optimal habitat for the Iowa Darter.

Blackchin Shiner (*Notropis heterodon*). State Threatened (1989 listing date).

The Blackchin Shiner is a slender fish that is straw colored dorsally and silvery beneath, with a dark band from the snout, through the eye, and to the caudal fin (Smith, 1961). In Illinois the Blackchin Shiner occurs only in Lake, Cook, and McHenry counties in clear, well-vegetated glacial lakes and associated drainage streams (Smith, 1979). Human modification of habitat is the primary cause for the listing of this species (Smith, 1979). One location for the Blackchin Shiner is documented within the I-294/94 corridor (Table 1; Figure 4).

EO 6527: Des Plaines River at Rte 21 Bridge (Fig. 5. Plate 6).
The most recent record for the species at this site was 10 July 1967. This site [42.1011°N, 87.8836°W (WGS84/NAD83) USGS **Arlington Heights** Quad] was visited on 12 October 2005 and examined from the Rte 21 Bridge to approximately 100 m downstream. The habitat of this area was still, turbid water with little aquatic vegetation and silted substrate. The odor of chlorine from a nearby sewage treatment plant was evident. A 10' seine was used to sample fishes in areas where aquatic vegetation was present. No Blackchin Shiners were collected. This site does not appear to provide optimal habitat for the species

Kirtland's Snake (*Clonophis kirtlandii*). State Threatened (1994 listing date).

Kirtland's snake is a small snake identified by its pink to red ventral surface with a row of black, rounded spots on each side of the venter (Ernst & Ernst, 2003). Kirtland's snakes require damp open habitats, including wet prairie, wet meadows, and grassy areas along streams and ponds, and are occasionally found in moist vacant lots in urban settings (Phillips et al., 1999; Minton, 2001) This species is most active in spring and fall but has been found in all months of the year (Ernst & Ernst, 2003). They are most active at night but can be found during the day under sheltering debris and in mouths of crayfish burrows (Ernst & Ernst, 2003). Historically, Kirtland's Snakes occurred in suitable habitat in the northern two-thirds of Illinois (Smith, 1961). There are two historical localities for Kirtland's snakes within the southern quarter of the corridor (Table 1, Figure 5). The severe drought in the area, which causes Kirtland's snakes to remain underground, prevented surveying in 2005 but both sites were visited in 2006.

EO 2382: Carle Woods north of Big Bend Lake (Fig. 6, Plate 7).
This record is based on a 1993 observation of 1 individual. In 2006, visual encounter surveys (VES) were conducted on 31 May, and 12, 13, 14, 22, 25, 26 June for a total of 23.8 search hours. During VES, natural and artificial cover was

flipped in an attempt to find Kirtland's snakes. Suitable habitat was found underneath a power line corridor with an abundance of cover objects and numerous crayfish burrows. The site was mowed with a brush-hog sometime between the 22nd and 25th of June and much of the cover was removed. We encountered Common Garter Snakes, *Thamnophis sirtalis*, 9 times, Plains Garter Snakes, *Thamnophis radix*, 3 times, and Brown Snakes, *Storeria dekayi*, once. No Kirtland's snakes were found. If Kirtland's snakes remain at the site, it is unlikely that improvements to I294-94 would impact the population. The site is separated from the tollway by the Union Pacific Railway bed, manicured grass, N. East River Road, and a sound barrier wall.

EO 5122: Kennicott's Grove, W of Glenview (Fig. 6, Plate 8).
This record is based on two independent observations. The first was a gravid female collected in 1971 and the second was a snake observed on 25 May 1987. VES were conducted near the reported coordinates at this site. Available cover objects were flipped on 22, 25 and 26 of June 2006 for a total of 11.6 search hours. The only snake species encountered at this site was a Common Garter Snake. Most wet meadows appear to have been encroached by woody vegetation resulting in unsuitable habitat for Kirtland's Snakes at this site. Subsequent to the surveys, information was received that the actual sighting occurred in a different area of Kennicott's Grove. This area was visited on 30 November to search for suitable habitat. A small area of approximately 120m x 50m was found that could still harbor Kirtland's Snakes (Plate 11).

Blanding's Turtle (*Emydoidea blandingii*) State Threatened (1998 listing date).

The Blanding's Turtle is a relatively large, semi-aquatic turtle identified by its hinged plastron and bright yellow chin and throat. Blanding's Turtles inhabit quiet waters in marshes, sedge meadows, prairie wetlands, and shallow, well vegetated ponds and lakes with adjacent upland areas for nesting (Phillips et al., 1999; Ernst et al., 1994). Female Blanding's Turtles often travel considerable distances to nest, and both sexes spend considerable amount of time on land (Cahn, 1937). Habitat loss and degradation are the primary causes for the listing of this species (Phillips et al., 1999). Within the corridor, there are two historical localities for Blanding's Turtles (Table 1, Figures 3 & 6).

EO 322: Winkleman Rd. between Sanders Rd. and Milwaukee Ave. (Fig. 6, Plate 6).
This record is of a non-gravid female found in a small stream on 02 August 1999. This location [42.1049°N, 87.8833°W (WGS84/NAD83) USGS **Arlington Heights** Quad] was visited on 12 October 2005. Suitable habitat was found north and south of the Rte 21 bridge over the Des Plaines River in backwater sloughs. There is a wide swath (~800 m) of developed land between I-294/94 and suitable habitat at this site making it unlikely that work within the 150 m corridor will affect the species at this location.

EO 4738: Southwest of Middlefork Savanna Preserve (Fig. 3, Plate 9).
This record is of an observation of an adult basking in a ditch near successional woods in 1994. This site [42.2531°N, 87.8933°W (WGS84/NAD83) USGS **Libertyville** Quad] was visited on 08 October and 16 October 2005. Numerous wetland types occur in the area including cattail marsh, sedge meadows, ephemeral woodland pools, and ponds. Potential habitat was found within 40 meters of I-294/94.

In 2005, VES were conducted for 1.5 man hours on 16 October and >10 Painted Turtles, *Chrysemys picta,* were observed basking in a large pond within Middlefork Savanna Nature Preserve. No Blanding's Turtles were observed. With the exception of two ponds in Middlefork Savanna Nature Preserve, all wetlands were dry and therefore un-trappable in 2005.

In 2006, hoop traps baited with canned sardines in oil were used to trap the site for a total of 200 trap nights and captured 9 Snapping Turtles, *Chelydra serpentina,* with one recapture and 30 Painted Turtles, two of which were recaptured. No Blanding's Turtles were captured or observed. Other wetlands within this area were sampled in 2004 as part of a survey for Blanding's Turtles on Lake County Forest Preserve properties (Kuhns et al., 2004). The study documented 3 Snapping Turtles, 13 Painted Turtles, and 1 Red-eared Slider *Trachemys scripta* captured in 41 trap nights (Kuhns et al., 2004).

Eastern Massasauga (*Sistrurus catenatus*). State Endangered (1994 listing date).

The Eastern Massasauga Rattlesnake is a small-bodied grey to light brown snake with a series of dark brown to black saddles across its dorsum, a dark stripe running backwards from the eye, and two dark stripes extending posteriorly from the head (Ernst & Ernst, 2003). Historically, Eastern Massasauga Rattlesnakes occurred in the northern two-thirds of the state excluding the northwestern unglaciated region of Illinois. The preferred habitat of this species is wet prairies, bogs, marshlands, old fields, and floodplain forests (Phillips et al., 1999; Smith, 1961). Eastern Massasauga Rattlesnakes are active from mid-March through early November with activity peaks in late April through June and late September and early October (Ernst & Ernst, 2003). In late fall, Eastern Massasauga Rattlesnakes seek out rodent and crayfish burrows for brumation (Tennant, 2003). Populations of this species have declined greatly in Illinois and only four populations are known to persist in the state (CAP, unpubl. data), one of which is within the I-294/94 corridor (Table 1, Figure 4).

EO 5070: Between the Des Plaines River and I-294/94 from Willow Rd. north to Deerfield Rd. (Fig. 5, Plate 10).
At least 10 observations of Eastern Massasauga Rattlesnakes are known from this location. Recent records include 06 September 2005 when one non-gravid female was observed at 1940 hrs along the main east-west path within the Forest Preserve

District of Cook County (FPDCC) property at the northwest corner of the intersection of Willow Road and Sanders Road (Anton, 2006). In 1992, a specimen was encountered dead on the shoulder of the IL 68/ I-294 interchange. Two locations (Willow-Sanders and Potawatomie Woods/Portwine South) within this EO number were searched in 2006. The Willow-Sanders site was included in a survey for the Eastern Massasauga Rattlesnake in the Chicago Region (Dreslik et al., 2006). Dreslik et al. (2006) reports a total of 42 encounters of 10 individuals in 134.3 search hours at this site. Of the 10 individuals, 4 were adult females, and 5 were juveniles (2M:3F). The lone adult male observed was found dead (Dreslik et al., 2006). The results of Willow-Sanders search effort by INHS staff given here were included in the Dreslik et al. (2006) report.

VES were conducted under favorable weather conditions (Casper et al., 2001), by slowly walking areas of suitable habitat and flipping tufts of grass and other potential cover objects when available. Low wet areas with an abundance of crayfish burrows were searched more intensively in the spring because of their potential to be used as hibernacula. Observed snakes were marked with PIT-tags, vertebral scale clips, and by uniquely painting rattle segments for future identification.

Willow-Sanders (Plate 10): This site was surveyed 16 days from 18 April through 16 June. To facilitate another project surveying for the Eastern Massasauga Rattlesnakes in northeastern Illinois, the site had been winter burned by the Forest Preserve District of Cook County. A total of 68 search hours resulted in 17 observations of 9 Eastern Massasauga Rattlesnakes. Additionally, searcherd documented 42 Plains Garter Snakes, 3 Brown Snakes, and 1 Common Garter Snakes (Table 3).

Potawatomie Woods/Portwine South (Plate 10): This site was surveyed on 31 August, 19 September, and 09 November for a total of 9.77 search hours. This site was not burned or visited in the spring but all other searching methods were as given above. No Eastern Massasauga Rattlesnakes were observed. We found 3 Redbelly Snakes, *Storeria occipitomaculata,* and 1 *Thamnophis* sp. (the individual was not captured so we are unsure whether it was Plains Garter Snakes or Common Garter Snakes).

SUMMARY/DISCUSSION

Iowa Darter (*Etheostoma exile*)

Historically there were 5 sites within the 1.6 km buffer of the I-294-94 corridor for the Iowa Darter. Surveys of these sites in 2005 and 2006 did not result in observations of Iowa Darters. However, because this species occurs in densely vegetated water-bodies, sampling can be difficult. Of the 5 historical sites, optimal habitat for this species remains only at Old School Lake (EO 4645) and we feel that there is a high likelihood that the Iowa Darter persists there. We recommend that every effort be taken to prevent the loss of habitat in Old School Lake. These efforts should include all measures

designed to limit silt inflow, particularly during the spawning season (late spring, early summer).

Blackchin Shiner (*Notropis heterodon*)
The Blackchin Shiner was documented within the corridor 39 years ago at the Rte 21 Bridge over the Des Plaines River (EO 6527). The turbid water now found in most reaches of the Des Plaines River likely accounts for the elimination of Blackchin Shiners from the entire river basin.

Kirtland's Snake (*Clonophis kirtlandii*)
Kirtland's Snakes have been documented from two sites within 1.6 km of the I-294/94 corridor. The Carle Woods site (EO 2382) is now marginal habitat for the species. While the Kirtland's Snake preferred habitat of open canopy and wet grassland remains, few crayfish burrows were found and it appears that the open canopy beneath the power lines is managed mowing. Further, this habitat is separated from the I-294/94 right-of-way by the Union Pacific Railroad, a mowed area, residential area, East River Road, and a sound barrier fence along I-294-94. It is unlikely that improvements on I-294/94 will have a negative affect on any remaining Kirtland's Snakes at this site.

The area in and immediately adjacent to the reported locality of the Kennicott's Grove sighting (EO 5122) no longer appears to be optimal Kirtland's Snake habitat. While wet areas persist, the habitat is now shrubby and there is little open canopy grassland habitat. Subsequent to our surveys, additional information placed the Kirtland's Snake sighting much closer to the I-294/94 corridor. This open grassland was visited on 30 November and suitable habitat for Kirtland's snakes does remain near the I-294 overpass of West Lake Ave. up to the I-294/94 embankment (Plate 8, black polygon). If improvements to I-294/94 will result in disturbance to the soil in this area, we recommend that the site be burned and searched prior to any habitat alteration at this site.

Blanding's Turtle (*Emydoidea blandingii*)
Based on aerial photographs and site visits in 2005, we found that only one of the two historical sites for Blanding's Turtles within the buffer would potentially be affected by improvements to I-294/94. The site between Sanders Road and Milwaukee Avenue, EO 322, is separated from I-294/94 by 800 m of unsuitable, developed land and it is unlikely that any improvements within the 150 m corridor would have a negative affect on Blanding's Turtles at the site.

Habitat around the Lake Forest Oasis, near Middlefork Savanna (EO 4738) appears suitable for Blanding's Turtles but, based on trapping results from this year and the 2004 survey, we feel it is unlikely that a population currently exists at this location. The possibility remains that a few Blanding's Turtles might intermittently occupy these areas. If individuals do occasionally utilize wetlands immediately east of the I-94 corridor, the chain link fence that separates the frontage road from suitable habitat will likely preclude Blanding's Turtles from entering the construction corridor.

Eastern Massasauga Rattlesnake (*Sistrurus catenatus*)
Numerous historical records for the Eastern Massasauga Rattlesnake occur within the I-294 corridor with most of the records occurring between Willow Road and Lake-Cook Road on West side of I-294. Surveys in these areas in 2006 documented nine Eastern Massasauga Rattlesnakes in the open area north of Willow Road (Dreslik et al., 2006). This was the only location in which Eastern Massasauga Rattlesnakes were found as part of a survey of the Chicago-land region (Dreslik et al., 2006). All encounters of snakes were separated from I-294 by Sanders Road and/or a housing subdivision. However, there are two open areas with suitable habitat for the Eastern Massasauga Rattlesnake that abut I-294 (Plate 10, sites are bordered by red crescents). Although, no snakes were documented in either of these open areas in 2006, their proximity to a known population of Eastern Massasauga Rattlesnakes warrants attention. If improvements to I-294 will result in alteration of habitat at either of these sites, we recommend that the sites be burned prior to snake emergence in the spring and surveyed immediately prior to disturbance.

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Table 1. Historical observation locations for Threatened and Endangered fishes, amphibians and reptiles within 1.6 km of the I-294/94 corridor in Lake and Cook counties from the Illinois-Wisconsin State Line to US Highway 41. The coordinates are given in DMS and are taken from the Illinois Natural Heritage Database.

EO	Species	Location	Latitude	Longitude
3730	*E. exile*	Mill Creek, 1 mi S of Wadsworth	42°25'08"N	87°57'07"W
4645	*E. exile*	SW int Rt 176 and 294; in Old School Forest Preserve; in Old School Lake	42°16'37"N	87°54'53"W
5592	*E. exile*	Beck Lake w/in FPDCC, ~ 2 mi WSW of Glenview Naval Air Station	42°04'25"N	87°52'15"W
3313	*E. exile*	West Fork North Branch Chicago River, W of Lake Forest	42°12'42"N	87°53'42"W
6334	*E. exile*	Sterling Lake	42°28'10"N	87°56'41"W
6527	*N. heterodon*	Des Plaines River at Il Rt 21 Bridge	42°06'03"N	87°53'06"W
2382	*C. kirtlandii*	Carle Woods, N of Big Bend Lake	42°03'35"N	87°52'31"W
5122	*C. kirtlandii*	Kennicott's Grove, W of Glenview	42°04'52"N	87°51'25"W
322	*E. blandingii*	Ditch on N shoulder of Winkleman Rd b/w Sanders Rd. and Milwaukee Ave.	42°05'45"N	87°52'60"W
4738	*E. blandingii*	Just SW of Middlefork Savanna Nature Preserve boundaries	42°15'08"N	87°53'27"W
5070	*S. catenatus*	North of Willow Rd., East of Wheeling	42°06'39"N	87°52'48"W
5070	*S. catenatus*	Dam1 - Willow/Sanders Prairie ~150 m from bridge over Willow Rd.	42°06'39"N	87°52'48"W
5070	*S. catenatus*	Ryerson Conservation area near Riverwood, South to Willow-Palatine Rd,	42°06'39"N	87°52'48"W
5070	*S. catenatus*	Northfield, E of Des Plaines R.	42°06'39"N	87°52'48"W

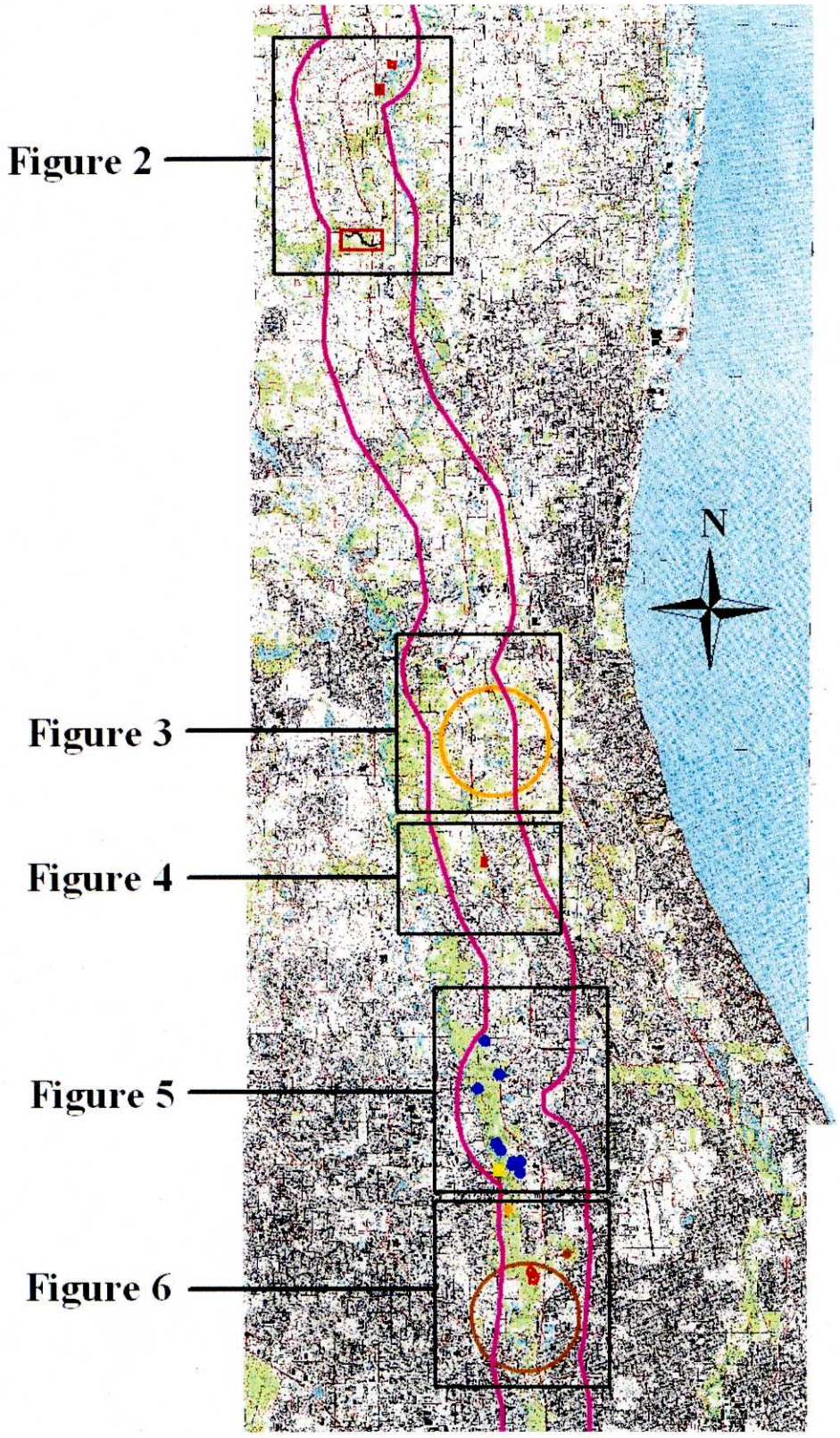
Table 2. Trapping results for EO 4738 in and around Middlefork Savanna Nature Preserve.

	2006 (200 trap nights)			2004 (41 trap nights)		
Species	Male	Female	Unknown	Male	Female	Unknown
Chrysemys picta	11	16	3	4	7	2
Chelydra serpentina	1	0	8	1	0	2
Trachemys scripta	0	0	0	1	0	0

Table 3. Search effort and captures for EO 5070 at Willow-Sanders. EMR = *Sistrurus catenatus*, CPU= catch per unit effort, THRA = *Thannophis radix*, STDE = *Storeria dekayii*, THSI = *Thamnophis sirtalis*

Date	Man Hours	EMR	CPU	Personnel	Other
4/18/2006	4.53	2	0.44	Redmer, Baker, Burger	THRA (7)
4/20/2006	7.10	5	0.70	Redmer, Baker, Burger	STDE (1), THRA (2)
4/23/2006	10.63	3	0.28	Redmer, Dreslik, Baker, Anton	STDE(1), THRA (7)
4/26/2006	3.25	1	0.31	Redmer, Dreslik, Baker	THRA (2)
4/27/2006	2.57	2	0.78	Dreslik, Phillips, Baker	THRA (4)
4/28/2006	8.02	0	0.00	Redmer, Dreslik, Baker, Anton	0
5/3/2006	4.68	2	0.43	Redmer, Dreslik, Baker, Scott	STDE (1), THRA (6)
5/8/2006	4.27	0	0.00	Baker, Anton	0
5/17/2006	2.83	0	0.00	Baker, Bradfield	THRA (3)
5/22/2006	1.90	1	0.53	Baker THRA (1)	
5/24/2006	3.37	1	0.30	Baker, Bradfield	THRA (1)
5/26/2006	0.97	0	0.00	Baker, Bradfield	0
5/31/2006	3.28	0	0.00	Baker, Bradfield	THSI (1), THRA (3)
6/5/2006	3.67	0	0.00	Baker, Bradfield, Anton	THRA (2)
6/12/2006	2.00	0	0.00	Baker, Bradfield	THRA (1)
6/14/2006	5.00	0	0.00	Baker, Dreslik, Anton, Schmidt, Bradfield	THRA (2)
Total:	**68.07**	**17**	**0.24**		

Figure 1. I-94/294 tollway improvement corridor in Cook and Lake counties showing locations of subsequent figures in relation to the overall corridor.



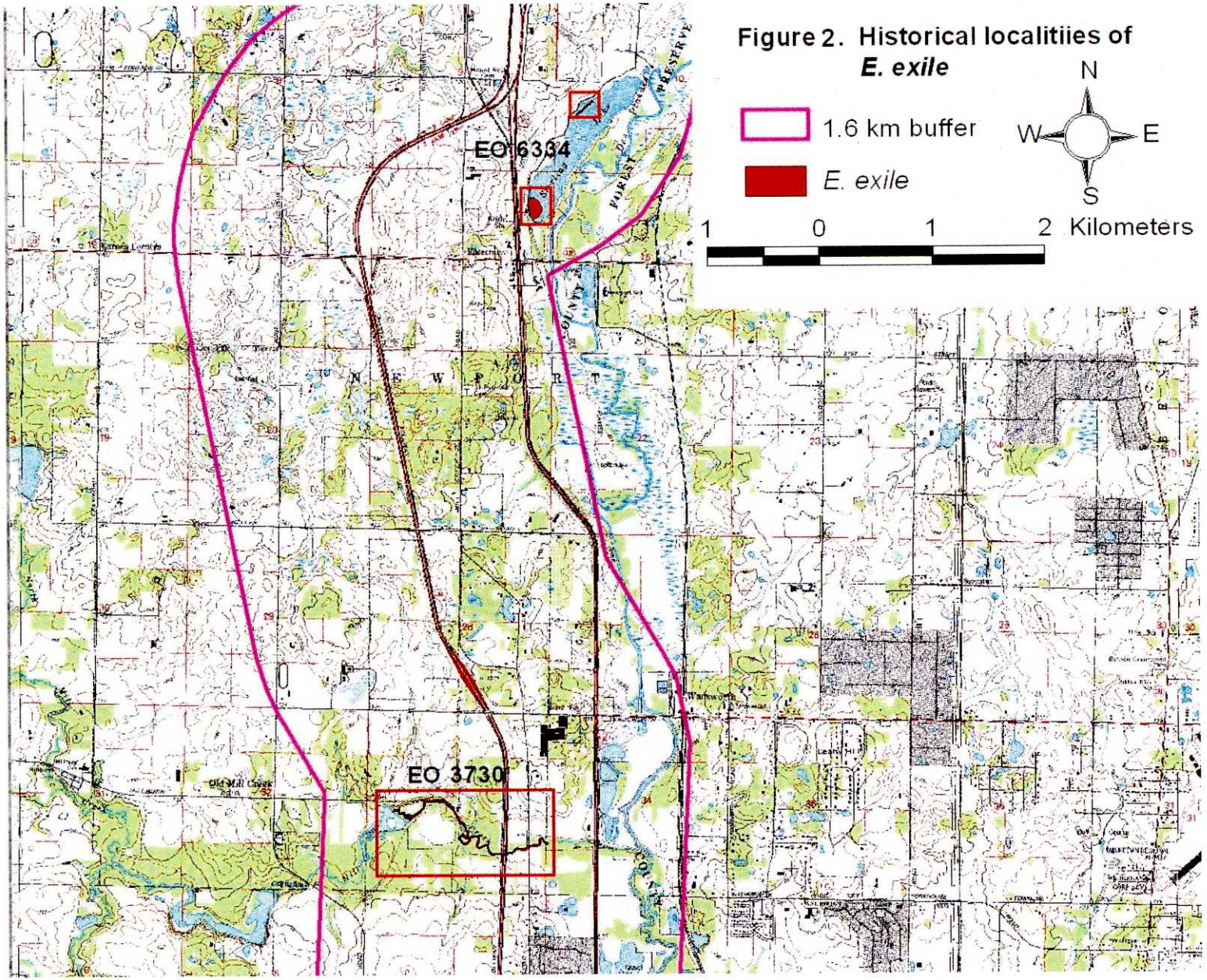


Figure 2. Historical localitiies of
E. exile
1.6 km buffer
E. exile
N
W
E
S
1
0
1
2 Kilometers
EO 6334
EO 3730

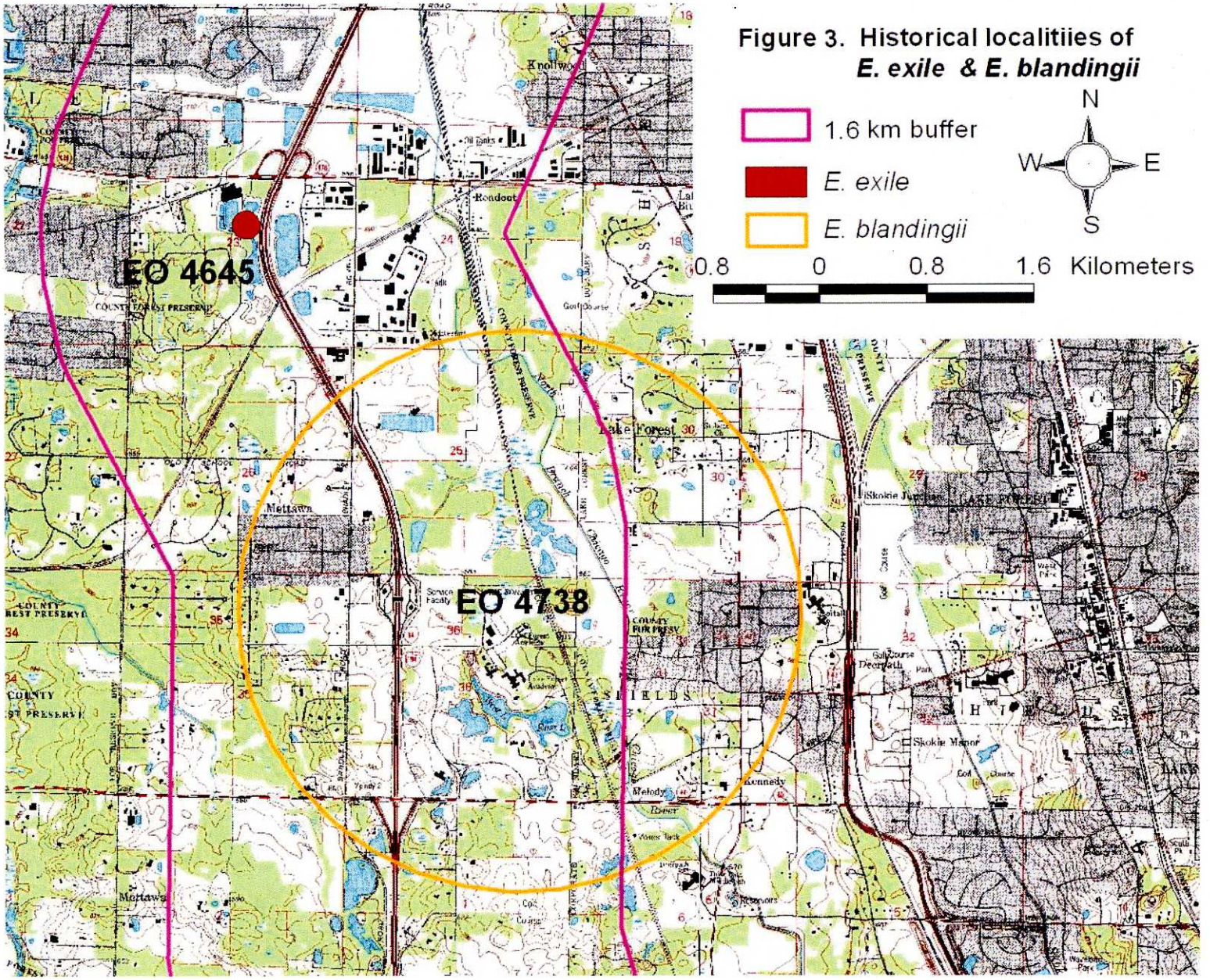
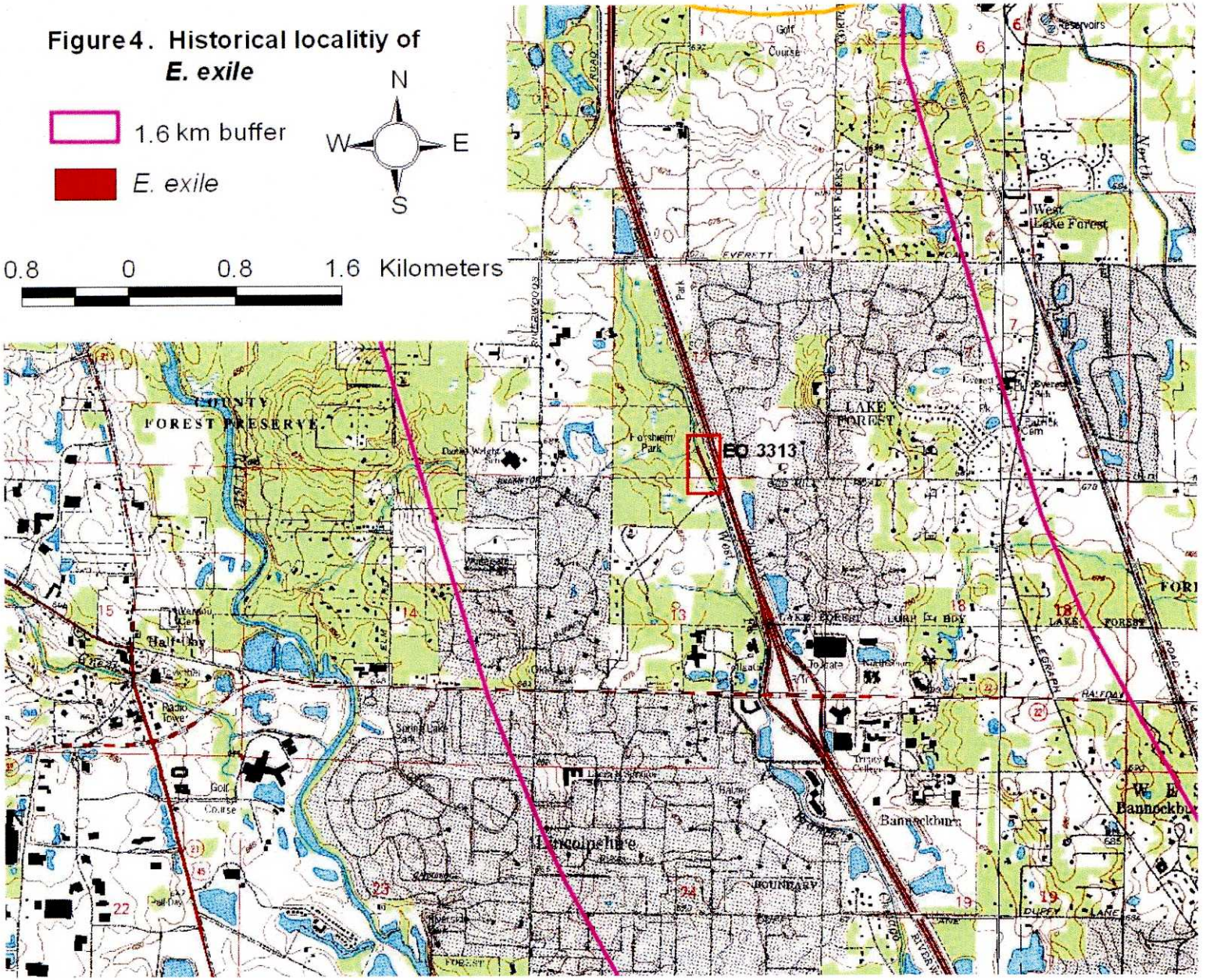


Figure 3. Historical localitiies of *E. exile* & *E. blandingii*

Figure 4. Historical localitiy of *E. exile*



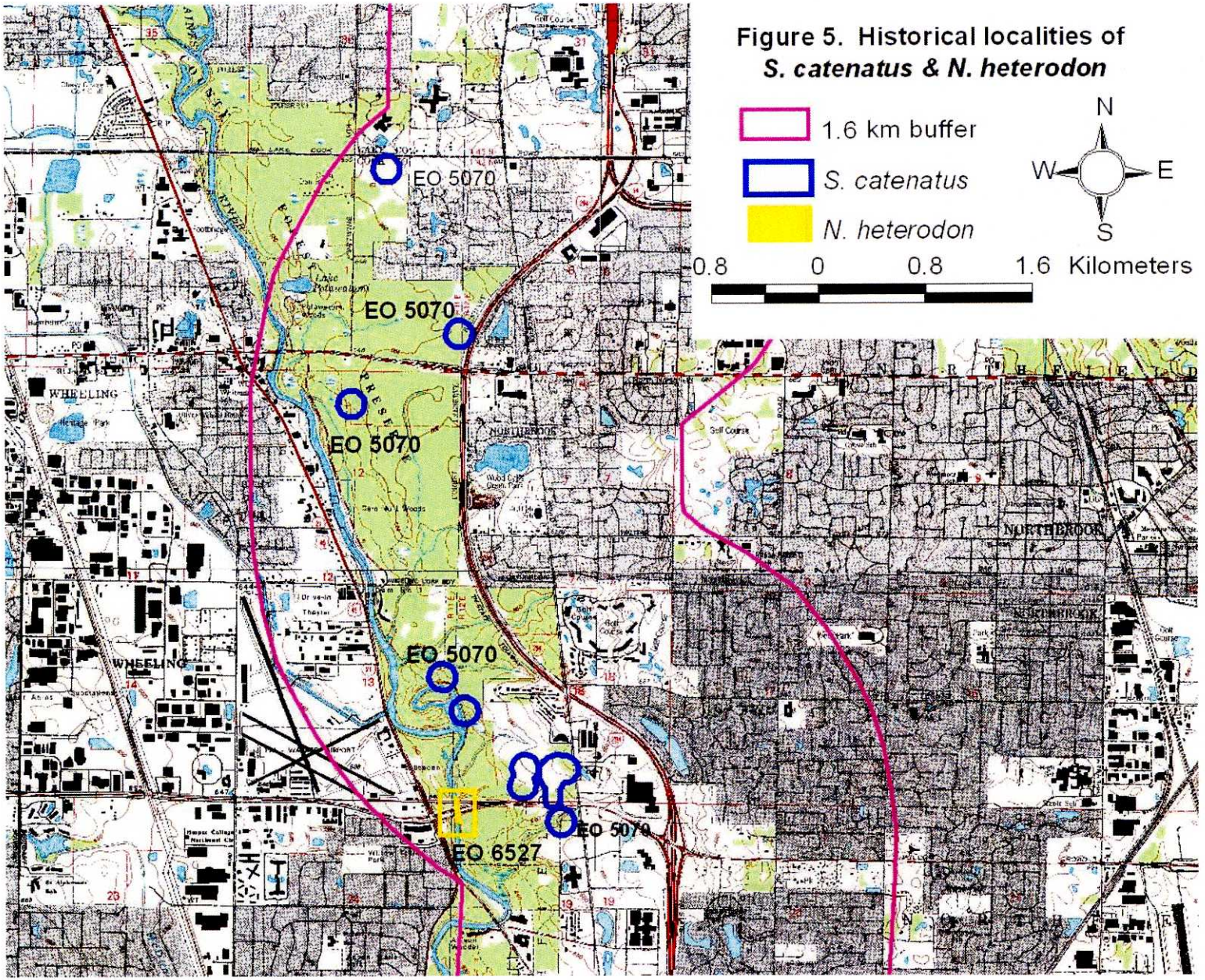


Figure 5. Historical localities of
S. catenatus & N. heterodon
1.6 km buffer
S. catenatus
N. heterodon
N
W
E
S
0.8
0
0.8
1.6 Kilometers
EO 5070
EO 5070
EO 5070
EO 5070
EO 5070
EO 6527
WHEELING
WHEELING
NORTHBROOK
NORTHBROOK

Figure 6. Historical localities of
E. exile, E. blandingii, & C. kirtlandii

1.6 km buffer

E. blandingii

E. exile

C. kirtlandii

N

W E

S

0.8 0 0.8 1.6 Kilometers

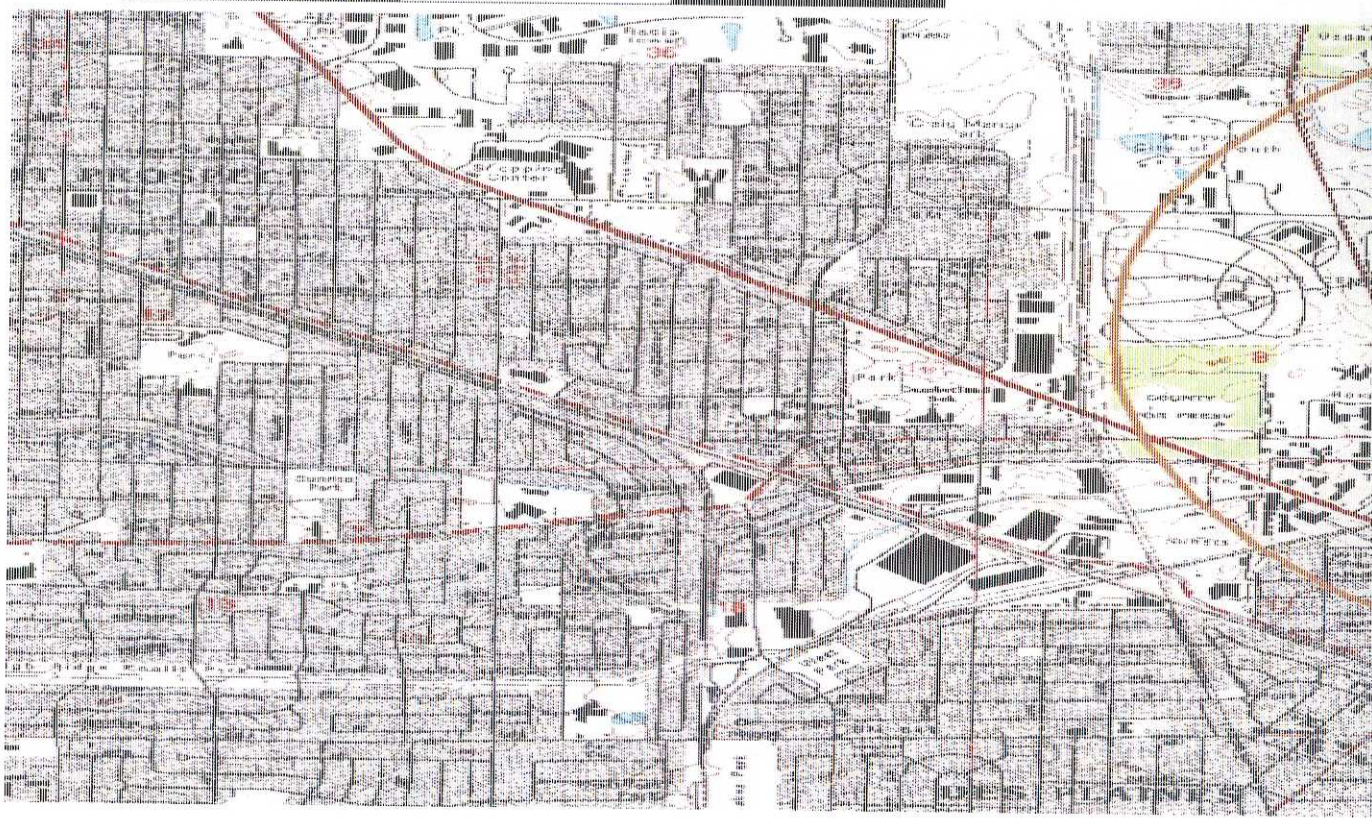


Plate 1. Aerial Photograph and photograph of representative habitat of EO 3730 Iowa Darter survey site at Mill Creek, showing proximity to I-94 and general habitat features. Mill Creek was sampled from the red marker west to where the creek flows under I-94.

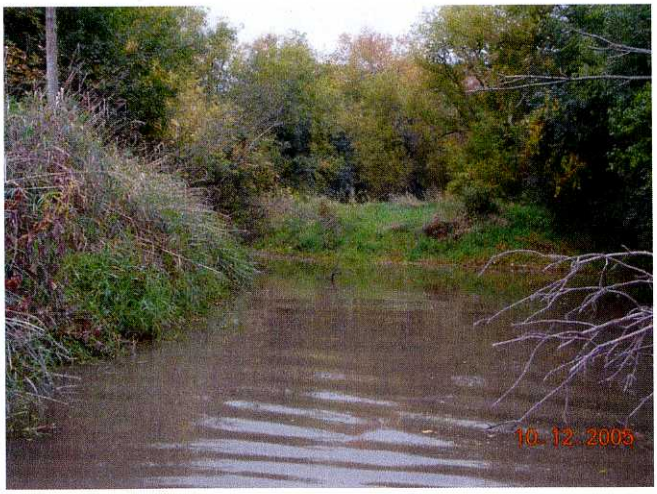


Plate 2. Aerial Photograph of EO 6334 Iowa Darter site at Sterling Lake, showing general habitat features and proximity to I-94.

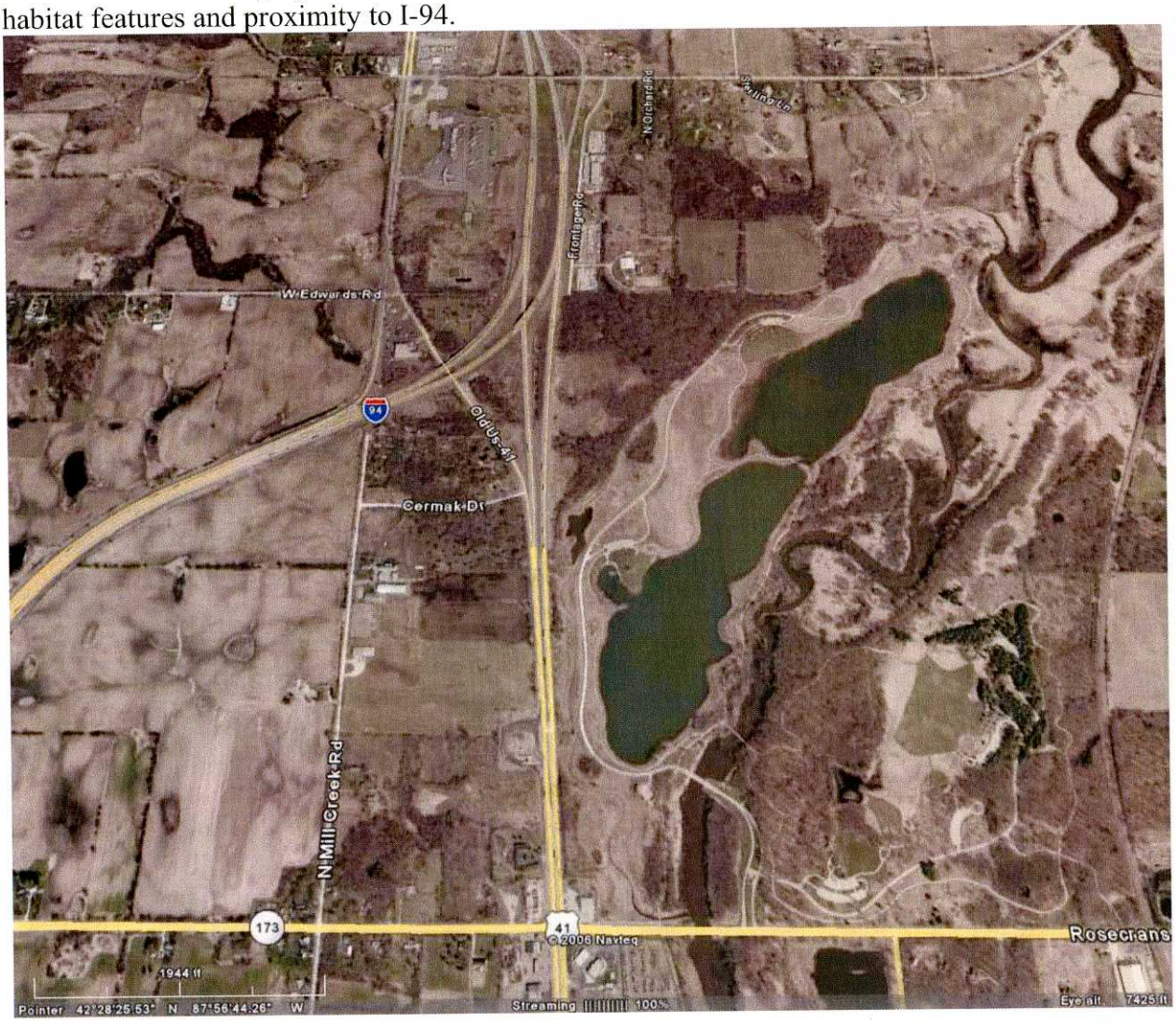


Plate 3. Aerial Photograph and photograph of representative habitat of EO 4645 Iowa Darter survey site at Old School Lake, showing surrounding habitat features and proximity to I-94. The southern third of the lake was sampled with a 10' minnow seine.

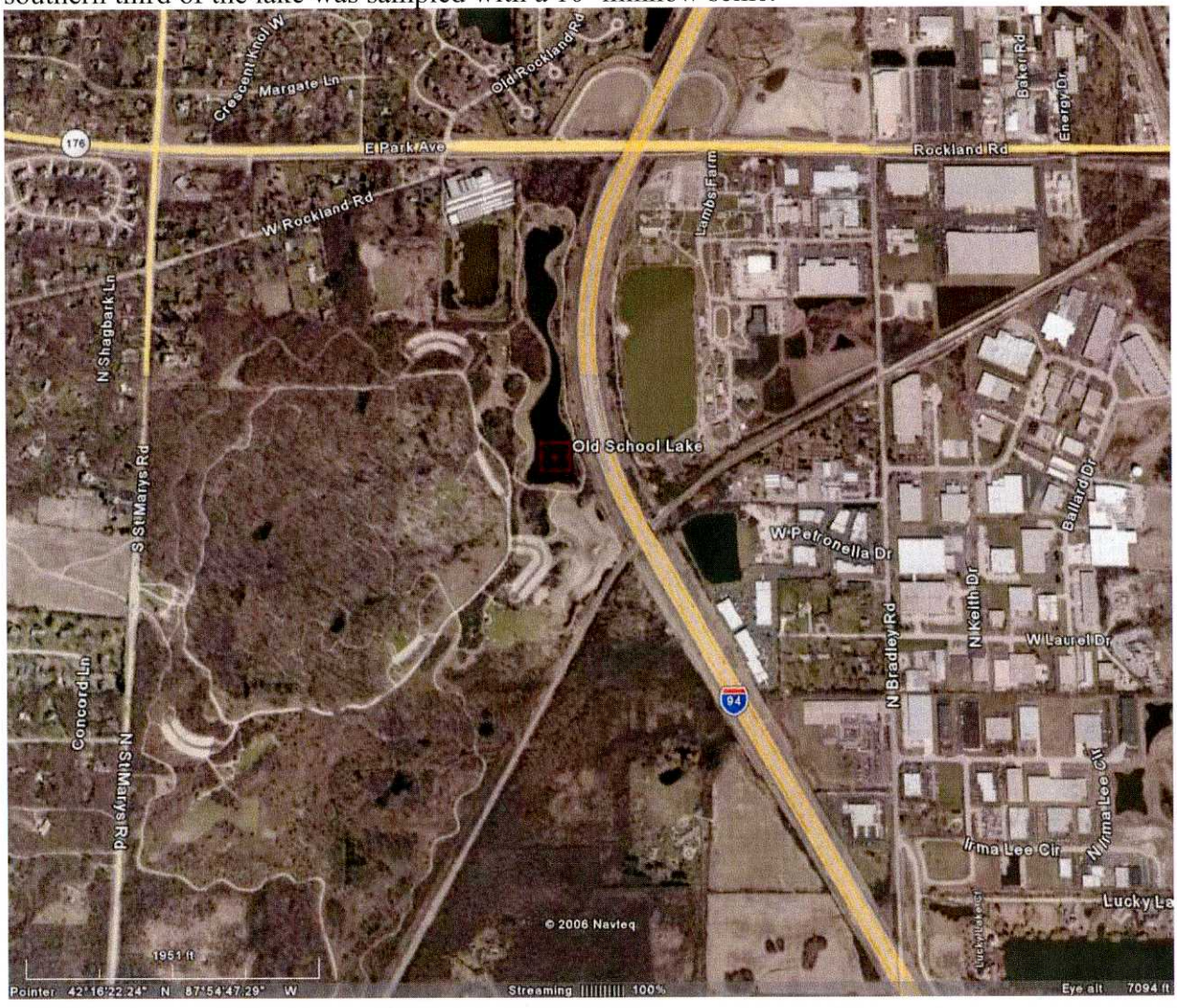


Plate 4. Aerial Photograph of representative habitat of EO 3313 Iowa Darter site on the West Fork, North Branch of the Chicago River, showing surrounding habitat and proximity to I-94. Approximately 100 meters of this reach were surveyed with a 10' seine.

Plate 5. Aerial Photograph and representative habitat photograph of EO 5592, Iowa Darter site at Beck Lake showing proximity to I-94 and general habitat features. We sampled the southern half of the West shore where aquatic vegetation was present. Photograph of dry shoreline during drought of 2005.

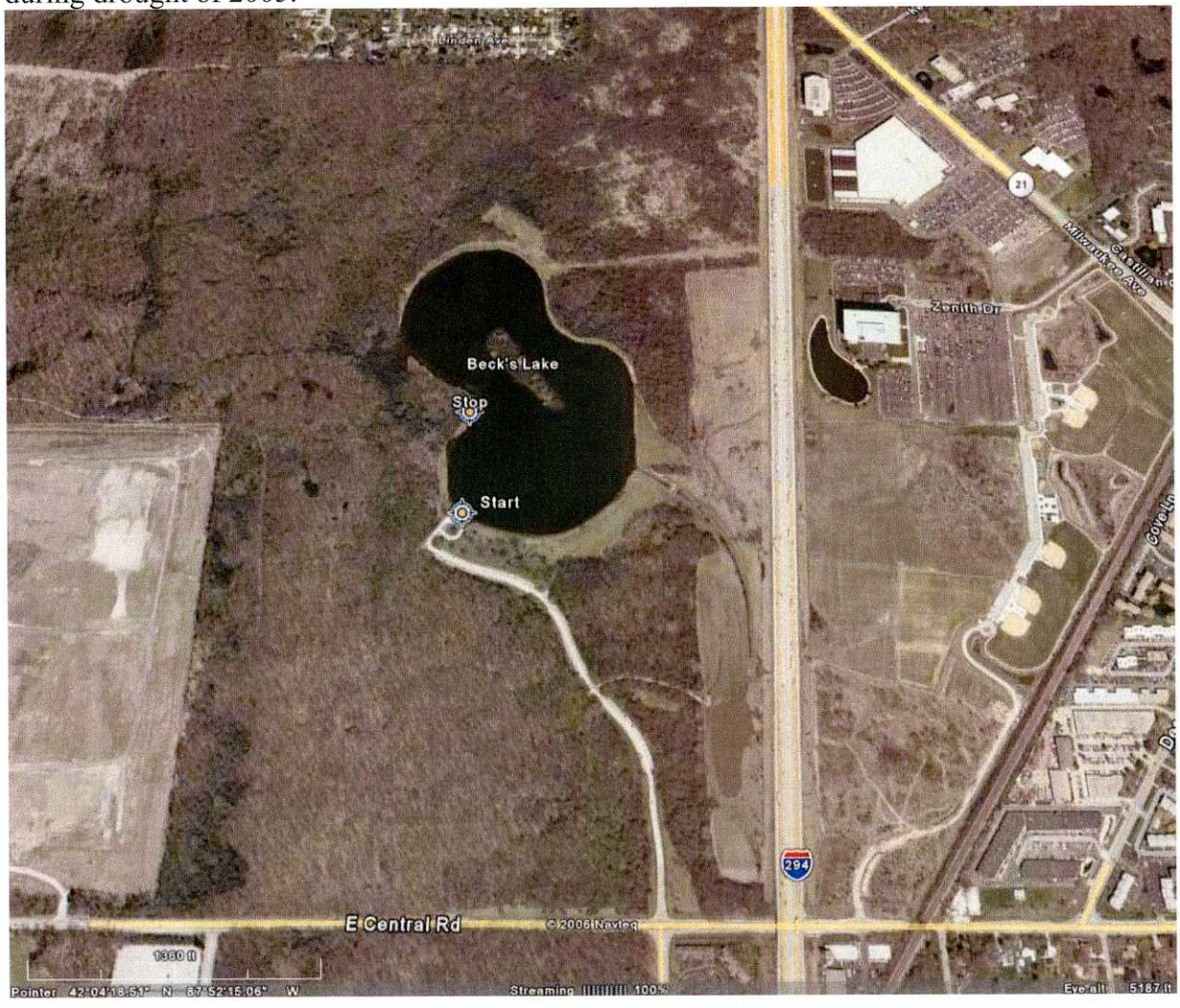


Plate 6. Aerial Photograph and habitat shot of EO 6527, Blackchin Shiner site at Route 21 Bridge over the Des Plaines River, and EO 322 Blanding's Turtle site at Winkleman Road showing proximity to Tollway and general habitat features. The Blackchin Shiner site was sampled with a 10' minnow seine from the Route 21 bridge to approximately 100m downstream.

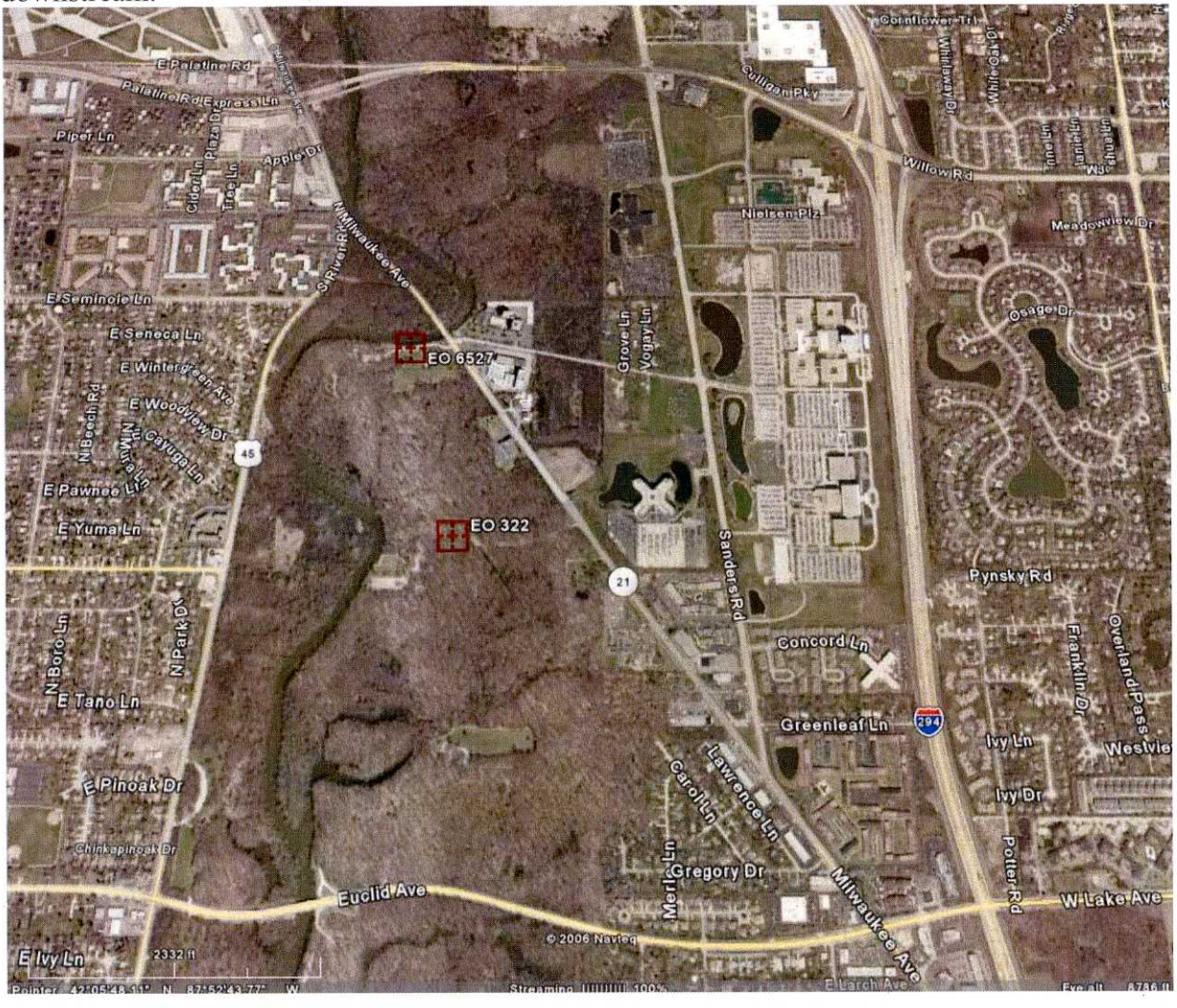


Plate 7. Aerial Photograph and photograph of representative habitat of EO 2382 Kirtland's snake survey site at Carle Woods showing approximate boundaries of searching and proximity to I-294.

Plate 8. Aerial view and photograph of typical surveyed habitat for EO 5122 Kirtland's Snake survey site in Kennicott's Grove. Suitable habitat was found within the black polygon near the intersection of West Lake Avenue and I-294.

Plate 9. Aerial photograph and representative habitat photograph of EO 4738 Blanding's Turtle site near Middlefork Savanna showing general trapping locations from 2004 and 2006.

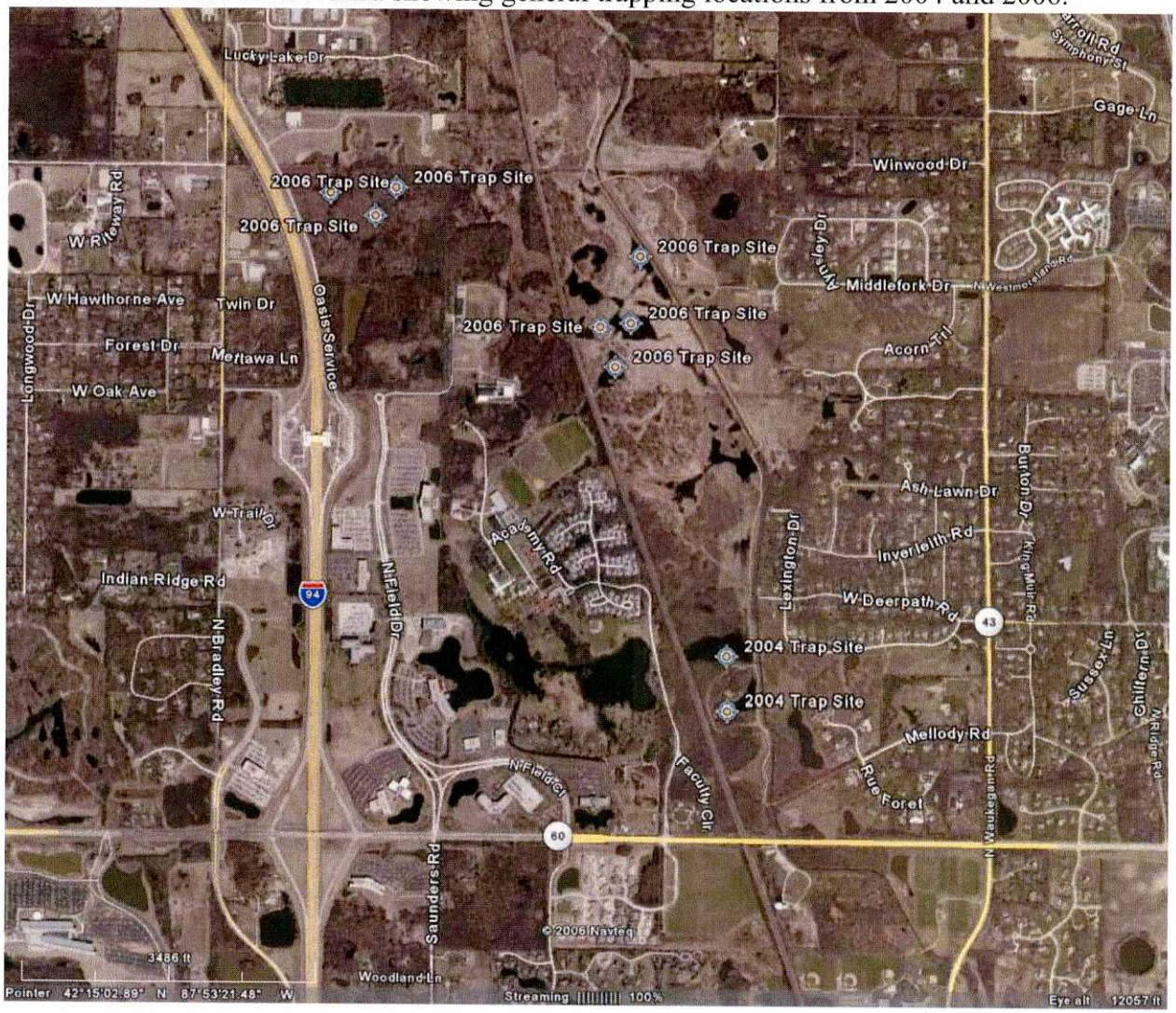


Plate 10. Aerial photograph showing multiple historic sightings of EO 5070 Eastern Massasauga Rattlesnakes (EMR) between Des Plaines River and I-294/94. Sites surveyed for this report are displayed boxed with crosshairs labeled as Willow-Sanders and Potawatomie/Portwine. Red crescents indicate areas where suitable habitat for EMR's adjoins I-294. Habitat shots below aerial are of the Potawotamie/Portwine site on the left and Willow-Sanders on the right.