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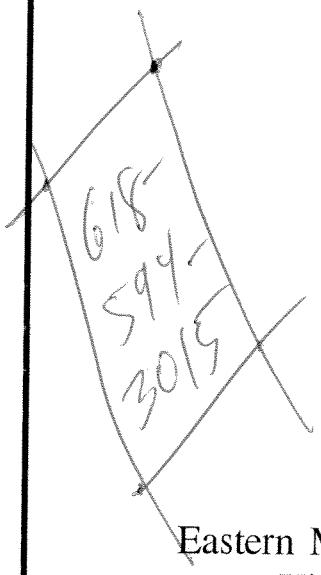

CONSERVATION PLAN

30 March 2007

Eastern Massasauga (*Sistrurus catenatus catenatus*)
Kirtland's Snake (*Clonophis kirtlandii*)

Strategy for Addressing Potential Impacts from Wal-Mart SuperCenter Development

Carlyle, Illinois, Clinton County

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PROJECT LOCATION

Northwest of the intersection of Illinois Route 127 and William Road

Carlyle, Clinton County, Illinois

Figure 1 – Topographic map for a graphic project ov erview

Figure 2 – Proposed site development plan

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INTRODUCTION

purpose The this Conservation Plan is to review the proposed Wal-Mart SuperCenter Development Project in sufficient detail to determine what extent the proposed action may result in "incidental take" of either of the Illinois state-listed endangered/threatened species listed below.

Target Species

Massasauga (Eastern *Sistrurus c. catenatus*)
Smooth Kirtland's *Clonophis kirtlandii*)

The site consists of portions of two parcels of land:

1. Parcel Number 08-07-12-400-004, which is currently owned by Weigman Motor Company and;

2. Parcel Number 08-07-12-400-005, which is currently owned by Carlyle Lake Crossings LLC

Wal-Mart proposes to purchase portions of the site parcels from the above identified parcel owners.

PROJECT DESCRIPTION AND ACTION AREA

The project is located in the northwest quadrant of the intersection of William Road and Illinois Route 127 in Carlyle, IL. Wal-Mart has proposed construction of a Wal-Mart SuperCenter on approximately 22.2 acres, north of the existing Wiegman Ford dealership. As part of the construction, a new public road known as Gateway Avenue will be constructed from Illinois 127 westward approximately 1,400 feet to provide access to the new SuperCenter, as well as the undeveloped property remaining to the west. Gateway Avenue will cross an unnamed riparian corridor tributary to Carlyle Lake. Approximately 480 feet of the riparian corridor will be disturbed by the road construction. Approximately 330 feet of riparian corridor located on the site and to the adjoining right of way east of the site will be left in its existing state.

The Carlyle Lake region is home to the largest remaining Illinois population of the endangered Eastern Massasauga (*Sistrurus c. catenatus*; Figure 3) and a known *S. c. catenatus* site lies only 0.75 km from the proposed development site. The only record of the Kirtland's Snake (*Clonophis kirtlandii*; Figure 4) in Clinton County, Illinois is an unvouchered specimen with the following location information: "near Carlyle Lake" (Bavetz, 1984).

The proximity of the proposed development site to a known *S. c. catenatus* site, the potential occurrence of *C. kirtlandii* in the area, and the fact that a riparian corridor is situated along the southern periphery of the site (which may provide suitable habitat for both *S. c. catenatus* and *C. kirtlandii*) prompted a habitat assessment survey which was conducted on 24 February 2007.

HABITAT ASSESSMENT

Prior to the field investigation, data sources were consulted to identify areas of potential habitat for each species included in this Conservation Plan. The sources include:

1:24,000 Scale Topographic Maps
Wetlands Delineation Arial Photographs at 1":500' scale taken in 1998, 1955, and 1938.

A habitat assessment survey was conducted by Mr. Ben Jellen on 24 February 2007 and consisted of walking the entire Wal-Mart SuperCenter proposed project area, with particular emphasis on the riparian corridor along the southern border of the site, was conducted to locate any potential habitat for the target species. No intensive species surveys for either of the target species were conducted during the habitat assessment. This assessment revealed the habitat structure of the proposed site to be predominately agricultural; however, a small amount of essential habitat for both *S. c. catenatus* and *C. kirtlandii* was encountered along the riparian corridor along the southern boundary of the proposed site (Figures 5, 6). Specifically, this mesic portion of the proposed site contained numerous crayfish burrows, which provide suitable overwintering refugium for *S. c. catenatus* and *C. kirtlandii* (Figure 6) and upland portions of the site contained

numerous rodent burrows (Figure 7), which serve as suitable foraging and gestating habitat for *S. c. catenatus*.

An automobile dealership is located to the adjoining south of the proposed site. Cultivated cropland is located to the adjoining west and north of the site and Illinois Route 127, McDonald's Restaurant and several residences are located to the east of the site. Due to the vegetative structure and the surrounding landscape (agricultural and commercial), the habitat quality at the proposed site is marginal.

Species Accounts

Sistrurus c. catenatus

Species Description

The Eastern Massasauga (*Sistrurus c. catenatus*) is a relatively small member of the pitviper subfamily (Crotalinae) with the largest Illinois specimen reaching 88.5 cm in total length (Smith 1961). Like all members of the genus *Sistrurus*, *S. c. catenatus* has nine large symmetrical plates on the top of its head. The dorsum is grey to light-brown and contains 29 – 40 light-edged, dark-brown saddles down the middle (Phillips et al. 1999) and three rows of smaller dark spots running along the laterals (Conant and Collins 1998). Some adults are melanistic black (likely alluding to one of its common names, "The Black Snapper"). One black head stripe extends from the posterior edge of each pit to the angle of jaw and two dark-brown head stripes extend from the top of the head onto the neck; sometimes extending a considerable length along the dorsum (H. Reinert pers. com.). The venter is heavily mottled with irregular white or yellow markings (Smith 1961, Phillips et al. 1999). The tail contains four to seven dark rings and, in young *S. catenatus*, is bright yellow (potentially to attract prey); however, gradually fades with age.

Behavior and Ecology

In Illinois, *S. c. catenatus* typically emerge from their hibernacula (including terrestrial crayfish burrows, rodent burrows, fissures, tree root systems and agricultural drainage tiles) in early April and, by early May, move to upland foraging habitats. Rodents are the chief prey of *S. c. catenatus*, but anecdotal reports of birds, eggs, frogs, lizards and snakes being taken have been reported. *Sistrurus c. catenatus* are primarily ambush predators and will remain at a potential foraging site for several days before abandoning it in favor of a new one. Females experience a biennial reproductive cycle (Aldridge et al. in press) and give birth from mid July through mid August (Jellen 2005). The mating season occurs from mid July – mid September (Jellen et al. in press), after which individuals locate suitable overwintering refugia. *Sistrurus c. catenatus* is a relatively docile snake, relying on camouflage to avoid confrontation. Chief predators include raptors, predatory mammals, other snakes (Phillips et al. 1999), and man. During the summer and fall harvest seasons, *S. c. catenatus* are frequently encountered in agricultural fields foraging on small rodents (Conant and Collins 1998) and are often bailed along with crops.

Habitat Requirements

Sistrurus c. catenatus ranges from central New York and southern Ontario southwestwardly to south-central Illinois. Throughout this range, *S. c. catenatus* inhabits a wide variety of habitats including coniferous forests, floodplain forests, peatlands, wetlands, fens, and mesic prairie grasslands (Conant and Collins 1998). Specific requisites are necessary for populations to persist, which, in Illinois, include overwintering refugium (typically terrestrial crayfish burrows), prey (typically rodents), and gestation sites (typically areas with sparse canopy cover.) Female *S. c. catenatus* typically use rodent burrows during gestation (BCJ pers. obs.) and it is thought that mammal burrows provide an ideal microhabitat for thermoregulation (Nallueau 1979), function as a retreat from predators (Keenlyne 1972, Klauber 1972, Brown 1982), and may provide neonates suitable overwintering refugium (Jellen and Kowalski in press).

Species Status in Action Area

Habitat degradation and human persecution have extirpated *S. c. catenatus* throughout much of its range, leaving only small populations isolated from one another by strong dispersal barriers (Greene and Campbell 1992, Reinert and Bushar 1992, Szymanski 1998). These factors have resulted in its consideration as a candidate species for federal protection under the United States Endangered Species Act of 1973 (U.S. Fish and Wildlife Service 1999). *Sistrurus c. catenatus* is listed as endangered in Illinois and the number of populations has steadily declined from 24 to eight or less (Figure 8; Phillips et al. 1999). The occurrence of *S. c. catenatus* in Clinton County, in particular the Carlyle Lake region, is well-documented (Dreslik 2005) and represents the largest remaining population within the state. The closest site known to contain *S. c. catenatus* (Governor's Run Golf Course) is only 0.75 km east of the Wal-Mart SuperCenter proposed site.

Clonophis kirtlandii

Species Description

Kirtland's snake (*Clonophis kirtlandii*) is a relatively small, nonvenomous, stout-bodied natracine snake. The genus is monotypic and no subspecies are recognized. The dorsal background coloration varies from gray to reddish-brown and is patterned with four rows of 44–57 dark brown to black quadrangular blotches giving the dorsum a checkerboard appearance (Wright and Wright 1957, Smith 1961, Wilsmann and Sellers 1988, Conant and Collins 1998, Phillips et al. 1999, Hulse et al. 2001). The head is dark, often black on top, and slightly wider than the neck. The cream colored chin and upper labial scales are succeeded by faded orange to bright red ventral scales which are distinctively marked with two rows of contrasting dark spots (Wright and Wright 1957, Smith 1961, Conant and Collins 1998, Phillips et al. 1999, Hulse et al. 2001). In some individuals, the middle of the belly may appear clear or mottled with gray (Wright and Wright 1957). Juvenile coloration is darker than that of adults and juveniles are less conspicuously blotched (Smith 1961, Phillips et al. 1999). Coloration typically fades and the patterning becomes more distinct with age (Smith 1961). Keeled dorsal scales typically occur in 17 rows at midbody, two rows of subcaudal scales are present and the anal plate is divided.

Behavior and Ecology

C. kirtlandii is one of the most rare and secretive North Americ an snake species and, consequently, little is known concerning its life h istory. A highly fossorial species, it seeks refuge in crayfish burrows or beneath logs an d surface debris by day and typically reserves surface activity for the nocturnal hours o r extremely mild and overcast days (Wright and Wright 1957, Phillips et al. 1999, Huls e et al. 2001). *Clonophis kirtlandii* is typically encountered in mesic habitats associated with crayfish burrows (Conant 1943, Minton 1972, Wilsmann and Sellers 1988, Hulse et al. 2001). Its diet consists primarily of earthworms, leeches and slugs (Atkinson 1901, Co nant 1938, Minton 1944, Conant and Collins 1998) but anecdotal reports of individu als feeding upon insects and crayfish have also been reported (Bavetz 1993, Thurow 1993). Earlier reports of minnows and amphibians being taken were dismissed by Tucker (1977). Upon encounter, individuals often become rigid and immobile, flattening their b odies but retreat to a nearby refugia when touched (Smith 1961, Conant and Collins 1998, Phillips et al. 1999, Hulse et al. 2001). The activity season for *C. kirtlandii* ranges from March to October with a peak of activity in April and May, likely coinciding with t he breeding season (Conant 1938).

Habitat Requirements

Clonophis kirtlandii is considered a prairie peninsula species (Conant 1 978). The bulk of its range occurs in the north-central Midwest an d extends from central Illinois eastward through Ohio and terminates with a large d isjunct area in western Pennsylvania. The southern limit occurs in northern Kentucky and the northern most populations are located in southern Michigan (Wright and Wright 195 7, Conant and Collins 1998, Hulse et al. 2001). It is considered a species of possib le occurrence in Missouri (Johnson 1987) and Wisconsin (Hoy 1883).

Clonophis kirtlandii is more commonly encountered in damp habitat remna nts and vacant lots in urban settings than in undeveloped areas (S mith 1961, Minton 1972, McCoy 1982, Conant and Collins 1998). Key habitats for *C. kirtlandii* consist primarily of open, wet areas in association with crayfish burrows includin g wet meadows and prairies, swamp-forest habitats, woodland clearings, and the grassy edges of waterways (Conant and Collins 1998, Phillips et al. 1999, Hulse et al. 20 01). On the range periphery, it may be found in more heavily wooded habitats (Conant 1943).

Sufficient data on the spatial ecology of *C. kirtlandii* is lacking and the dearth of encounters prevents an accurate determination of ac tivity patterns and/or seasonal requirements (Genoways and Brenner 1985, Hulse et al. 2001). However, throughout the active season, *C. kirtlandii* is nearly always associated with crayfish burrows. It is not known if these burrows are also used solely for hib ernation or if relatively short seasonal movements occur; however, the relatively large numb er of individuals struck by vehicles suggest seasonal movements (Minton 1972).

Earthworms constitute the largest percentage of the diet of *C. kirtlandii* (Harding 1997, Phillips et al. 1999) and a reduction of their numb ers could pose a serious threat to *C. kirtlandii* populations. Earthworm abundance, biomass and biodiversity are negatively affected by soil pollutants (Spurgeon and Hopkin 1999) including herbicides and

pesticides. Competition with other earthworm speci alists, such as the Eastern Garter Snake (*Thamnophis sirtalis*), the Northern Brown Snake (*Storeria dekayi*), and the Northern Redbelly Snake (*S. occipitomacul ata*), is another possible threat (Harding 1997) but direct evidence of interspecific competition is lacking. Potential predators of *C. kirtlandii* include other snakes, birds, carnivorous mammals, fish, and humans (Wilsmann and Sellers 1988, Harding 1997), however the highly fossorial lifestyle likely limits predation. Vehicular traffic can be a large source of mortality as well (Minton 1972, Bavetz 1993, Harding 1997). Land-management practi ces, such as prescribed burning and mowing, can negatively affect populations if pr eformed when snakes are likely to be above ground (Bavetz 1993). Because crayfish burro ws are an integral component to the life history of *C. kirtlandii*, their loss could also constitute a major threat (Tucker 1994, Phillips et al. 1999). Other threats include disea se, long-term climatic changes and individuals being taken from the wild by unscrupulo us collectors (Harding 1997).

Species Status in Action Area

Clonophis kirtlandii is considered imperiled throughout its range and i s threatened with extinction in Illinois (Figure 9; Phillips et al., 1999). Once known from 23 Illinois counties, *C. kirtlandii* currently occupies only 11 (Illinois Natural Herit age Database 2003). Historically in Clinton County, Illinois, *C. kirtlandii* is known from one unvouchered specimen presented to Dr. R. A. Brandon in June 1971 with the only location information being "near Carlyle Lake" (Bav etz, 1984). Unsuccessful surveys for *C. kirtlandii* were conducted by Bavetz (1993) at four localities in the Carlyle Lake region, including Eldon Hazlett State Park located approximately 6 km northeast of the Super Wal-Mart proposed site.

EFFECTS OF PROPOSED ACTIONS

Direct effects on habitat

A riparian corridor, which includes an intermittent stream, is situated along the southern border of the site. This project will result in th e loss of 0.19 acres of potential marginal quality *S. c. catenatus* and *C. kirtlandii* habitat. The habitat loss will occur as a result of the proposed construction of an access roadway (Gat eway Avenue) to the proposed site from William Road to the adjoining south/southeast of the site.

The direct effects on habitat are two-fold:

1) Direct construction-rel ated effects and,

2) Effects of long-term essential habitat loss. T ake may occur through direct mortality of individuals and indirectly by negative ly altering essential habitats.

Incidental Take

The incidental take may occur through direct constr uction-related mortality, vehicular-related mortality along the proposed "Gateway Avenu e", and/or through indirect mortality as a result of essential habitat loss (0. 19 acres) and general habitat degradation. However, because of the negative results of the org anismal surveys, (on days/times

coinciding with positive organismal surveys by the Illinois Natural History Survey (INHS) personnel; Table 1), the relatively small amount of marginal quality habitat present on the site, and context of the surrounding landscape, we believe the potential for incidental take as a result of the proposed project is relatively low.

Measures to minimize the effects of the proposed action

Organismal Survey Measures

In order to conserve the target species, a series of organismal surveys are currently being conducted with the directive to collect any individuals of the target species and transport them to the Saint Louis Zoological Park for their incorporation into captive breeding programs to preserve their valuable and potentially unique genetic material.

Organismal surveys are being conducted during the spring egress period, under appropriate weather conditions, and on days and times coinciding with INHS personnel organismal surveys for *S. c. catenatus* in the Carlyle Lake region. An initial organismal survey was conducted on 21 March before vegetation was removed by weed eaters on the mild morning of 22 March 2007. Additional organismal surveys were conducted on 24 and 25 March (thus far totaling 6.5 person-hours) and two more such surveys will be conducted (Table 1). To date, neither of the target species have been encountered on the proposed site during the organismal surveys. Survey methods included walking the entire site, paying particular attention to the riparian area along the southern border, turning thatch cover and other surface debris for *C. kirtlandii*, and illuminating crayfish burrows to potentially view *S. c. catenatus* and *C. kirtlandii* that were not yet above ground.

Engineering Measures

The following impact minimization measures have been made part of the construction plans:

1. The Gateway Avenue alignment has been adjusted so it will only cross the riparian corridor once instead of three times as originally planned.

2. Consideration is underway to relocate the temporary construction access north of the property to eliminate it from crossing the riparian corridor. No habitat for target species was identified in the area of a north temporary construction during the Habitat Assessment.

3. The remaining 330 feet of riparian corridor from the Gateway Avenue crossing to Illinois 127 will be left undisturbed and in its natural state.

4. Construction activity in the riparian corridor will be limited to occur outside the spring egress period (late March to early April) of the target species.

5. During the construction phase, toed-in temporary silt fencing will be placed along the top perimeter of the undisturbed riparian corridor to impede movement of the target species into the construction zone.

6. During the construction phase, the area along the riparian corridor and the upland pad area will be kept clear of vegetative cover to decrease the likelihood that the species in question would move into the site because of increased risks (i.e., increased exposure during movement).

Additional Measures

The following impact minimization measures were considered, but were not incorporated into the construction plans.

1. Relocate the proposed development to another site – This site is within the city of Carlyle city limits, is zoned for business use, is in an existing Tax increment Financing (TIF) district, and has existing potable water, sanitary sewer, electric, telephone and gas utilities on the site. It is being actively marketed by the owner and the city for business development. A state highway provides access to the site, with adequate capacity. This is the most suitable site fore the Wal-Mart SuperCenter, and will easily support a business development, whether a SuperCenter or another business development. In addition, there are already existing commercial developments on adjacent property to the south (Weigman Ford dealership and a motel) and to the east (McDonalds Restaurant).

2. Relocate the proposed entrance to avoid the riparian corridor – Illinois 127, the state highway that provides public access to the site, is an access controlled highway for the entire frontage width of the site except for the break in access for William Road. This break in access is south of the riparian corridor, with the development site north of the riparian corridor. An alternate permanent access point to the site was evaluated, but none are available to the site from IL 127 due to Illinois Department of Transportation (IDOT) Access Control restrictions on IL 127. IDOT is the jurisdictional approval agency for access. The only available access point to IL127 from the subject parcel is across the riparian corridor. This location is acceptable to both IDOT and the city of Carlyle. The crossing of the riparian corridor is therefore unavoidable with development of the site.

3. Cross the riparian corridor at a 90-degree angle to shorten the impact – The proposed crossing is at a shallow angle, and results in about 480 feet of impact to the riparian corridor. Consideration was given to changing the crossing angle to something closer to 90-degrees by adding reverse curves, but there is no acceptable horizontal curve geometry to minimize the impact length while staying on the parcel that is being offered for sale by the owner and still

allowing the proper room for the proposed developme nt, and while providing acceptable and safe geometric alignment for the pro posed roadway.

4. Provide a bridge in lieu of a double box culvert fo r the proposed road crossing of the riparian corridor – Constructing a bridge wo uld require raising the site an additional several feet in order to provide mini mal clearance under the proposed bridge and the existing riparian corridor. While substituting a bridge for the box culvert may leave the stream intact, th e canopy of the bridge may also effectively degrade the habitat. In addition, the cost of the bridge would be considerably more than the proposed culvert. Wh ether done by Wal-Mart or another business development, the economics of t he site development costs have to be able to make business sense for an accep table rate of return model for the proposed development. The additional cost of the bridge and site fill would not be economically feasible for this develop ment, especially in comparison to the unlikely mitigation benefit to be gained.

Measures to mitigate the effects of the proposed action

To reduce the potential endangered/threa tened snake species in the project area, the organismal survey is being conducted duri ng the spring egress. If individual of the subject species are encountered during the surv eys, or during the construction process (see Monitoring section below), they will be collec ted and transported by appropriate personnel to the St. Louis Zoological Park for inco rporation into a captive breeding program.

Monitoring

On-site personnel will be made aware of the possibility of the target snake species inhabiting the site. Wal-Mart propos es that responsible on-site personnel will be designated to contact Illinois Department of Resources (IDNR) and/or U.S. Army Corps of Engineers (USACOE) representatives, should either of the target species be identified on the site during construction. The ID NR or USACOE representative who collects the individual, if present, will submit th e individual for incorporation into a captive breeding program at the Saint Louis Zoologi cal Park.

Wal-Mart Personnel will also be made aware of the potential existence of snakes on the site and will be trained to be observant of any dec eased snakes and report same to management personnel for evaluation, and to facilit ate relocation of any live snakes in accordance with the procedures noted above.

Conclusions And Effects Determinations

Because of the negative results of the organismal s urveys, (on days/times coinciding with positive organismal surveys by INHS personnel), the small amount of marginal quality habitat present on the site, and context of the sur rounding landscape, we believe this proposed action will not reduce the likelihood of t he survival of *S. c. catenatus* and/or *C. kirtlandii* in the wild within the state of Illinois.

IMPLEMENTING AGREEMENT

Names and Signatures of Participating Parties/Oblig ations and Responsibilities of Parties

Schedule

to bid Out

3 – 4 Weeks later

mobilize, set up on the site erosion co ntrols, and certify erosion is protection (2-3 weeks)

building Begin site grading – next 6-8 we eks (weather dependent)

building Begin construction, install on-site utili ties

on-site Complete improvements

off-site Complete improvements – (concurrent with on-site work)

The construction period is generally about nine mon ths from award to possession

OTHER PERMITS

has Applied for a 404/401 Joint Applicati on from the USACOE and the Environmental Protection Agency (IEPA)

has Applied for and has obtained approval from the City of Carlyle to the on-site stream with the proposed Gateway Avenue

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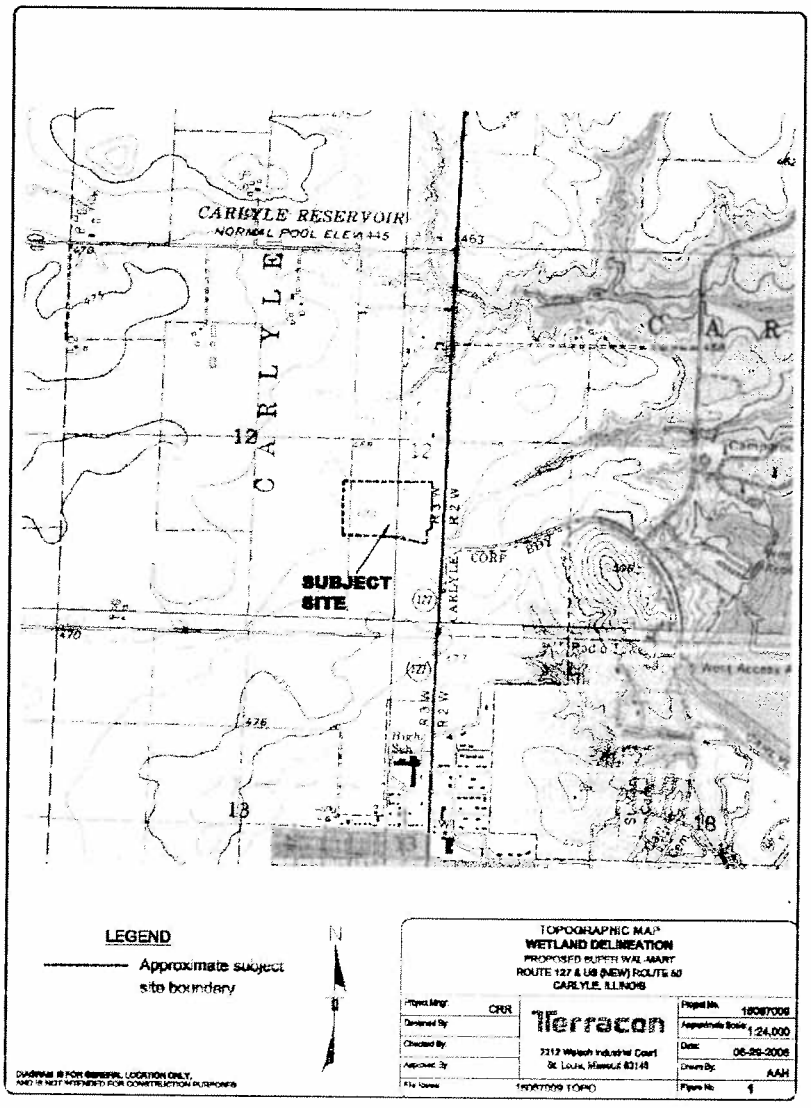
Table 1: Date, time, number of person-hours searched, shaded air temperature (ûC), air humidity (%), substrate temperature (ûC), substrate humidity (%), average wind velocity (m/s), cloud cover (0 = 0%, 1 = 1 – 25%, 2 = 26 – 50%, 3 = 51 – 75%, 4 = 76 – 100%), precipitation, number and type of herptile species encountered on the proposed site (Carlyle Lake, Illinois), and Illinois Natural History Survey personnel *Sistrurus c. catenatus* organismal survey results conducted during the same time interval as the proposed site organismal surveys. Note: *Thamnophis sirtalis* = Eastern Garter Snake, *Sistrurus c. catenatus* = Eastern Massasauga, *Bufo americanus* = American Toad.

Date	Person-	Species	Time	Precip.	Encountered (on-site)	NHS Results (off-site)	Air
3/21/07	– 16:02			ne	*T. sirtalis* 13:32	2 *S. c. catenatus*	
3/24/07	– 15:05				2 *T. sirtalis* 13:05 *B. americanus*	3 *S. c. catenatus*	
3/25/07	– 13:11				None 11:11	2 *S. c. catenatus*	
4/XX/07							
4/XX/07							
TOTAL							

Figure 1: Topographic map of project location



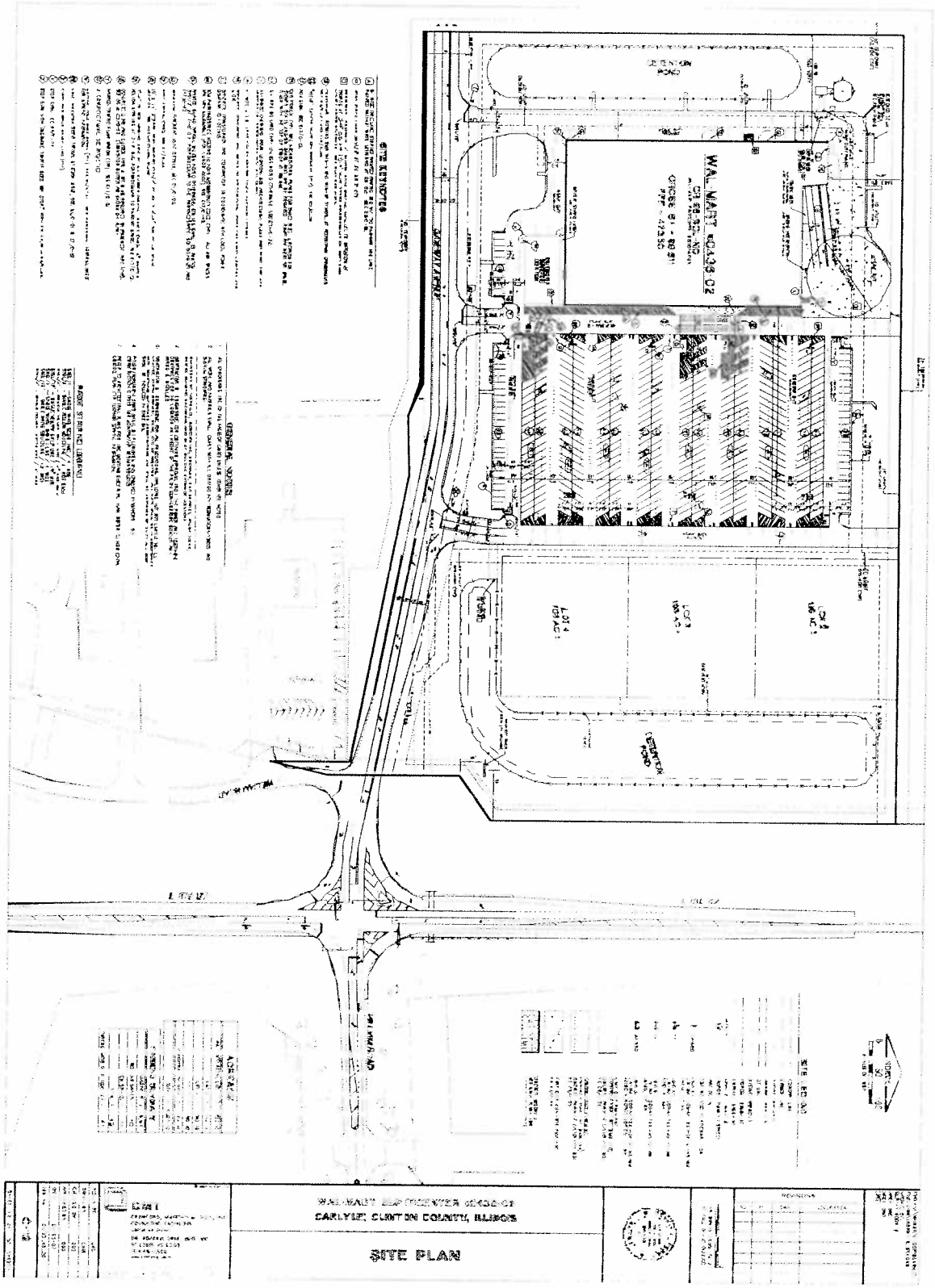

WAL-MART #0436-02
CARLYLE, CLINTON COUNTY, ILLINOIS
SITE PLAN

Figure 3: Photograph of *Sistrurus c. catenatus* by Benjamin C. Jellen

Figure 4: Photograph of *Clonophis kirtlandii* by Michael Redmer©/mikeredm er.com

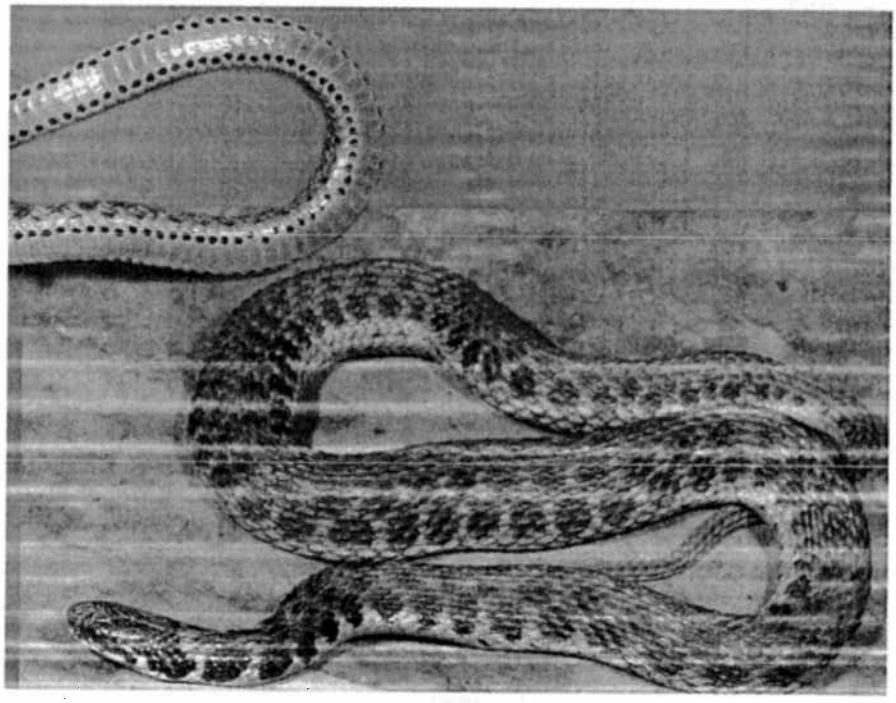


Figure 5: Photograph of suitable habitat for *Sistrurus c. catenatus* and *Clonophis kirtlandii* along riparian corridor of Super Wal-Mart proposed site (Carlyle, Clinton County, Illinois). Photograph taken 24 February 2007.

Figure 6: Photograph of one of numerous terrestria l crayfish burrows, suitable overwintering habitat for *Sistrurus c. catenatus* and *Clonophis kirtlandii*, encountered along riparian corridor or mesic, low-lying portion of Super Wal-Mart proposed site (Carlyle, Clinton County, Illinois). Photograph ta ken 24 February 2007.

Figure 7: Photograph of one of numerous rodent mou nds, suitable foraging and gestating habitat for *Sistrurus c. catenatus*, encountered in agricultural field at Super Wal-Ma rt proposed site (Carlyle, Clinton County, Illinois). Photograph taken 24 February 2007.

Figure 8: Illinois distribution of *Sistrurus c. catenatus* (Phillips et al., 1999).

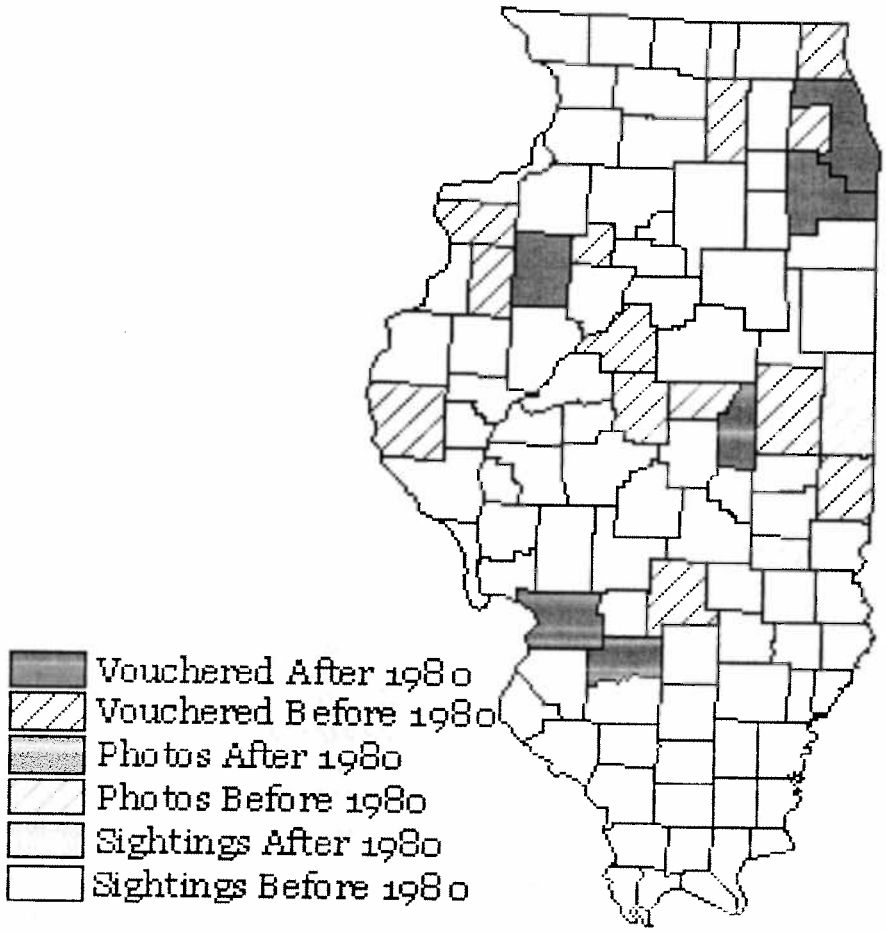
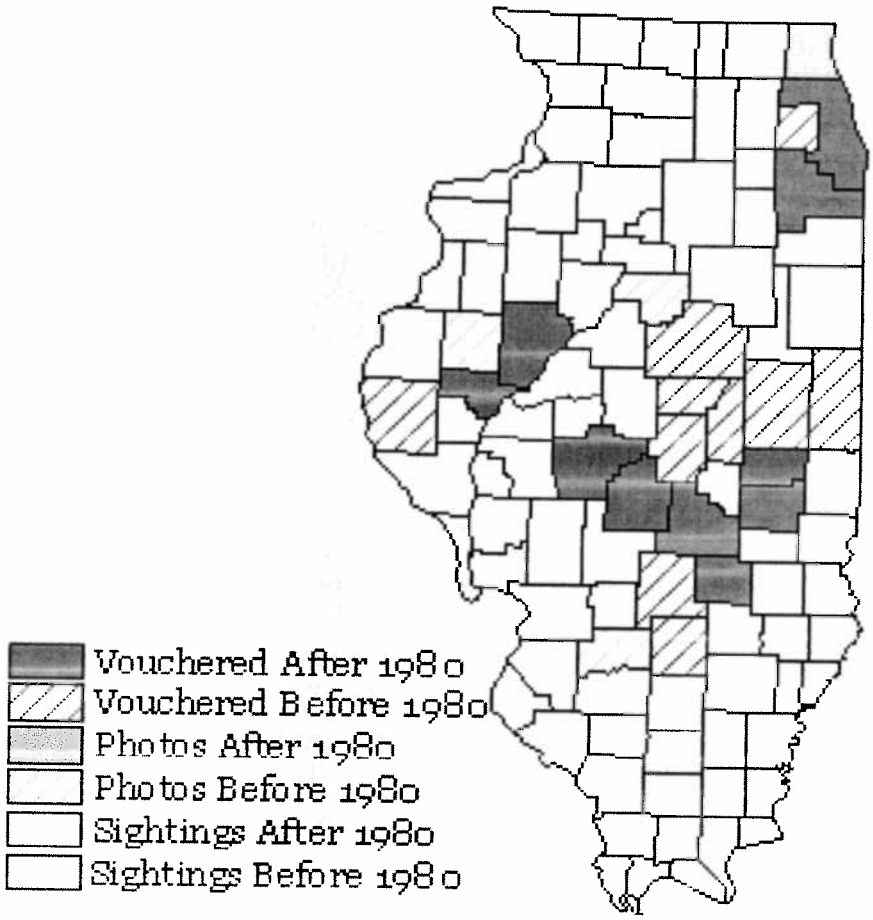



Figure 9: Illinois distribution of *Clonophis kirtlandii* (Phillips et al., 1999).