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**ASSESSMENT OF HABITAT FOR EASTERN MASSASAUGA AND
WESTERN FOX SNAKE WITHIN THE
PROPOSED KEYSTONE PIPELINE IN MISSOURI**

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EXECUTIVE SUMMARY

BHE Environmental, Inc. (BHE) was contracted by ENSR Corporation (ENSR) on behalf of TransCanada Corporation and their prime contractor Trow Associates Inc., to assess habitat for protected snake species along the Keystone pipeline in Missouri. A study plan dated October 16, 2006 describing methods for the assessment was approved by the Missouri department of Conservation. BHE evaluated 78 wetland sites in four counties on the Keystone pipeline corridor which had been identified during remote assessment as potentially containing habitat suitable for eastern massasaugas and western fox snakes. Of the 78 sites assessed, six were not evaluated due to site access restrictions, 43 were categorized as *not likely to support* the protected snakes, and 29 were categorized as *likely to support*.

1.0 INTRODUCTION

TransCanada is planning to construct and operate an approximately 1,845-mile-long interstate crude oil transmission system from an oil supply hub near Hardisty, Alberta, Canada to destinations in the Midwestern United States (U.S.). The proposed project would consist of approximately 1,078 miles of new pipeline constructed from the U.S.-Canada border in Cavalier County, North Dakota, to terminals and refineries in Wood River (Madison County) and Patoka (Marion County), Illinois. This pipeline is referred to as the Keystone Mainline. Approximately 283 miles of the Keystone Mainline would parallel the proposed Rockies Express Pipeline - West (REX-West) project in Kansas and Missouri. TransCanada proposes to begin construction of the Keystone Mainline in early 2008, with the system in-service by the end of 2009.

This report addresses an assessment of habitat suitable for two state-protected snake species, as described in a study plan dated October 16, 2006 (BHE 2006). During preliminary discussions, the Missouri Department of Conservation (MDC) indicated Buchanan, Carroll, Chariton, and St. Charles counties in Missouri which are crossed by the Keystone Mainline may potentially contain habitat suitable for the eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*) and the western fox snake (*Elaphe vulpina vulpina*).

BHE Environmental, Inc. (BHE) assessed 78 wetland areas in Buchanan, Carroll, Chariton, and St. Charles counties, Missouri, where potential habitat may exist for these species within the Keystone Mainline corridor (Table 1). Of the 78 sites assessed, 43 were categorized as *not likely to support* protected snakes, and 29 were categorized as *likely to support* protected snakes (Table 2). Access was denied to six sites. This categorization was based upon an approach developed by BHE and approved by MDC (Appendix A).

The eastern massasauga is a small rattlesnake averaging 17-24 inches in length. It ranges throughout the northeastern United States and parts of extreme southeastern Canada, extending south and west to Iowa and Missouri (Conant and Collins 1991). The species is rare throughout most of its range (Ernst and Barbour 1989); the United States Fish and Wildlife Service (USFWS) estimates the species has been extirpated from 40 percent of the 203 counties it historically occupied (Szymanski 1998). The eastern massasauga is classified as endangered or threatened by all but one of the states in which it occurs, and is currently a candidate for listing by the USFWS under the Endangered Species Act (Szymanski 1998). The primary cause of decline appears to be habitat loss and fragmentation due to human encroachment or vegetative succession (Johnson et al. 2000). Massasaugas are associated with wetlands and other moist, low-lying areas, and in winter, hibernate primarily in crayfish burrows which are used to access unfrozen, subsurface saturated soil (Johnson 1995; Kingsbury 1999).

The State of Missouri classifies the eastern massasauga as endangered. Eight counties currently support or have historically supported populations of eastern massasaugas (Szymanski 1998). USFWS records indicate that only Holt, Lynn, and Chariton counties have extant populations. The species is extirpated from four counties (Andrew, Platte, Jackson, and St. Charles) and is assumed to be extirpated from Livingston County (Szymanski 1998) (Figure 1).

and St. Charles) and is assumed to be extirpated from Livingston County (Szymanski 1998) (Figure 1).

The population of eastern massasaugas in Chariton County is located in the vicinity of the Swan Lake National Wildlife Refuge, near the town of Sumner in the northwestern corner of the county, approximately 5.5 miles north of the Keystone Mainline project area (Figure 1).

The western fox snake, named for a musky odor it produces when disturbed, is a medium-sized (35-54 inches in length) constricting snake of the genus *Elaphe*. The species' range includes the Upper Peninsula of Michigan, and extends south to northern Missouri, eastern Nebraska, and southeastern South Dakota (Conant and Collins 1998). The species shares many habitat requirements with the eastern massasauga, and is primarily found in wetlands and adjacent fields.

The State of Missouri classifies the western fox snake as an endangered species; populations in other states appear to be stable (Natureserve 2006). The species is not a candidate for listing, nor listed as threatened or endangered by the federal government. Historically, the western fox snake ranged throughout northern Missouri, but its numbers have declined due primarily to loss of habitat. Natureserve natural heritage database records (2006) indicate the western fox snake is known from eight Missouri counties: Andrew, Atchison, Clark, Gentry, Holt, Lewis, Lincoln, and St. Charles (Figure 2). In St. Charles County, the MDC reports a western fox snake population in Marais Temps Clair Conservation Area (Sexton 1993), approximately 0.3 mile north of the Keystone pipeline.

The massasauga and western fox snake are both associated with wetlands, and habitat requirements for the two species are very similar. An MDC-issued presence/absence survey protocol for the two species treats their habitat requirements as identical, an approach adopted herein. Both species are typically found in wet prairies, wet meadows, and open areas at the margins of wetlands. Presence and density of crayfish burrows, which are used as hibernacula, are important indicators of habitat suitability. Massasaugas do not appear to be evenly distributed across available wetland habitat during hibernation and spring emergence, suggesting that crayfish burrow density and distribution heavily influence massasauga occurrence. An empirical study of massasauga hibernation habitat at Squaw Creek National Wildlife Refuge in Holt County, Missouri, conducted by students at Missouri Western State University, found mean densities of 0.1 to 0.8 crayfish burrows per square meter (Carmack et al. 2004). Other recent research indicates that eastern massasaugas range widely during the warm season but tend to overwinter in relatively small areas (Harvey and Weatherhead 2006). These studies suggest suitable hibernacula for these snakes are scarce, and presence of appropriate hibernation sites may be a limiting factor in the snakes' distribution and occurrence. Both species have been found to avoid areas of inundated soil, and expanses of open water. Closed forests and dense woody vegetation are also typically avoided (Wright 1941, Weatherhead and Prior 1992).

The purpose of the investigation was to identify areas within the Keystone Mainline survey corridor that provide habitat suitable for these species during winter hibernation. Results of the survey will be used to focus future survey and/or monitoring efforts for the eastern massasauga and western fox snake during construction phases of the Keystone Mainline in Missouri.

2.0 METHODS

2.1 MAP REVIEW AND REMOTE HABITAT ASSESSMENT

USGS topographic maps, aerial photography, National Wetlands Inventory (NWI) maps, and maps of wetlands delineated by ENSR were used in autumn 2006 to identify regions of the Keystone pipeline corridor in Buchanan, Carroll, Chariton, and St. Charles counties, Missouri, where suitable habitat for the eastern massasauga and western fox snake may occur. For purposes of the remote habitat assessment, potential habitat was defined as any part of the construction corridor, a 200 foot wide survey corridor centered on the proposed centerline, in which a wetland is known to occur in association with an open area, e.g., a field next to a wetland. In areas where the Keystone Mainline parallels the REX-West pipeline right-of-way, the edge of the survey corridor is 65 feet on the side co-located with REX-West, and 100 feet on the greenfield side. In all other areas along the project route, the survey corridor is 200 feet centered on the proposed centerline (Figure 3). Wetlands that are completely forested were eliminated as potential habitat, as were areas of prolonged inundation or year-round open water.

Pipeline mileposts were used to delineate boundaries of potential habitat areas, each occurrence of potentially suitable habitat was assigned a unique alpha-numeric identifier (Table 1). Feature ID numbers adhered to one of two naming conventions.

Feature ID protocol for sites located on stand-alone Keystone survey corridor:

- FCCNNSCCCXXX
 - F = Feature Type ("NAT" for natural feature)
 - CC = Contractor Code
 - BHE (BH)
 - NN = Team Number
 - Team 1 - Becky Braeutigam and Drew Carson (BHE)
 - Team 2 - Chad Kinney (BHE) and Laura Vrabel (SCI)
 - Team 3 - Samantha Williams and Dave Norcross (BHE)
 - Team 4 - Lisa Winhold and John Alexander (BHE)
 - SC = State Code
 - Missouri (MO)
 - CC = County Code
 - Buchanan (BC)
 - Carroll (CR)
 - Chariton (CI)
 - St. Charles (SC)
 - XXX = Feature number (001-999)

Or

Feature ID protocol for Keystone sites co-located on shared survey corridor:

- FNNCCXXX
 - F = Feature Type ("NAT" for natural feature)
 - NN = Team Number

- Team 13 - Becky Braeutigam and John Alexander (BHE)
- Team 14 - Chad Kinney and Samantha Williams (BHE)
- CC = County Code
 - Buchanan (BC)
 - Carroll (CR)
 - Chariton (CI)
- XXX = Feature number (001-999)

2.2 ON-SITE HABITAT ASSESSMENT

Potential snake habitat identified during the remote habitat assessment was field-verified in November 2006. During the on-site assessment, each potential habitat feature was visited, evaluated, and categorized as either *likely to support* protected snake species (i.e., meets habitat requirements), or *not likely to support* protected snake species (does not meet habitat requirements).

Habitat categorization was primarily based upon these requirements:

- presence of seasonally or temporarily saturated soil
- presence of adjacent non-forested areas such as fields or meadows
- presence and density of potential hibernacula such as crayfish burrows.

As presence of suitable hibernacula appears to be the limiting factor to these snakes' occurrence, categorization of habitat *likely to support* was highly dependent upon presence of potential hibernacula such as crayfish or small mammal burrows, partially submerged root masses, or other means by which snakes can access subsurface saturated ground. If potential hibernacula were sparse (fewer than one per 10 square meters), or if surface soil was inundated, the area was categorized as *not likely to support* eastern massasaugas or western fox snakes.

Photographs and GPS points were taken at all sites visited during the field verification, including those categorized as not likely to support eastern massasaugas and western fox snakes (Appendix B). All areas were described on a Site Description Data Sheet (Appendix C). Information recorded on the Site Description Data Sheet included estimated tree canopy closure, density of crayfish burrows, site sketches, and general observations on the area's hydrology and vegetative cover.

3.0 RESULTS

3.1 MAP REVIEW AND REMOTE HABITAT ASSESSMENT

In October and November 2006, 78 areas of potential snake habitat were identified during the map review and remote habitat assessment (Table 1). These included floodplains, farm ponds, forested wetlands, wetlands in or adjacent to agricultural fields, and drainage ditches. A table listing the areas of potentially suitable habitat, identified using Keystone pipeline mileposts, was submitted to ENSR for review, and to coordinate access to private property on the pipeline corridor. Of the 78 sites identified, 13 sites (17%) were located in Buchanan

County, 15 sites (19%) in Carroll County, 25 sites (32%) in Chariton County, and 25 sites (32%) in St. Charles County.

3.2 ON-SITE HABITAT ASSESSMENT

Between November 6 and 15, 2006, BHE visited and evaluated the 78 sites identified during the remote habitat assessment. Of these sites, 43 (55%) were categorized as *not likely to support* protected snakes, and 29 (37%) were categorized as *likely to support* protected snakes (Table 2). Access was denied to six sites (8%).

Sites categorized as *not likely to support* eastern massasaugas and western fox snakes lacked suitable hibernacula, though some also had other disqualifying characteristics such as inundated surface soil or dense canopy cover. Sites categorized as not likely to support included two sites (NAT13BC001K and NAT13CI005) that were completely dry, seven sites (NAT13CI013, NATBH13MOSC011, NATBH13MOSC015 through 017, NATBH13MOSC023, and NATBH13MOSC024) that had been recently tilled, and three sites (NAT13CI009, NAT13CI010, and NATBH13MOSC006) that were heavily trampled and muddied by cattle.

Sites categorized as *likely to support* shared characteristics that make them appropriate for eastern massasaugas and western fox snakes: open tree canopy, sparse woody vegetation, presence of crayfish burrows or other suitable hibernacula, and presence of seasonally or temporarily saturated soil. Tree canopy closure at most of these sites was 50% or less, and all 29 sites contained crayfish burrows or other potential hibernacula. Of the 29 sites, most were located in or adjacent to agricultural fields. A brief description and photographs of each site categorized as *likely to support* follow below. A complete collection of site photographs may be found in Appendix B.

NAT13BC003

This site, located in Buchanan County, was surveyed on November 6th, 2006. The site is a wetland in an agricultural field with numerous crayfish burrows and emergent vegetation. Tree canopy closure over the wetland is approximately 2% and the dominant tree species is black willow (*Salix nigra*).



NAT13BC004

This site, located in Buchanan County, was surveyed on November 6th, 2006. The site is a wetland in a woodlot, surrounded by agricultural field, containing crayfish burrows and emergent vegetation. Tree canopy closure over the wetland is approximately 5% and the dominant tree species are black willow and eastern cottonwood (*Populus deltoides*).



NAT13BC005

This site, located in Buchanan County, was surveyed on November 7th, 2006. The site is a pond and associated wetland surrounded by pasture. The site contains crayfish burrows and root masses along the pond's banks. Tree canopy closure over the wetland is approximately 10% and the dominant tree species are white oak (*Quercus alba*), bur oak (*Q. macrocarpa*), and American elm (*Ulmus americana*).



NAT13BC006

This site, located in Buchanan County, was surveyed on November 7th, 2006. The site is a wooded ditch surrounded by agricultural field. The site contains crayfish burrows. Tree canopy closure over the ditch is approximately 60% and the dominant tree species are silver maple (*Acer saccharinum*) and sycamore (*Platanus occidentalis*).



NAT13BC007

This site, located in Buchanan County, was surveyed on November 7th, 2006. The site is a wetland surrounded by agricultural field that is adjacent to a levee. The site contains crayfish burrows and has no tree canopy cover.



NAT13BC008

This site, located in Buchanan County, was surveyed on November 7th, 2006. The site is an emergent/forested wetland surrounded by agricultural field. The site contains crayfish burrows. Tree canopy closure over the wetland is approximately 40% and the dominant tree species are silver maple and slippery elm (*Ulmus rubra*).



NAT13BC009

This site, located in Buchanan County, was surveyed on November 7th, 2006. The site is an emergent/forested wetland surrounded by agricultural field and pasture. The site contains crayfish burrows and root masses. Tree canopy closure over the wetland is approximately 20% and the dominant tree species are sycamore, American elm, and red oak (*Quercus rubra*).



NAT14BC010

This site, located in Buchanan County, was surveyed on November 7th, 2006. The site is a wooded wetland surrounded by agricultural field. The site contains crayfish burrows. Tree canopy closure over the wetland is approximately 50% and the dominant tree species is black willow.



NAT14BC011

This site, located in Buchanan County, was surveyed on November 7th, 2006. The site is a low grassy wetland adjacent to a pond and surrounded by agricultural field. The site contains crayfish burrows. Tree canopy closure over the wetland is approximately 5% and the dominant tree species is black willow.



NAT14BC013

This site, located in Buchanan County, was surveyed on November 7th, 2006. The site is a wetland adjacent to a pond and surrounded by agricultural field. The site contains crayfish burrows. Tree canopy closure over the wetland is approximately 15% and the dominant tree species is black willow.



NAT14CR004

This site, located in Carroll County, was surveyed on November 8th, 2006. The site is a wetland surrounded by agricultural field. The site contains crayfish burrows. Tree canopy closure over the wetland is approximately 4% and the dominant tree species is Osage orange (*Maclura pomifera*).



NAT14CR010

This site, located in Carroll County, was surveyed on November 8th, 2006. The site is a wooded wetland. Crayfish burrows located within the wetland are all found in the eastern end of the site. Tree canopy closure over the wetland is approximately 40% and the dominant tree species are hickory (*Carya cordiformis*), shagbark hickory (*C. ovata*), and boxelder (*Acer negundo*).



NAT14CR012

This site, located in Carroll County, was surveyed on November 9th, 2006. The site is a wetland in a field surrounded by occasional patches of trees. The site contains crayfish burrows. Tree canopy closure over the wetland is approximately 25% and the dominant tree species are eastern cottonwood and black willow.



NAT14CR015

This site, located in Carroll County, was surveyed on November 9th, 2006. The site is a wooded wetland crossed by two seasonal streams (dry at time of survey). The site contains crayfish burrows. Tree canopy closure over the wetland is approximately 50% and the dominant tree species is American elm.



NAT13CI001

This site, located in Chariton County, was surveyed on November 8th, 2006. The site is an emergent wetland adjacent to a tributary to the Grand River. The site contains crayfish burrows. Tree canopy closure over the wetland is approximately 30% and the dominant tree species are silver maple, sycamore, and oak (*Quercus* sp.).



NAT13CI002

This site, located in Chariton County, was surveyed on November 8th, 2006. The site is an emergent wetland adjacent to a tributary to the Grand River, abutting a levee. The site contains crayfish burrows, and there is no tree canopy closure over the wetland.



NAT13CI003

This site, located in Chariton County, was surveyed on November 8th, 2006. The site is a ditch running through an agricultural field. The site contains emergent vegetation, crayfish burrows, and there is no tree canopy closure over the wetland.



NAT13CI004

This site, located in Chariton County, was surveyed on November 8th, 2006. The site is a ditch running through an agricultural field. The site contains emergent vegetation, crayfish burrows, and there is no tree canopy closure over the wetland.



NAT13CI006

This site, located in Chariton County, was surveyed on November 8th, 2006. The site is a ditch running through an agricultural field. The site contains emergent vegetation, crayfish burrows, and there is no tree canopy closure over the wetland.



NAT13CI007

This site, located in Chariton County, was surveyed on November 8th, 2006. The site is an emergent wetland near a tributary to the Grand River, surrounded by woodlot. The site contains crayfish burrows, emergent vegetation, and patches of scrub/shrub. Tree canopy closure over the wetland is approximately 50%, and dominant tree canopy species are American elm, red oak, and slippery elm.



NAT13CI008

This site, located in Chariton County, was surveyed on November 9th, 2006. The site is a stream and associated wetland in a patchy woodlot, surrounded by pasture. The site contains crayfish burrows and emergent vegetation. Tree canopy closure over the wetland is approximately 30%, and dominant tree canopy species are American elm, red oak, and honey locust (*Gleditsia tricanthos*).



NAT13CI014

This site, located in Chariton County, was surveyed on November 9th, 2006. The site is a stream and associated forested wetland adjacent to a levee and agricultural field. The site contains crayfish burrows and emergent vegetation. Tree canopy closure over the wetland is approximately 40%, and dominant tree canopy species are American elm, red oak, and silver maple.



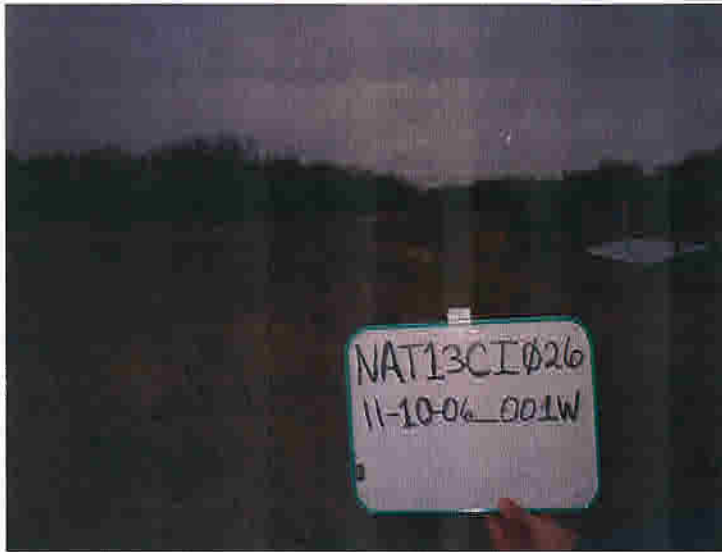
NAT13CI016

This site, located in Chariton County, was surveyed on November 9th, 2006. The site is a farm pond in a patchy woodlot, surrounded by pasture. The site contains crayfish burrows and emergent vegetation. Tree canopy closure over the wetland is approximately 20%, and dominant tree canopy species are honey locust, red oak, and eastern red cedar (*Juniperus virginiana*).



NAT13CI026

This site, located in Chariton County, was surveyed on November 10th, 2006. The site is a retention pond and associated wetland adjacent to a levee. The site contains abundant crayfish burrows and emergent vegetation. Tree canopy closure over the wetland is approximately 10%, and the dominant tree canopy species is red oak.



NATBH13MOSC001

This site, located in St. Charles County, was surveyed on November 13th, 2006. The site is a series of man-made ponds and associated forested wetlands. The site contains crayfish burrows and emergent vegetation. Tree canopy closure over the wetland is approximately 40%, and dominant tree canopy species are red oak, slippery elm, and silver maple.



NATBH13MOSC005

This site, located in St. Charles County, was surveyed on November 13th, 2006. The site is a man-made pond and associated emergent wetland, bordered by forest and agricultural field. The site contains crayfish burrows and emergent vegetation. Tree canopy closure over the wetland is approximately 40%, and dominant tree canopy species are bur oak, red oak, and silver maple.



NATBH13MOSC008

This site, located in St. Charles County, was surveyed on November 13th, 2006. The site is an emergent wetland surrounded by agricultural field. The site contains crayfish burrows and emergent vegetation. Tree canopy closure over the wetland is approximately 10%, and the dominant tree canopy species is honey locust.



NATBH13MOSC012

This site, located in St. Charles County, was surveyed on November 14th, 2006. The site is a ditch running through an agricultural field. The site contains crayfish burrows, and there is no tree canopy closure over the wetland.



NATRH13MOSC025

This site, located in St. Charles County, was surveyed on November 15th, 2006. The site is an emergent wetland near the confluence of the Mississippi and Missouri rivers, and adjacent to a levee. The site contains abundant crayfish burrows and emergent vegetation. There is no tree canopy closure over the wetland.



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TABLES

Table 1. Mileposts and ID numbers for sites on the Keystone pipeline in Missouri designated for on-site habitat evaluation.

County	West Milepost*	East Milepost*	Feature ID
Buchanan	748.50	748.70	NAT13BC001K
Buchanan	749.60	749.80	NAT13BC002K
Buchanan	752.20	752.50	NAT13BC003
Buchanan	752.50	752.70	NAT13BC004
Buchanan	756.70	756.80	NAT13BC005
Buchanan	761.30		NAT13BC006
Buchanan	762.90	763.00	NAT13BC007
Buchanan	763.00	763.10	NAT13BC008
Buchanan	763.40		NAT13BC009
Buchanan	764.90	765.00	NAT14BC010
Buchanan	765.40	765.50	NAT14BC011
Buchanan	765.80	765.90	NAT14BC012
Buchanan	766.30		NAT14BC013
Carroll	815.20	815.30	NAT14CR001
Carroll	815.60	815.70	NAT14CR002
Carroll	819.10	819.30	NAT14CR003
Carroll	819.40	819.50	NAT14CR004
Carroll	820.20		NAT14CR005
Carroll	820.40	820.50	NAT14CR006
Carroll	822.90	823.00	NAT14CR007
Carroll	823.10	823.20	NAT14CR008
Carroll	829.10	829.20	NAT14CR009
Carroll	829.80	830.00	NAT14CR010
Carroll	833.00	833.10	NAT14CR011
Carroll	834.30	834.40	NAT14CR012
Carroll	834.70	834.80	NAT14CR013
Carroll	837.50	837.60	NAT14CR014
Carroll	840.30	840.40	NAT14CR015
Chariton	841.00	841.10	NAT13CI001
Chariton	841.10	841.20	NAT13CI002
Chariton	841.50	841.60	NAT13CI003
Chariton	841.50	841.60	NAT13CI004
Chariton	841.70	842.40	NAT13CI005
Chariton	842.40	842.80	NAT13CI006
Chariton	842.90		NAT13CI007
Chariton	846.90	847.00	NAT13CI008
Chariton	849.40	849.50	NAT13CI009
Chariton	850.50	850.60	NAT13CI010
Chariton	853.30	853.40	NAT13CI011

CONFIDENTIAL

County	West Milepost*	East Milepost*	Feature ID
Chariton	854.20	854.30	NAT13CI012
Chariton	857.20	857.30	NAT13CI013
Chariton	857.50	857.60	NAT13CI014
Chariton	857.90		NAT13CI015
Chariton	858.40		NAT13CI016
Chariton	859.90	860.00	NAT13CI017
Chariton	860.80	861.00	NAT13CI018
Chariton	861.40		NAT13CI019
Chariton	861.70		NAT13CI020
Chariton	862.40	862.60	NAT13CI021
Chariton	862.70	862.90	NAT13CI022
Chariton	863.00	863.10	NAT13CI023
Chariton	871.10	871.20	NAT13CI025
Chariton	871.80	871.90	NAT13CI026
St. Charles	985.30	986.00	NATBH13MOSC001
St. Charles	986.90	987.40	NATBH13MOSC002
St. Charles	988.10	983.00	NATBH13MOSC003
St. Charles	988.30	988.70	NATBH13MOSC004
St. Charles	989.00	989.30	NATBH13MOSC005
St. Charles	989.40	989.50	NATBH13MOSC006
St. Charles	989.60		NATBH13MOSC007
St. Charles	989.70		NATBH13MOSC008
St. Charles	991.50	991.70	NATBH13MOSC009
St. Charles	995.70	995.80	NATBH13MOSC010
St. Charles	1002.30	1002.60	NATBH13MOSC011
St. Charles	1003.30	1003.40	NATBH13MOSC012
St. Charles	1003.90	1004.00	NATBH13MOSC013
St. Charles	1004.40	1004.50	NATBH13MOSC014
St. Charles	1006.40	1006.50	NATBH13MOSC015
St. Charles	1008.80		NATBH13MOSC016
St. Charles	1013.50	1013.70	NATBH13MOSC017
St. Charles	1015.00	1015.10	NATBH13MOSC018
St. Charles	1015.20		NATBH13MOSC019
St. Charles	1015.70	1015.80	NATBH13MOSC020
St. Charles	1016.00		NATBH13MOSC021
St. Charles	1016.70		NATBH13MOSC022
St. Charles	1018.00		NATBH13MOSC023
St. Charles	1018.30	1018.40	NATBH13MOSC024
St. Charles	1020.90	1021.10	NATBH13MOSC025

**Only a single milepost is provided for sites crossed by less than 100 meters of the pipeline corridor.*

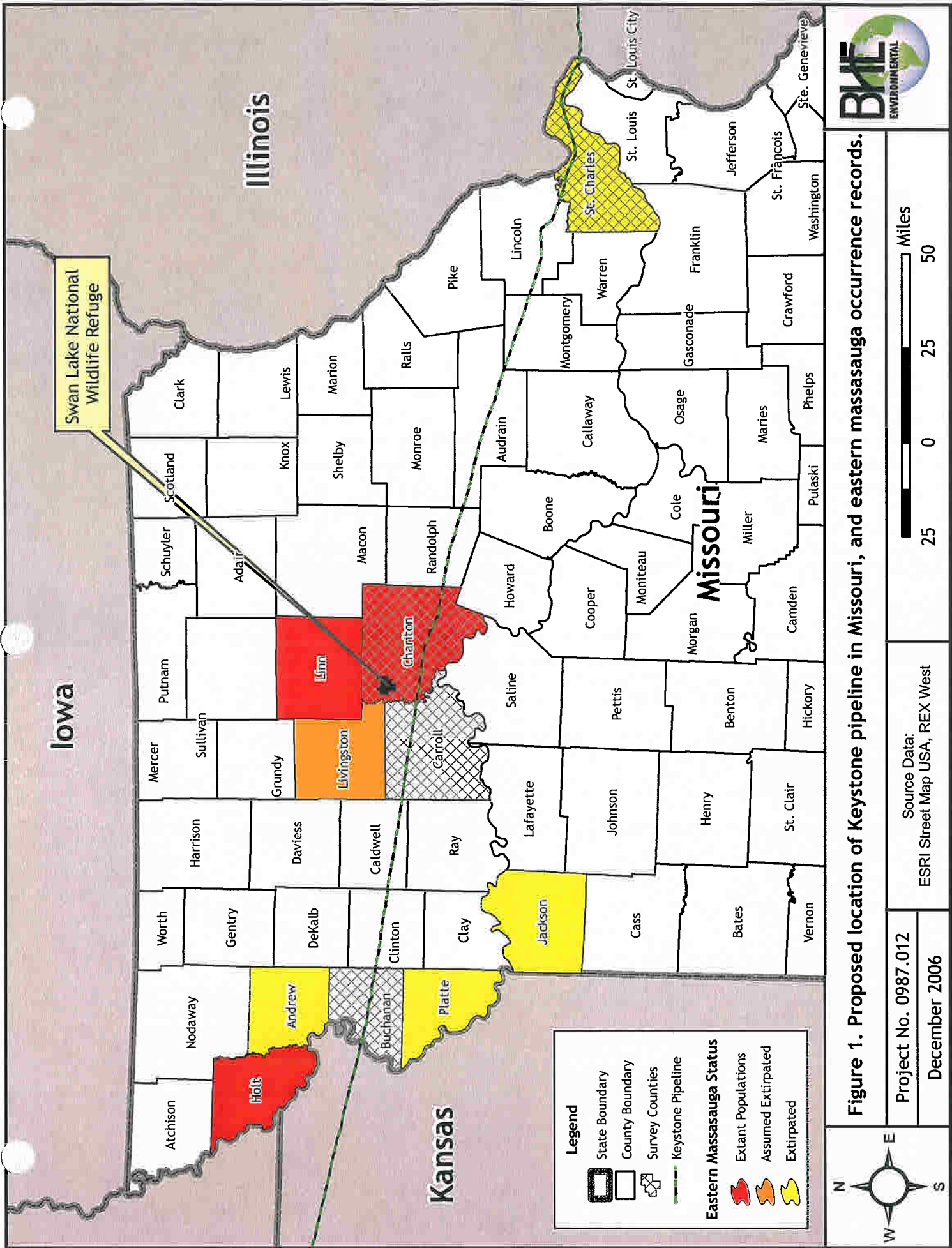
Table 2. Categorization and description of sites visited during on-site habitat evaluation within the construction corridor of the Keystone pipeline in Missouri.

County	Feature ID	Survey Date	Categorization	Description
Buchanan	NAT13BC001K	6 Nov 06	Not likely to support	Wooded area, no wetland present, no crayfish burrows
Buchanan	NAT13BC002K			Access denied
Buchanan	NAT13BC003	6 Nov 06	Likely to support	Wetland in agricultural field
Buchanan	NAT13BC004	6 Nov 06	Likely to support	Wetland in woodlot surrounded by agricultural field
Buchanan	NAT13BC005	7 Nov 06	Likely to support	Pond/wetland in wooded area surrounded by pasture
Buchanan	NAT13BC006	7 Nov 06	Likely to support	Wetland/ditch in agricultural field
Buchanan	NAT13BC007	7 Nov 06	Likely to support	Wetland in agricultural field
Buchanan	NAT13BC008	7 Nov 06	Likely to support	Emergent wetland
Buchanan	NAT13BC009	7 Nov 06	Likely to support	Emergent wetland
Buchanan	NAT14BC010	7 Nov 06	Likely to support	Wooded wetland in agricultural field
Buchanan	NAT14BC011	7 Nov 06	Likely to support	Low grassy area near pond
Buchanan	NAT14BC012	7 Nov 06	Not likely to support	Grassy retention area, no crayfish burrows
Buchanan	NAT14BC013	7 Nov 06	Likely to support	Wetland bordering pond surrounded by agricultural field
Carroll	NAT14CR001	8 Nov 06	Not likely to support	Wetland in pasture, no crayfish burrows
Carroll	NAT14CR002	8 Nov 06	Not likely to support	Wetland in agricultural field, no crayfish burrows
Carroll	NAT14CR003	8 Nov 06	Not likely to support	Wetland in agricultural field, no crayfish burrows
Carroll	NAT14CR004	8 Nov 06	Likely to support	Wetland in agricultural field
Carroll	NAT14CR005	8 Nov 06	Not likely to support	Wetland in agricultural field, only one crayfish burrow observed
Carroll	NAT14CR006	8 Nov 06	Not likely to support	Wetland in agricultural field, no crayfish burrows, inundated soil
Carroll	NAT14CR007	8 Nov 06	Not likely to support	Pond overflow ditch, no crayfish burrows
Carroll	NAT14CR008	8 Nov 06	Not likely to support	Pond overflow ditch, no crayfish burrows
Carroll	NAT14CR009	8 Nov 06	Not likely to support	Wooded edge of pond no crayfish burrows, dense canopy cover
Carroll	NAT14CR010	8 Nov 06	Likely to support	Patchy wooded wetland
Carroll	NAT14CR011	9 Nov 06	Not likely to support	Wetland in agricultural field next to road, no crayfish burrows
Carroll	NAT14CR012	9 Nov 06	Likely to support	Wetland in field surrounded by trees
Carroll	NAT14CR013	9 Nov 06	Not likely to support	Wetland in field, no crayfish burrows
Carroll	NAT14CR014	9 Nov 06	Not likely to support	Wetland in agricultural field adjacent to streambed, no crayfish burrows
Carroll	NAT14CR015	9 Nov 06	Likely to support	Patchy wooded wetland
Chariton	NAT13CI001	8 Nov 06	Likely to support	Emergent wetland adjacent to tributary to Grand River

County	Feature ID	Survey Date	Categorization	Description
Chariton	NAT13CI002	8 Nov 06	Likely to support	Emergent wetland adjacent to tributary to Grand River
Chariton	NAT13CI003	8 Nov 06	Likely to support	Wetland/ditch in agricultural field
Chariton	NAT13CI004	8 Nov 06	Likely to support	Wetland/ditch in agricultural field
Chariton	NAT13CI005	8 Nov 06	Not likely to support	Wooded area, no wetland, no crayfish burrows
Chariton	NAT13CI006	8 Nov 06	Likely to support	Wetland/ditch in agricultural field
Chariton	NAT13CI007	8 Nov 06	Likely to support	Emergent/scrub-shrub wetland
Chariton	NAT13CI008	9 Nov 06	Likely to support	Wetland in patchy woodland surrounded by pasture
Chariton	NAT13CI009	9 Nov 06	Not likely to support	Farm pond in pasture, no crayfish burrows, muddied by cattle
Chariton	NAT13CI010	9 Nov 06	Not likely to support	Farm pond in pasture, no crayfish burrows, muddied by cattle
Chariton	NAT13CI011	9 Nov 06	Not likely to support	Emergent wetland in agricultural field, no crayfish burrows
Chariton	NAT13CI012	9 Nov 06	Not likely to support	Emergent wetland/ditch in agricultural field, no crayfish burrows
Chariton	NAT13CI013	9 Nov 06	Not likely to support	Low area in agricultural field, no crayfish burrows, actively farmed
Chariton	NAT13CI014	9 Nov 06	Likely to support	Emergent wetland surrounding stream
Chariton	NAT13CI015	9 Nov 06	Not likely to support	Drainage ditch in agricultural field, no crayfish burrows
Chariton	NAT13CI016	9 Nov 06	Likely to support	Farm pond in woodland
Chariton	NAT13CI017	9 Nov 06	Not likely to support	Farm pond in pasture, no crayfish burrows
Chariton	NAT13CI018			Access denied
Chariton	NAT13CI019			Access denied
Chariton	NAT13CI020			Access denied
Chariton	NAT13CI021	10 Nov 06	Not likely to support	Wetland in woodland surrounded by agricultural field, no crayfish burrows
Chariton	NAT13CI022	10 Nov 06	Not likely to support	Woodlot in agricultural field, no crayfish burrows
Chariton	NAT13CI023	10 Nov 06	Not likely to support	Drainage ditch, no crayfish burrows
Chariton	NAT13CI025	10 Nov 06	Not likely to support	Wooded ditch, no crayfish burrows, dense canopy cover
Chariton	NAT13CI026	10 Nov 06	Likely to support	Emergent wetland at retention pond
St. Charles	NATBH13MOSC001	13 Nov 06	Likely to support	Man-made wetland in patchy forest
St. Charles	NATBH13MOSC002			Access denied
St. Charles	NATBH13MOSC003			Access denied
St. Charles	NATBH13MOSC004	13 Nov 06	Not likely to support	Man-made ponds in agricultural field, no crayfish burrows
St. Charles	NATBH13MOSC005	13 Nov 06	Likely to support	Emergent wetland near agricultural field
St. Charles	NATBH13MOSC006	13 Nov 06	Not likely to support	Ditch in agricultural field, no crayfish burrows, muddied by cattle
St. Charles	NATBH13MOSC007	13 Nov 06	Not likely to support	Emergent wetland in agricultural field, no crayfish burrows
St. Charles	NATBH13MOSC008	13 Nov 06	Likely to support	Wetland in agricultural field
St. Charles	NATBH13MOSC009	14 Nov 06	Not likely to support	Pond in agricultural field, no crayfish burrows

County	Feature ID	Survey Date	Categorization	Description
St. Charles	NATBH13MOSC010	14 Nov 06	Not likely to support	Emergent vegetation along creek, no crayfish burrows, polluted
St. Charles	NATBH13MOSC011	14 Nov 06	Not likely to support	Wetland in corn field, no crayfish burrows, actively farmed
St. Charles	NATBH13MOSC012	14 Nov 06	Likely to support	Wetland/ditch in agricultural field
St. Charles	NATBH13MOSC013	14 Nov 06	Not likely to support	Wetland in agricultural field, no crayfish burrows
St. Charles	NATBH13MOSC014	14 Nov 06	Not likely to support	Wetland surrounded by agricultural field, no crayfish burrows, dense canopy cover
St. Charles	NATBH13MOSC015	14 Nov 06	Not likely to support	Freshly tilled agricultural field, no crayfish burrows
St. Charles	NATBH13MOSC016	14 Nov 06	Not likely to support	Freshly tilled agricultural field, no crayfish burrows
St. Charles	NATBH13MOSC017	14 Nov 06	Not likely to support	Ditch through freshly tilled agricultural field, no crayfish burrows
St. Charles	NATBH13MOSC018	15 Nov 06	Not likely to support	Emergent scrub-shrub wetland, no crayfish burrows
St. Charles	NATBH13MOSC019	15 Nov 06	Not likely to support	Emergent scrub-shrub wetland, no crayfish burrows
St. Charles	NATBH13MOSC020	15 Nov 06	Not likely to support	Wetland surrounded by field, no crayfish burrows
St. Charles	NATBH13MOSC021	15 Nov 06	Not likely to support	Wetland surrounded by field, no crayfish burrows
St. Charles	NATBH13MOSC022	15 Nov 06	Not likely to support	Wetland in agricultural field, no crayfish burrows, inundated soil
St. Charles	NATBH13MOSC023	15 Nov 06	Not likely to support	Freshly tilled agricultural field, no crayfish burrows
St. Charles	NATBH13MOSC024	15 Nov 06	Not likely to support	Freshly tilled agricultural field, no crayfish burrows
St. Charles	NATBH13MOSC025	15 Nov 06	Likely to support	Wetland near confluence of Missouri and Mississippi rivers

FIGURES



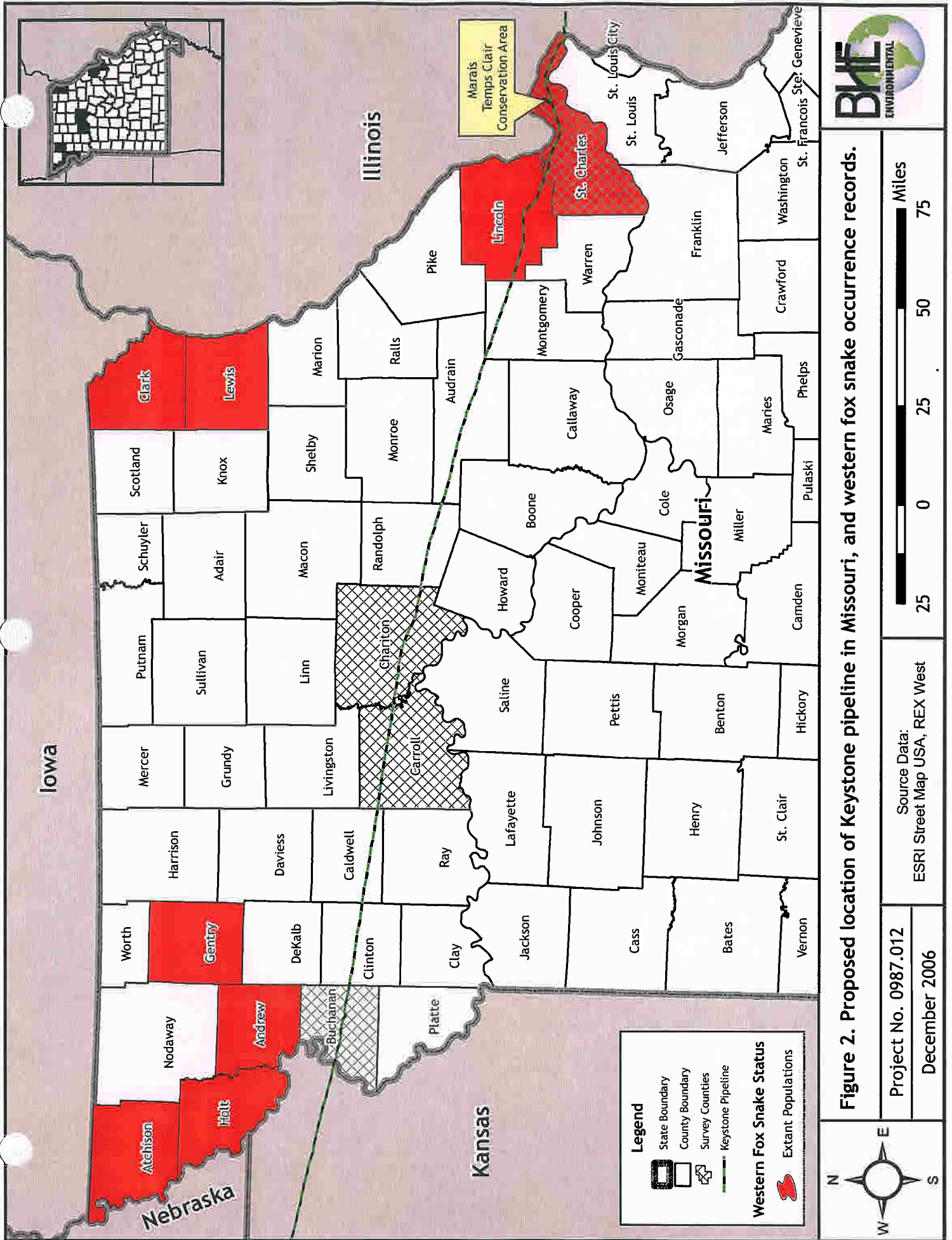


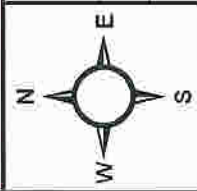
Figure 2. Proposed location of Keystone pipeline in Missouri, and western fox snake occurrence records.

Legend

- State Boundary
- County Boundary
- Survey Counties
- Keystone Pipeline

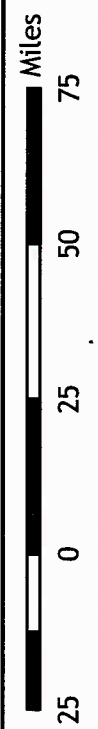
Western Fox Snake Status

- Extant Populations

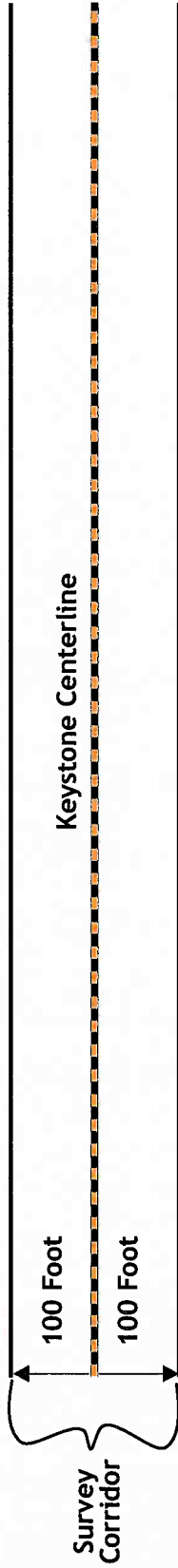


Source Data:
ESRI Street Map USA, REX West

Project No. 0987.012
December 2006



A



B



Figure 3. Diagrams of Keystone Mainline survey corridor where the pipeline is stand-alone (A) and where it is co-located with the REX-West pipeline right-of-way (B).

Project No. 0987.012	December 2006	100 0 100 200 Feet
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APPENDICES

Appendix A. MDC Concurrence with Study Plan

CONFIDENTIAL

Re BHE-ENSR snake study plan
From: Jeff Briggler [Jeff.Briggler@mdc.mo.gov]
Sent: Friday, October 20, 2006 5:56 PM
To: Melanie Gregory; Doyle Brown
Subject: Re: BHE-ENSR snake study plan

Melanie,

The plan looks good to me. This is definitely a great first step in determining what habitat actually occurs along the pipeline path. This assessment will be important in determine future monitoring efforts.

Sincerely,

Jeff Briggler
Herpetologist

The habitat assessment for determine potential monitoring efforts.

>>> Doyle Brown 10/18/06 4:32 PM >>>
Melanie,

We did receive the plans, I will let Jeff look them over and provide you with any comments.

Doyle

Doyle F. Brown
Policy Coordinator
Missouri Department of Conservation
P.O. Box 180
2901 West Truman Blvd.
Jefferson City, MO 65109
(573) 522-4115 Ext 3355
Doyle.brown@mdc.mo.gov

>>> "Melanie Gregory" <mgregory@bheenvironmental.com> 10/18/06 1:27 PM
>>>

Mr. Brown,
Just want to check in and make sure you received the study plans I sent via e-mail and fax on Monday.
ENSR hopes to initiate and complete the habitat assessment within the next few weeks, and we look forward to receiving your comments and/or concurrence as soon as possible.
Thanks very much for your assistance.

Sincerely,

BHE Environmental, Inc.
Melanie L. Gregory
Biologist
11733 Chesterdale Road
Cincinnati, OH 45246
Office: 513.326.1500
Direct: 513.326.1168
Mobile: 513.348.7833
Fax: 513.326.1178
mgregory@bheenvironmental.comwww.bheenvironmental.com

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Re BHE-ENSR snake study plan
not to be copied or forwarded to any unauthorized persons. If you have received this electronic mail transmission in error, please delete it from your system without copying or forwarding it, and notify the sender of the error by replying via email or by calling BHE Environmental, Inc. at 888.326.1500, so that our address record can be corrected.

Appendix B. Site Photographs and GPS Data

Photographs and GPS data are included in an attached CD-ROM



Appendix C. Field Data Sheets



Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NAT13BC001K MP: 748.5 - 748.7

Surveyor(s): Chad Kinney, Samantha Williams, Becky Braeutigam, John Alexander Date of Survey: 11-6-06

Location of Survey (Lat/Lon or UTM): N4401167.9^{59.393} BAB E 845805.750

State: Missouri or Illinois County: Buchanan

General description of site: wooded area, wetland no longer present Photo Number(s): 001N

Is standing water present? Y (N) Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? (Y) / N If yes, depth to saturated soil (cm): n/a not saturated at 12 in depth

Estimated distance to nearest permanent body of water (m): 20 Type of water body: lake/pond stream (river) Missouri River

Are crayfish burrows present? Y (N) If yes, estimated density (#/m²): n/a

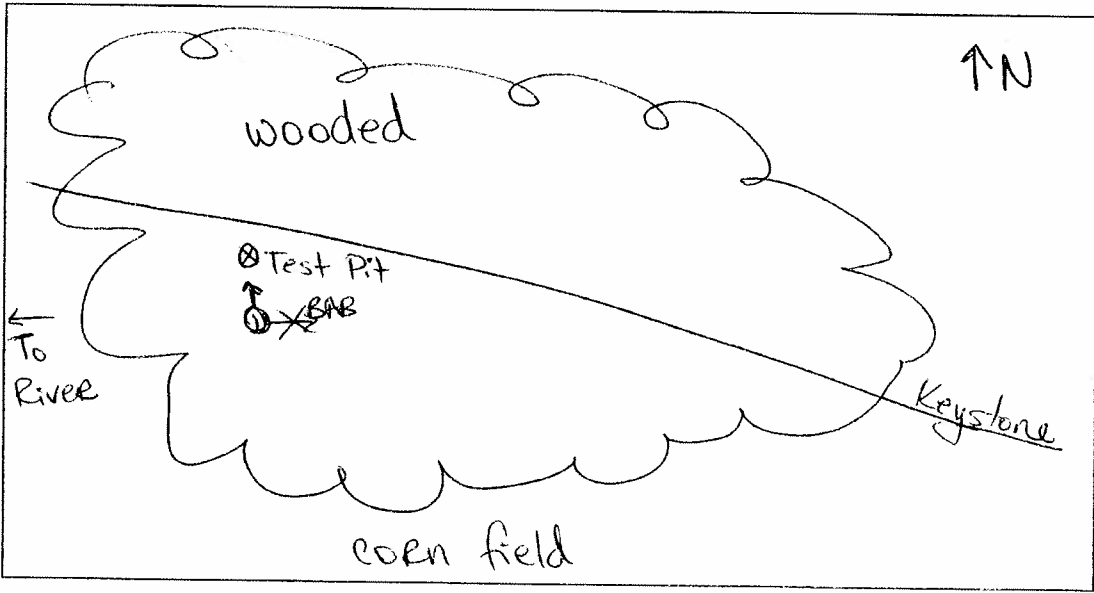
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) / N If yes, estimated percent canopy closure: 50 % Dominant species (3): Populus deltoides

Circle one: Area is likely to support or (not likely to support) protected snake species

Explain: no crayfish burrows, wetland no longer present

Sketch of Survey Area (indicate mileposts):



11733 Chesterdale R Cincinnati, Ohio 45246 513.326.1500 / Fax 513.326.1550

1733 Chesterdale Road Cincinnati, Ohio 45246 513.326.1500 / Fax 513.326.1550



Site Description Data Sheet

Feature/Wetland ID: NAT13BC003 MP: 540.77-540.97 (REX or KEY)
Surveyor(s): Chad Kinney, Samantha Williams, Becky Beaufort, John Alexander Date of Survey: 11-6-06

Location of Survey (Lat/Lon or UTM): N 4399984.047 E 851794.185

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in agricultural field Photo Number(s): 001E, 002 Test Pit, 003W

Is standing water present? Y/N Ground appears to be saturated: frequently temporarily/seasonally rarely not saturated

Was a test pit dug? Y/N If yes, depth to saturated soil (cm): n/a at 12 in depth

Estimated distance to nearest permanent body of water (m): n/a Type of water body: lake/pond stream river

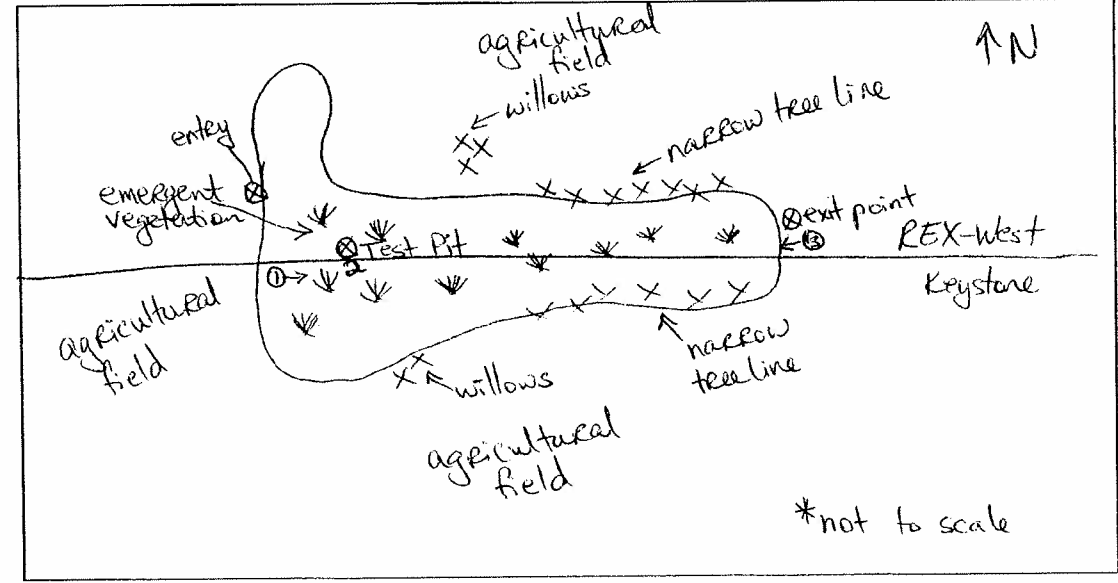
Are crayfish burrows present? Y/N If yes, estimated density (#/m^2): 0.7

Describe other potential hibernacula present: n/a

Are there trees in the area? Y/N If yes, estimated percent canopy closure: 2% Dominant species (3): Salix nigra

Circle one: Area is likely to support or not likely to support protected snake species Explain: crayfish burrows present, open canopy

Sketch of Survey Area (indicate mileposts):





Site Description Data Sheet

Feature/Wetland ID: NAT13BC004 MP: 540.97-541.07 (REX or KEY)

Surveyor(s): Becky Braefigam, John Alexander Date of Survey: 11-6-06

Location of Survey (Lat/Lon or UTM): N 4399985.226 E 852098.389

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in woodlot surrounded by agricultural fields Photo Number(s): 001E, 002 Test Pit, 003W

Is standing water present? Y (N)

Ground appears to be saturated: frequently temporarily/seasonally rarely not saturated at 12 in depth

Was a test pit dug? (Y) / N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): n/a
Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) / N If yes, estimated density (#/m²): 0.7

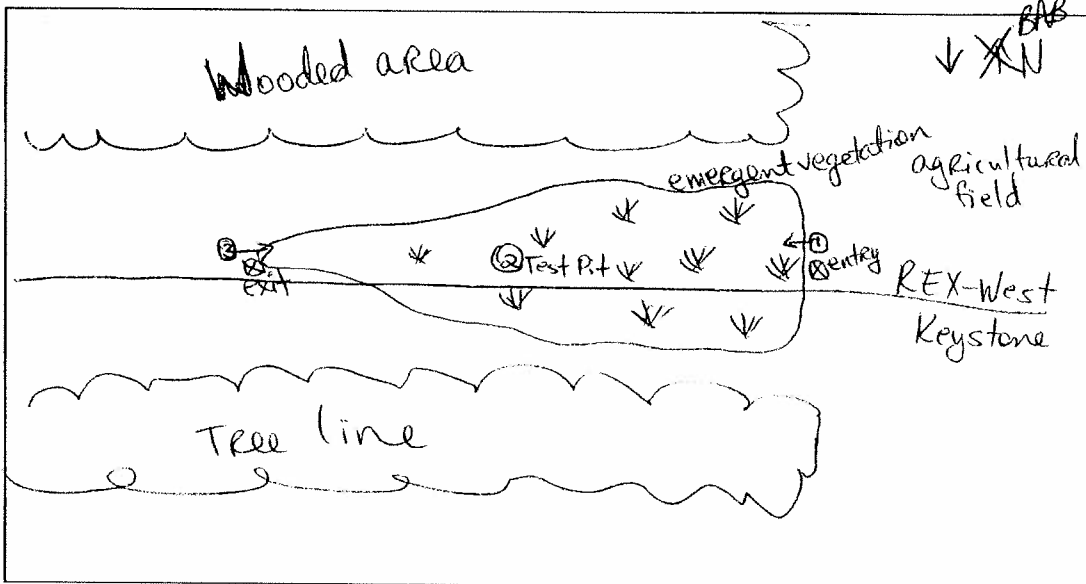
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) / N If yes, estimated percent canopy closure: 5 %
Dominant species (3): Salix nigra, Populus deltoides

Circle one: Area is likely to support or not likely to support protected snake species

Explain: crayfish burrows, open canopy

Sketch of Survey Area (indicate mileposts):



11733 Chesterdale Road Cincinnati, Ohio 45246 513.326.1500 / Fax 513.326.1550

11733 Chesterdale Ro. Cincinnati, Ohio 45246 513.326.1500 / Fax 513.326.1550



Site Description Data Sheet

Feature/Wetland ID: NAT13ABC005 MP: 545.17-545.27 (REX) or KEY)

Surveyor(s): Becky Beaufort, John Alexander Date of Survey: 11-7-06

Location of Survey (Lat/Lon or UTM): N 4399357.150 E 858700.505

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland/pond in wooded area surrounded by pasture Photo Number(s): 001W 002E

Is standing water present? (Y) / N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

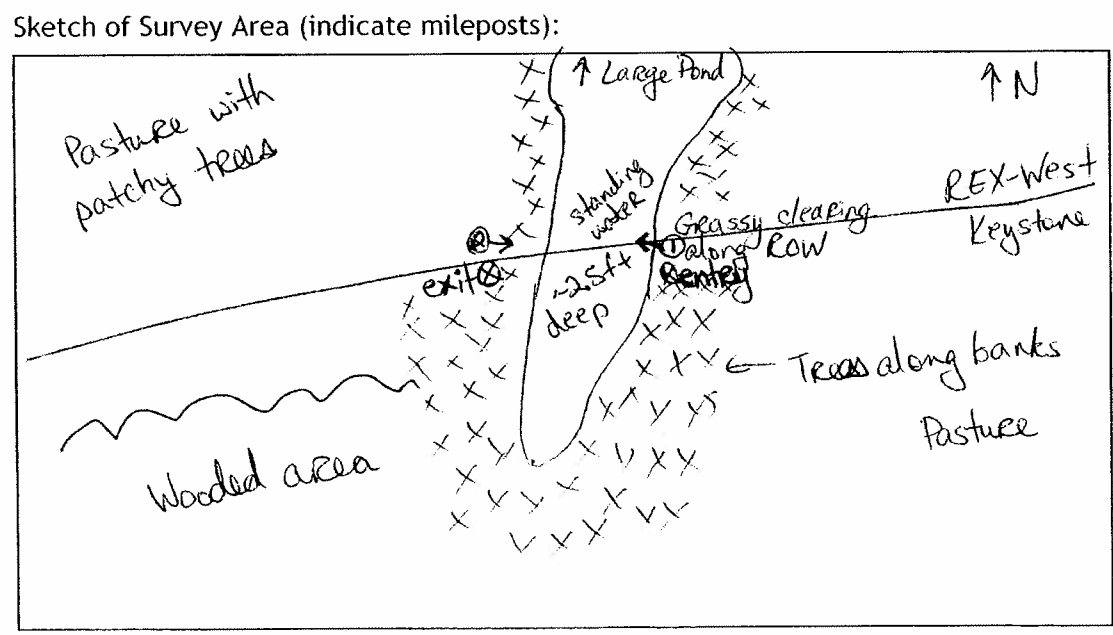
Estimated distance to nearest permanent body of water (m): 1 Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) / N If yes, estimated density (#/m^2): 0.6

Describe other potential hibernacula present: root mounds along bank

Are there trees in the area? Y / N If yes, estimated percent canopy closure: 10% Dominant species (3): Quercus alba, Quercus macrocarpa, Ulmus americana

Circle one: Area is likely to support or not likely to support protected snake species Explain: crayfish burrows, open canopy





Site Description Data Sheet

Feature/Wetland ID: NAT13BC006 MP: 549.77-549.87 (REX or KEY)

Surveyor(s): Becky Braeutigam, John Alexander Date of Survey: 11-7-06

Location of Survey (Lat/Lon or UTM): N4397929.166 E865555.573

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland/ditch in agricultural field Photo Number(s): 001W 002 Test Pit, 003E

Is standing water present? Y (N) Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? (Y) N If yes, depth to saturated soil (cm): 11

Estimated distance to nearest permanent body of water (m): 100 Type of water body: lake/pond stream river

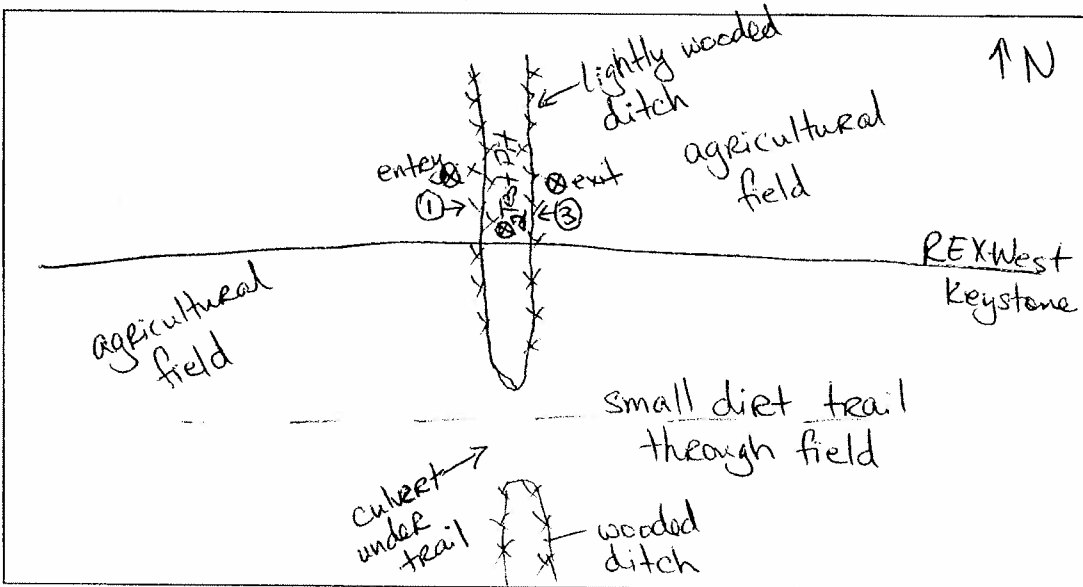
Are crayfish burrows present? (Y) N If yes, estimated density (#/m^2): 0.2

Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) N If yes, estimated percent canopy closure: 100 % Dominant species (3): Acer saccharinum, Platanus occidentalis

Circle one: Area is likely to support or not likely to support protected snake species Explain: crayfish burrows, moist soil

Sketch of Survey Area (indicate mileposts):



11733 Chesterdale Road Cincinnati, Ohio 45246 513.326.1500 / Fax 513.326.1550

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Site Description Data Sheet

Feature/Wetland ID: NAT13BC007 MP: SS1.47 (REX or KEY)

Surveyor(s): Becky Beentigam, John Alexander Date of Survey: 11-7-06

Location of Survey (Lat/Lon or UTM): N4398363.292 E 868073.415

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site:
wetland within agricultural field

Photo Number(s): 001E
002 crayfish burrow
003W

Is standing water present? Y (N)

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 50

Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) N If yes, estimated density (#/m²): 0.4

Describe other potential hibernacula present: n/a

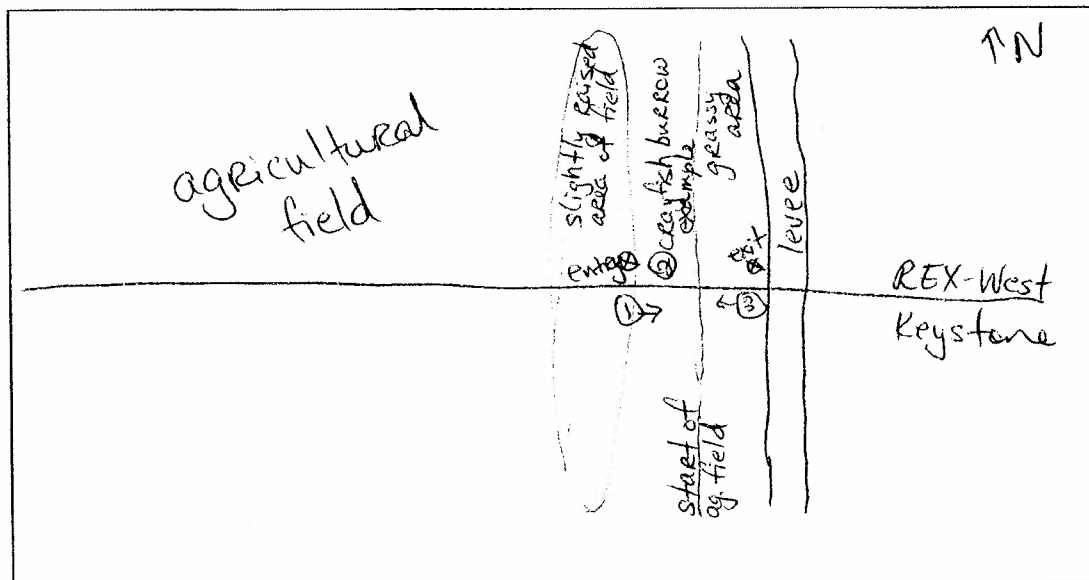
Are there trees in the area? Y (N) If yes, estimated percent canopy closure: n/a %

Dominant species (3): n/a

Circle one:
Area is likely to support or not likely to support protected snake species
Explain:

crayfish burrows, no canopy cover

Sketch of Survey Area (indicate mileposts):





Site Description Data Sheet

Feature/Wetland ID: NAT13BC008 MP: 541.47-541.57 (REX or KEY)

Surveyor(s): Becky Braeutigam, John Alexander Date of Survey: 11-7-06

Location of Survey (Lat/Lon or UTM): N4398322.093 E 868171.668

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: emergent/forested wetland with agricultural fields to east and west Photo Number(s): 001E, 002N, 003N, 004W

Is standing water present? (Y) / N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 20 Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) N If yes, estimated density (#/m^2): 0.5

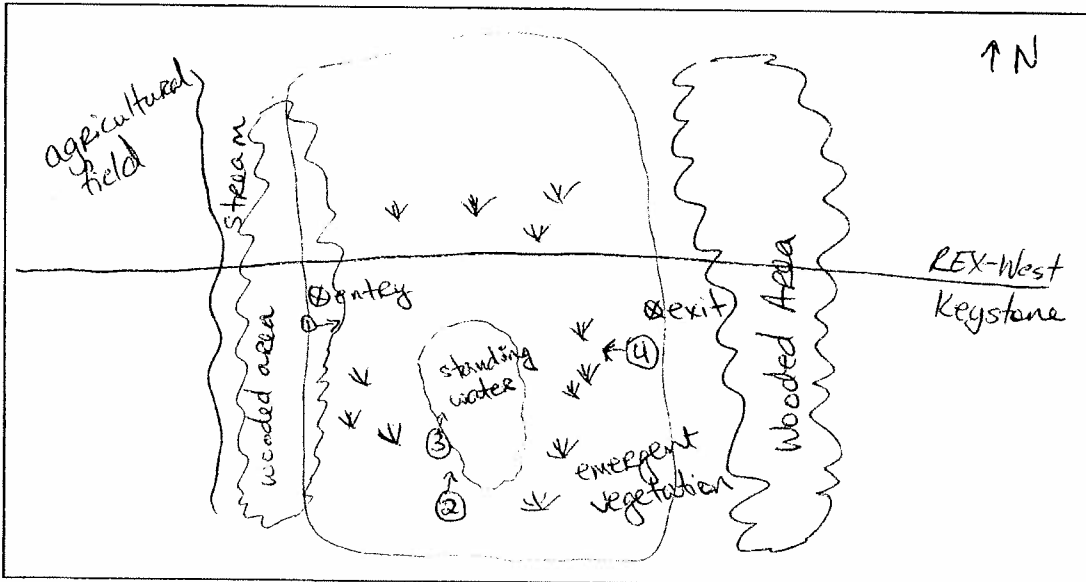
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) N If yes, estimated percent canopy closure: 40% Dominant species (3): Acer saccharinum, Ulmus rubra

Circle one: Area is likely to support or not likely to support protected snake species Explain:

crayfish burrows, moist soil

Sketch of Survey Area (indicate mileposts):



11733 Chesterdale R Cincinnati, Ohio 45246 513.326.1500 / Fax 513.326.1550

11733 Chesterdale Rd Cincinnati, Ohio 45246 513.326.1500 / Fax 513.326.1550



Site Description Data Sheet

Feature/Wetland ID: NAT13BC009 MP: 551.87-551.97 (REX or KEY)

Surveyor(s): Becky Beaufort, John Alexander Date of Survey: 11-7-06

Location of Survey (Lat/Lon or UTM): N 4398290.103 E 868803.470

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: emergent/forested wetland with agricultural fields surrounding. Photo Number(s): 001 W, 002 N, 003 E

Is standing water present? (Y) / N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 800 Type of water body: lake/pond stream river

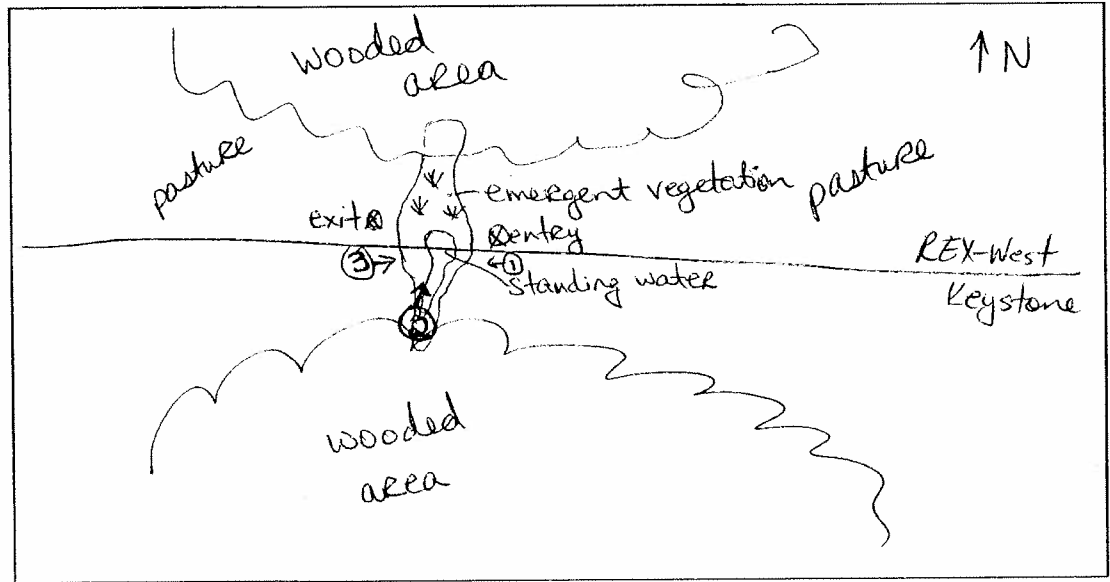
Are crayfish burrows present? (Y) / N If yes, estimated density (#/m^2): 0.3

Describe other potential hibernacula present: Some root masses

Are there trees in the area? (Y) / N If yes, estimated percent canopy closure: 20% Dominant species (3): Platanus occidentalis, Quercus rubra, Ulmus americana

Circle one: Area is likely to support or not likely to support protected snake species Explain: crayfish burrows, open canopy

Sketch of Survey Area (indicate mileposts):





Feature/Wetland ID: NAT148C010 Site Description Data Sheet MP: 353.47 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 7 November 2006

Location of Survey (Lat/Lon or UTM): 39° 39' 03.524 / 94° 40' 23.832

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wooded wetland in agriculture field Photo Number(s): 001W, 002 crayfish burrow, 003 test pit, 004 E

Is standing water present? Y/N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y/N If yes, depth to saturated soil (cm): 30 cm

Estimated distance to nearest permanent body of water (m): 400 Type of water body: lake/pond stream river

Are crayfish burrows present? Y/N If yes, estimated density (#/m^2): 4/m^2

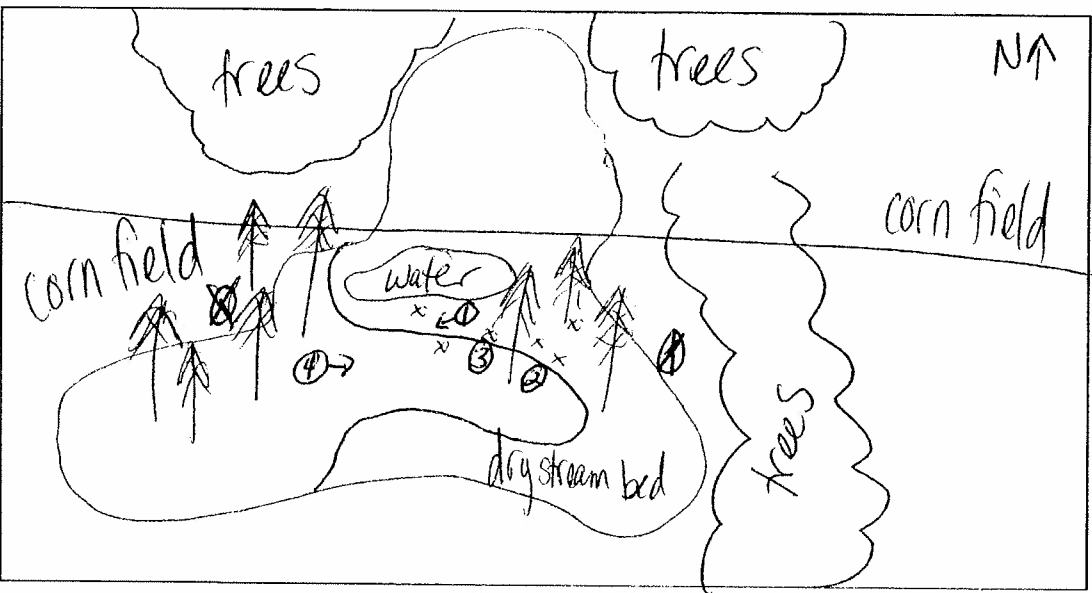
Describe other potential hibernacula present: n/a

Are there trees in the area? Y/N If yes, estimated percent canopy closure: 50% Dominant species (3): Salix nigra

Circle one: Area is likely to support or not likely to support protected snake species

Explain: crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT14BC011 MP: 553.87-553.97 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 7 November 2006

Location of Survey (Lat/Lon or UTM): 39° 38' 59.880" / 94° 39' 53.033"

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: lowland grass area surrounding pond Photo Number(s): 001S, 002E

Is standing water present? Y Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): n/a dug 12" no water present

Estimated distance to nearest permanent body of water (m): 50 Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): 5/m²

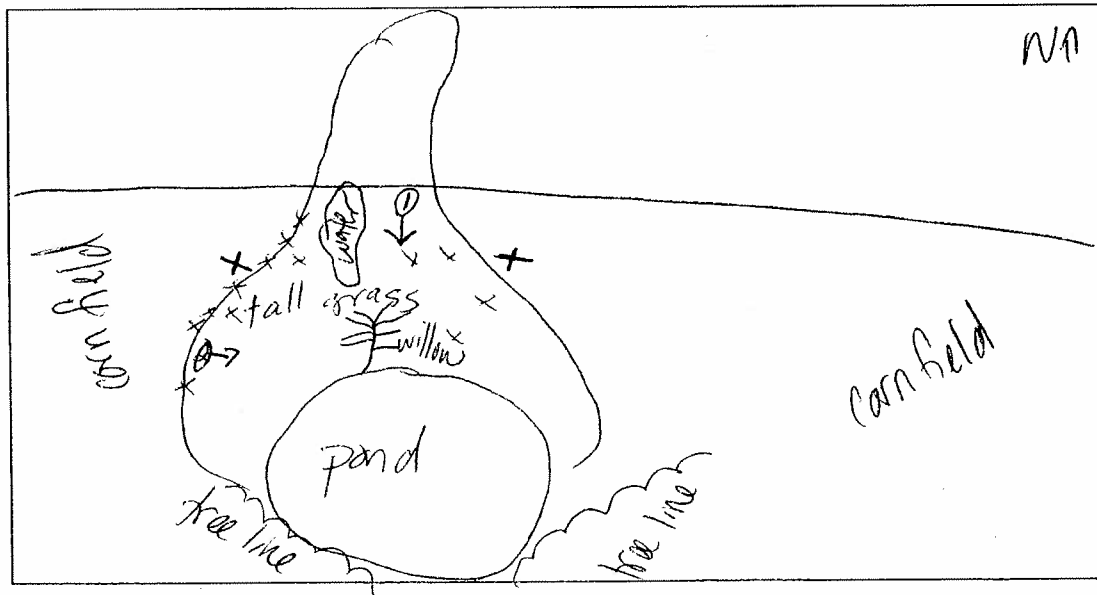
Describe other potential hibernacula present: small mammal burrows

Are there trees in the area? Y N If yes, estimated percent canopy closure: 5 % Dominant species (3): Salix nigra

Circle one: Area is likely to support or not likely to support protected snake species Explain:

crayfish burrows present
open canopy

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT/ABC 012 MP: 554.27-554.37 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 7 November 2006

Location of Survey (Lat/Lon or UTM): 39° 38' 55.125 / 94° 39' 26.008

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: retention area along grass waterway Photo Number(s): ~~001E-8W~~ 001S

Is standing water present? Y / N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 200 Type of water body: lake/pond stream river

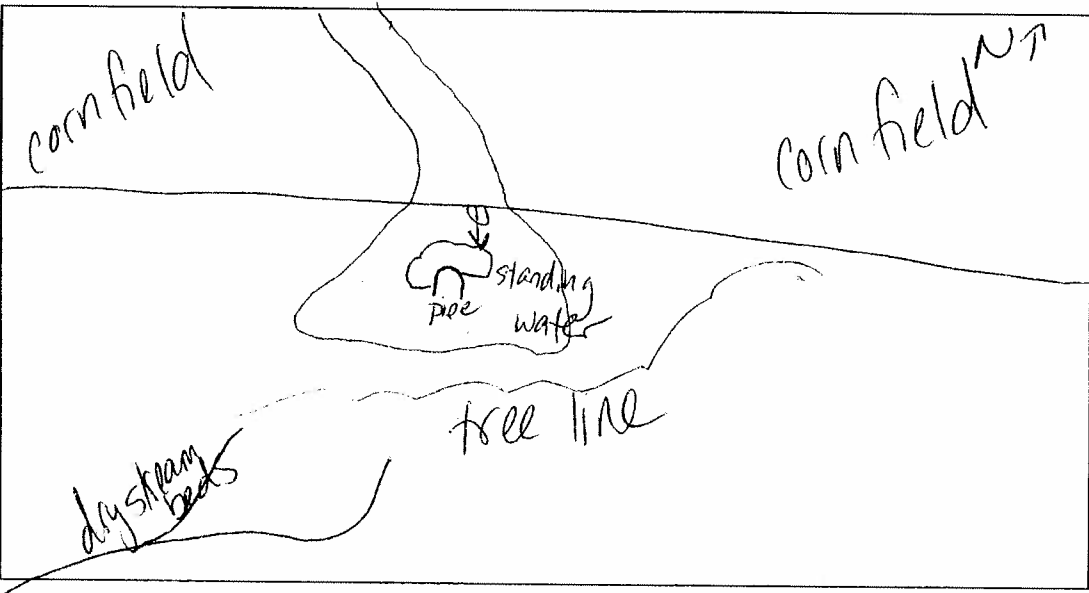
Are crayfish burrows present? Y / N If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: 0 % Dominant species (3): Celtis occidentalis

Circle one: Area is likely to support or not likely to support protected snake species Explain: no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT 14 BC 013 MP: 554.77 554.87 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 7 November 2006

Location of Survey (Lat/Lon or UTM): 39° 38' 50.753" N / 94° 38' 55.310" W

State: Missouri or Illinois County: Buchanan

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland bordering pond surrounded by agriculture field Photo Number(s): 001 W, 002 test pit, 003 N

Is standing water present? Y N Ground appears to be saturated: frequently temporarily/seasonally rarely n/a 1.2" pit dug, no

Was a test pit dug? Y N If yes, depth to saturated soil (cm): water present

Estimated distance to nearest permanent body of water (m): 50 Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): 7/m²

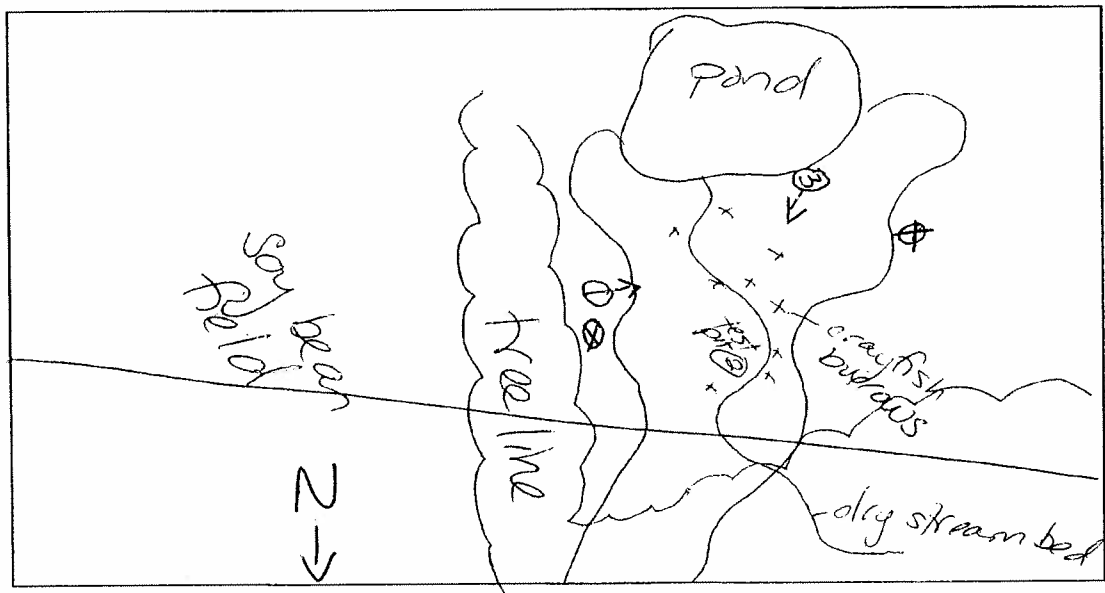
Describe other potential hibernacula present: n/a

Are there trees in the area? Y N If yes, estimated percent canopy closure: 15% Dominant species (3): Salix nigra

Circle one: Area is likely to support or not likely to support protected snake species

Explain: crayfish burrows present, no standing water open canopy

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT14CRO01 MP: 603.67-603.77 (REX) or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 8 November 2006

Location of Survey (Lat/Lon) or UTM: 39° 32' 41.421 / 93° 44' 42.345

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in pasture Photo Number(s): 0018

Is standing water present? Y/N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y/N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 40m Type of water body: lake/pond stream river

Are crayfish burrows present? Y/N If yes, estimated density (#/m²): n/a

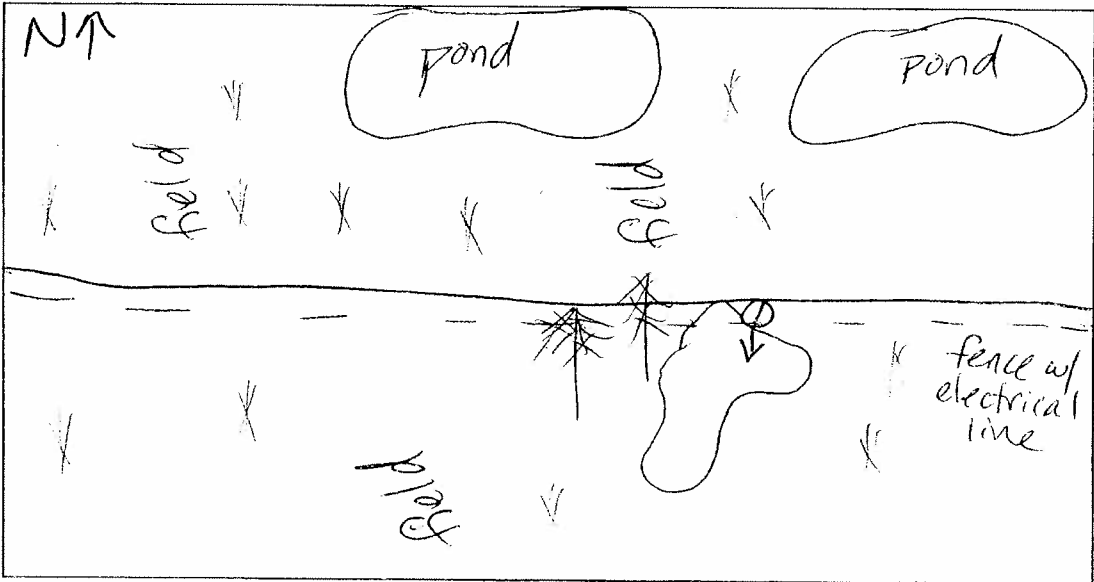
Describe other potential hibernacula present: n/a

Are there trees in the area? Y/N If yes, estimated percent canopy closure: 3% Dominant species (3): Gleditsia triacanthos

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows present in the wetland

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT 14 CR002 MP: 604.07-604.17 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 8 November 2000

Location of Survey (Lat/Lon or UTM): 39° 32' 36.028 / 93° 44' 16.014

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in agriculture field Photo Number(s): 001E *

Is standing water present? Y/N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y/N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 100 m Type of water body: lake/pond stream river

Are crayfish burrows present? Y/N If yes, estimated density (#/m²): n/a

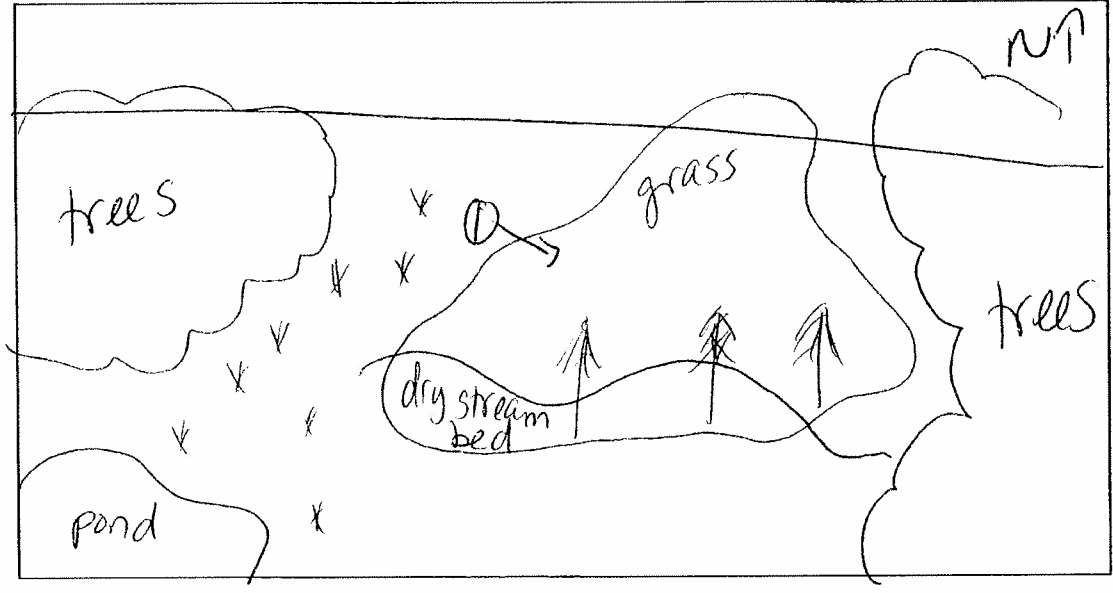
Describe other potential hibernacula present: n/a

Are there trees in the area? Y/N If yes, estimated percent canopy closure: 5% Dominant species (3): Glehnitzia triacanthos, Ulmus americana

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows present in wetland

Sketch of Survey Area (indicate mileposts):



* photo taken white board reads 11-08-06_001w picture taken facing E

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Site Description Data Sheet

Feature/Wetland ID: NAT14CR003 MP: 607.67-607.77 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 8 November 2000

Location of Survey (Lat/Lon or UTM): 39°32' 17.686 / 93°40' 15.211

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in ag. field Photo Number(s): 001E

Is standing water present? Y (N)
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 100 m
Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m²): n/a

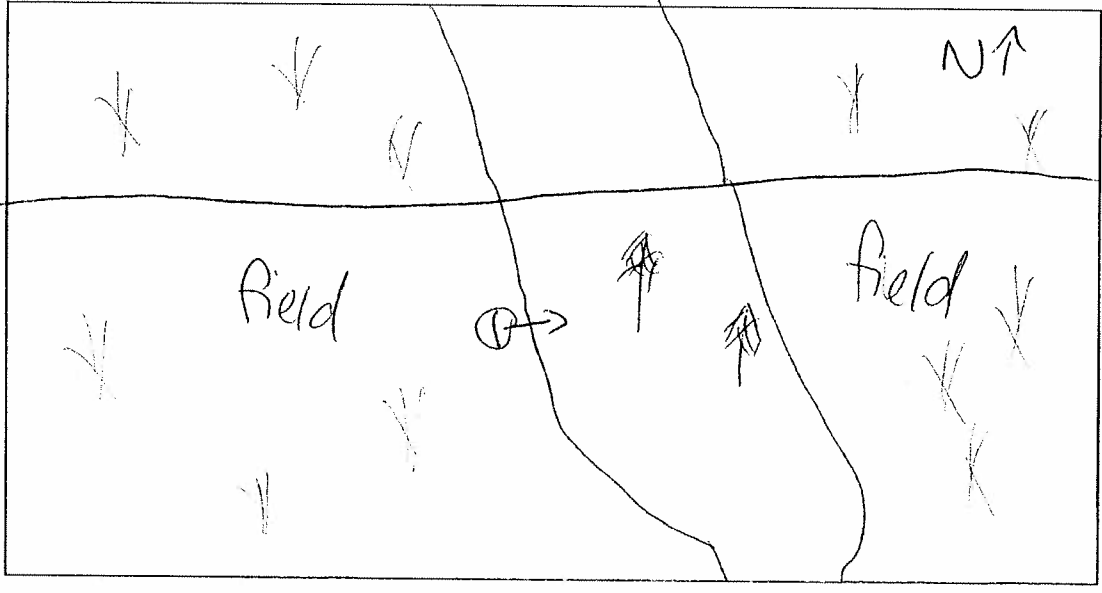
Describe other potential hibernacula present: n/a

Are there trees in the area? Y (N) If yes, estimated percent canopy closure: 3 %
Dominant species (3): Salix nigra

Circle one:
Area is likely to support or not likely to support protected snake species
Explain:

no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT14CR004 MP: 607.97 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 9 November 2000

Location of Survey (Lat/Lon or UTM): 39° 32' 16.672 / 93° 39' 58.650

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in ag. field Photo Number(s): 001 E
002 Test pit
003 W

Is standing water present? Y N
Ground appears to be saturated: frequently temporarily/seasonally rarely n/a dug 30 cm

Was a test pit dug? Y N If yes, depth to saturated soil (cm): no water

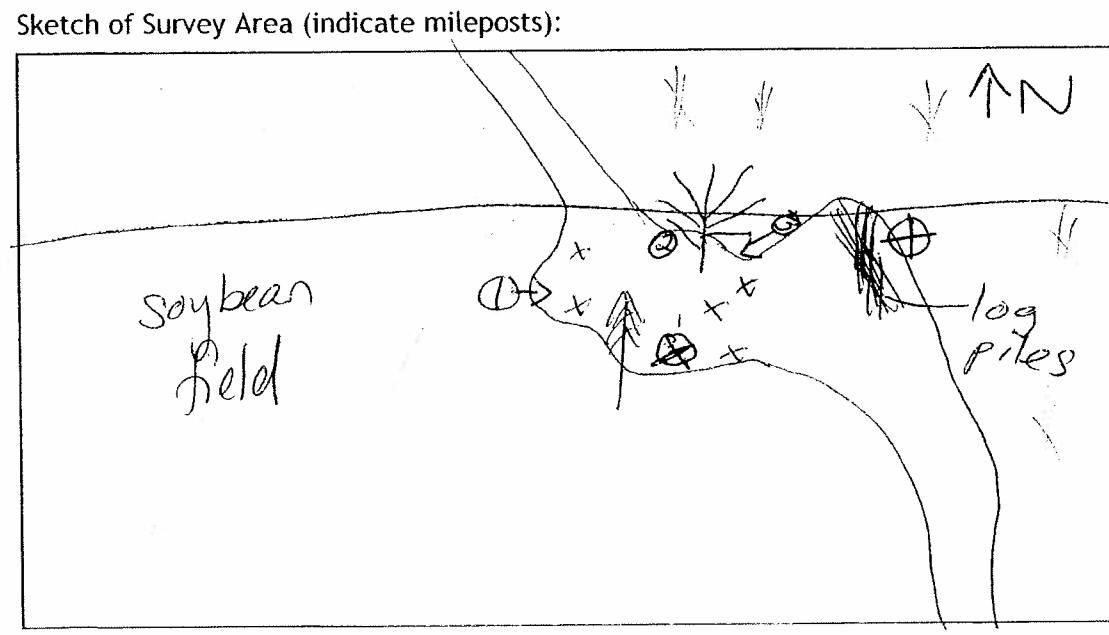
Estimated distance to nearest permanent body of water (m): 60 m
Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): .3/m²

Describe other potential hibernacula present: n/a

Are there trees in the area? Y N If yes, estimated percent canopy closure: 4 %
Dominant species (3): Maclura pomifera

Circle one: Area is likely to support or not likely to support protected snake species
Explain: crayfish burrows present in wetland



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Site Description Data Sheet

Feature/Wetland ID: NAT1402005 MP: 608.67-608.77 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 8 November 2006

Location of Survey (Lat/Lon) or UTM: 39° 32' 10.752 / 93° 33' 09.944

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in agriculture field Photo Number(s): 001 W

Is standing water present? Y N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): N/A

Estimated distance to nearest permanent body of water (m): 100 m
Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): 1/m²

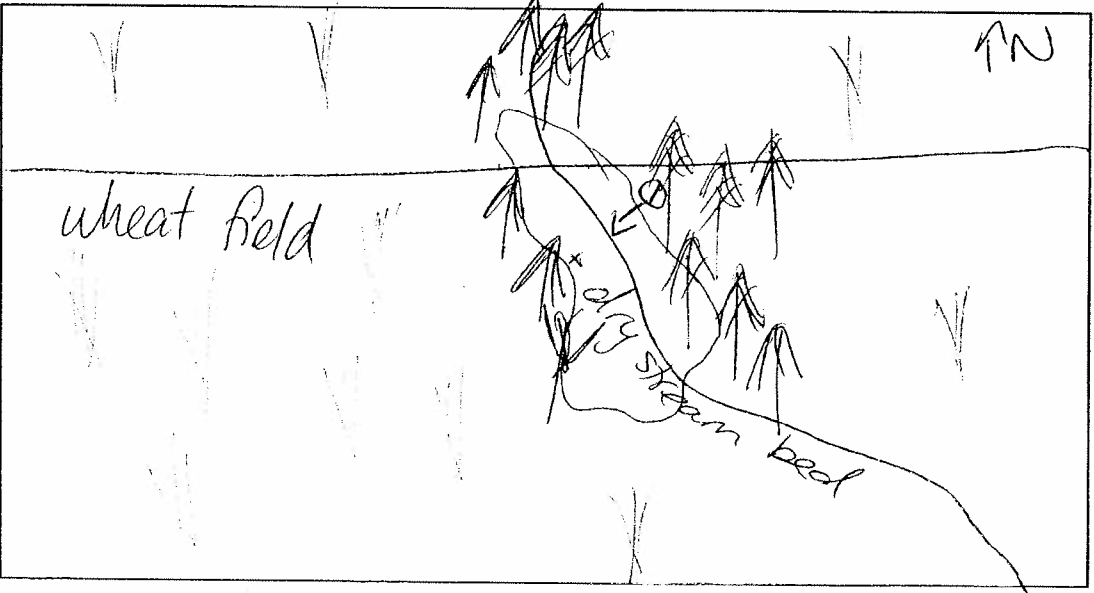
Describe other potential hibernacula present: N/A

Are there trees in the area? Y / N If yes, estimated percent canopy closure: 50 %
Dominant species (3): Maclura parifera, Quercus imbricaria

Circle one:
Area is likely to support or not likely to support protected snake species

Explain:
only one crayfish burrow, est. density < 1/m²

Sketch of Survey Area (indicate mileposts):



GRS*

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Site Description Data Sheet

Feature/Wetland ID: NATH CROCK MP: 608.87-608.97 (REX or KEY)

Surveyor(s): C. Kinney / S. Williams Date of Survey: 8 November 2006

Location of Survey (Lat/Lon or UTM): 35° 32' 08.516 / 93° 38' 56.807

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in forested ag. field Photo Number(s): 201E

Is standing water present? Y N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 150m
Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): n/a

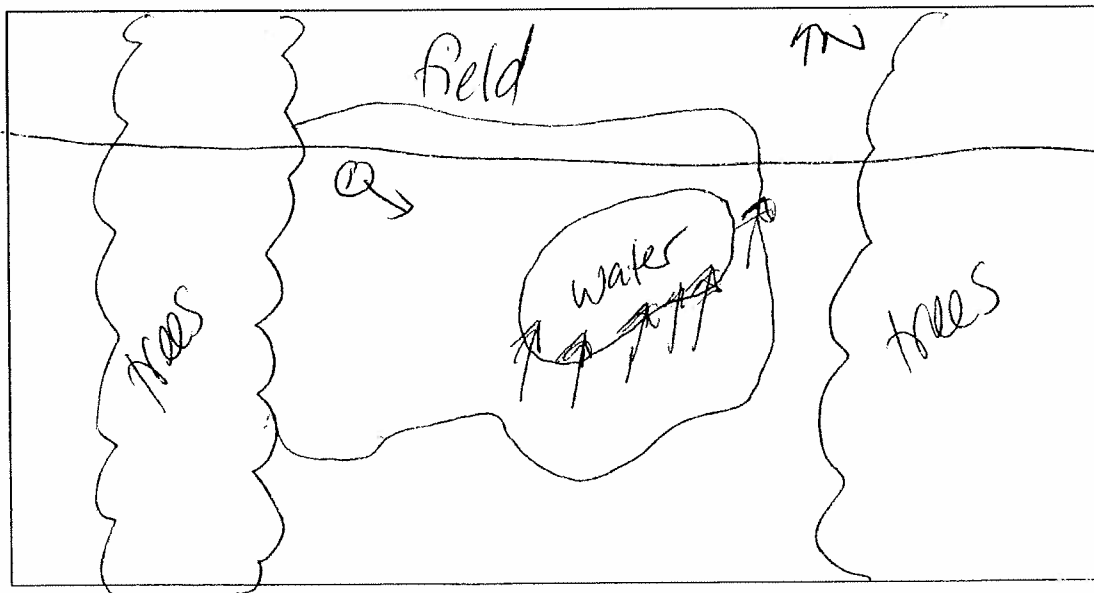
Describe other potential hibernacula present: n/a

Are there trees in the area? Y N If yes, estimated percent canopy closure: 5 %
Dominant species (3): Jatropha nigra

Circle one:
Area is likely to support or not likely to support protected snake species
Explain:

standing water, and no
crayfish burrows

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT14CR007 MP: 611.47 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 8 November 2006

Location of Survey (Lat/Lon or UTM): 39°31' 51.936 / 93°36' 08.823

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: Pond overflow along forest Photo Number(s): 0015

Is standing water present? Y N

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 20 m

Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

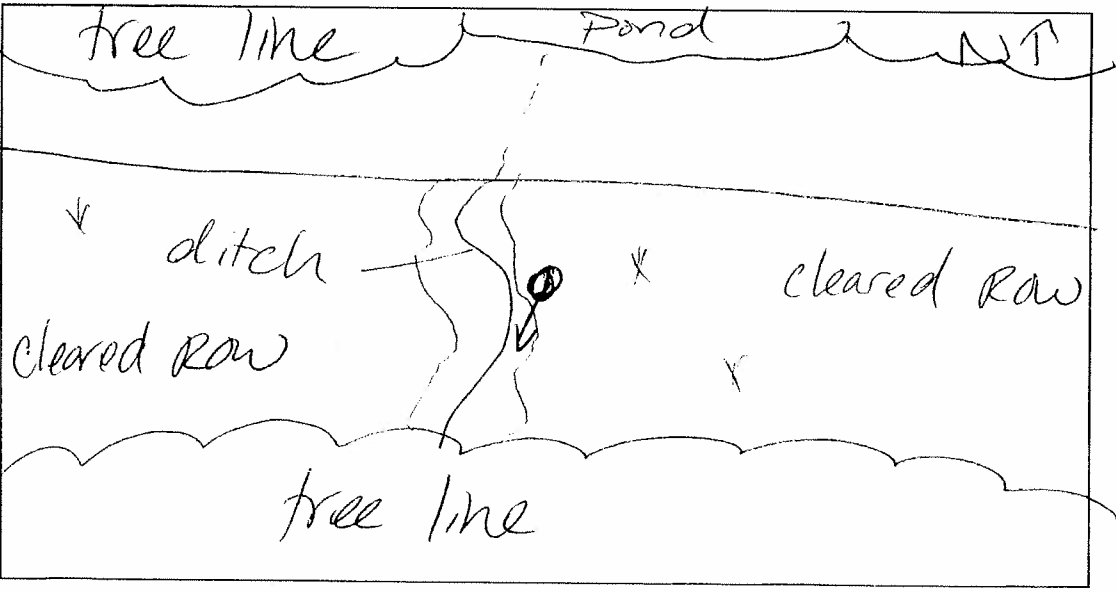
Are there trees in the area? Y N If yes, estimated percent canopy closure: n/a %

Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species

Explain: no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT14CR008 MP: 611.57-611.67 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 8 November 2010

Location of Survey (Lat/Lon or UTM): 39°31' 50.965 / 93°35' 54.796

State: Missouri or Illinois

County: Carroll

Circle one: Feature occurs on

REX-West

Keystone

Both (co-located)

General description of site:

pond overflow in ag. field

Photo Number(s): 2015

Is standing water present: Y / N

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N

If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 20m

Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: 0 %

Dominant species (3): n/a

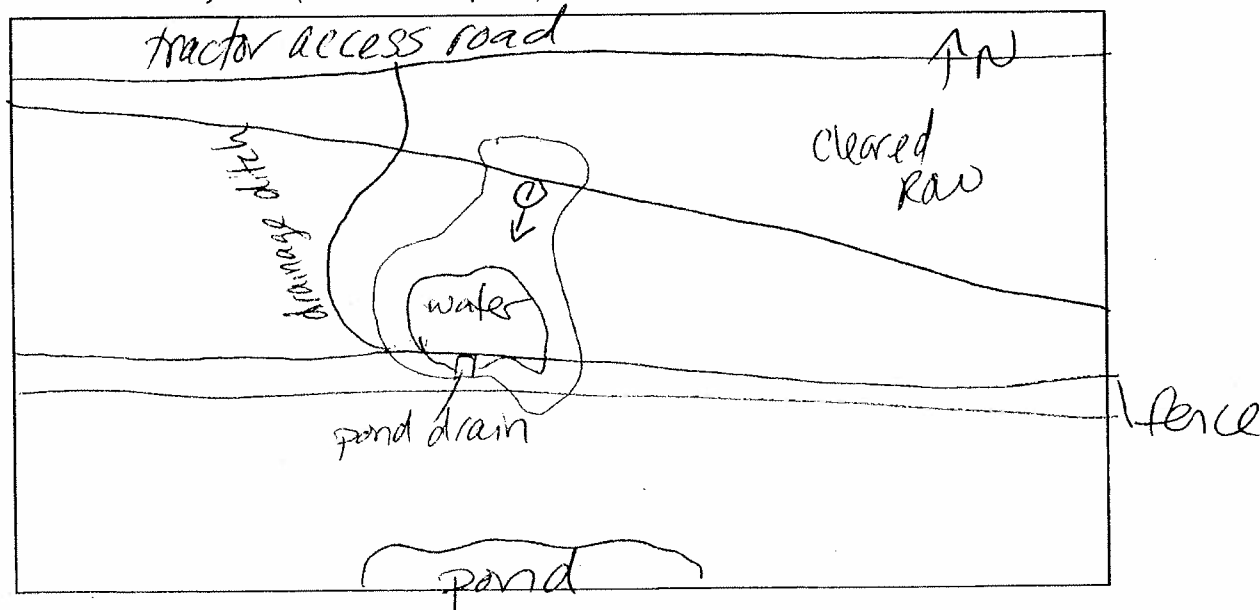
Circle one:

Area is likely to support or not likely to support protected snake species

Explain:

no crayfish burrows present

Sketch of Survey Area (indicate mileposts):





Site Description Data Sheet

Feature/Wetland ID: NAT14R009 MP: 617.57-617.67 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 8 November 2006

Location of Survey (Lat/Lon or UTM): 39° 31' 03.498 / 93° 23' 15.103

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wooded edge of pond Photo Number(s): 003

Is standing water present? Y N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 5m
Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): n/a

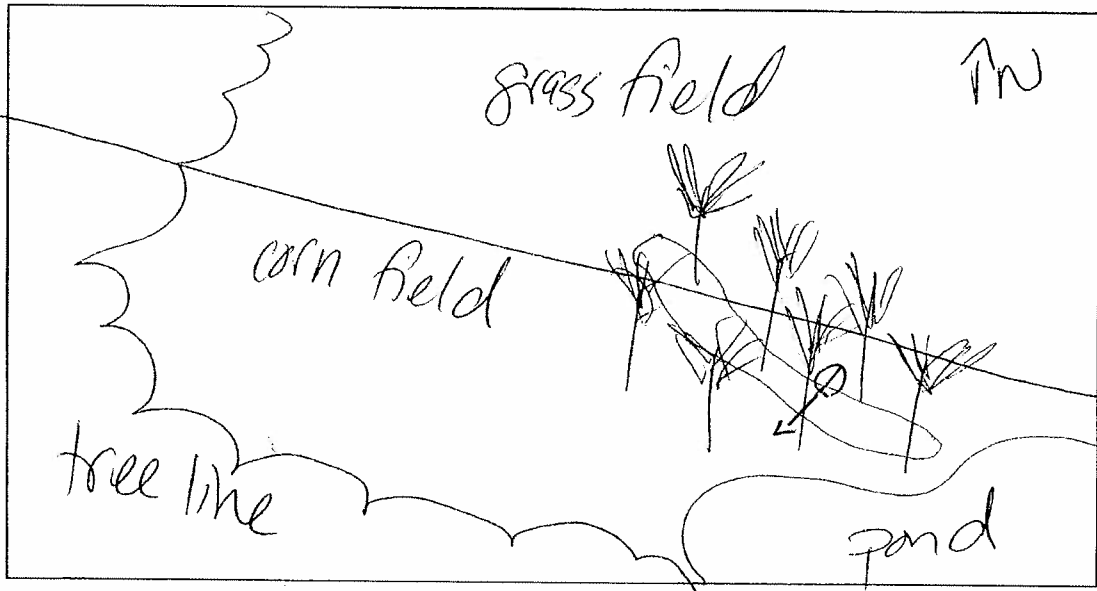
Describe other potential hibernacula present: n/a

Are there trees in the area? Y N If yes, estimated percent canopy closure: 60%
Dominant species (3): Alnus americana, Quercus imbricaria

Circle one:
Area is likely to support or not likely to support protected snake species

Explain:
no crayfish burrows present
heavy canopy cover

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT14CR010 MP: 618.27-618.47 (REX) or KEY

Surveyor(s): C. Kinney, S. Williams Date of Survey: 8 November 2006

Location of Survey (Lat/Lon or UTM): 89° 30 56.977 / 93° 28 24.885

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wooded wetland Photo Number(s): 001 W
002 test pit
003 E

Is standing water present? Y / N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N If yes, depth to saturated soil (cm): 30 cm

Estimated distance to nearest permanent body of water (m): 100 m
Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): 5/m²

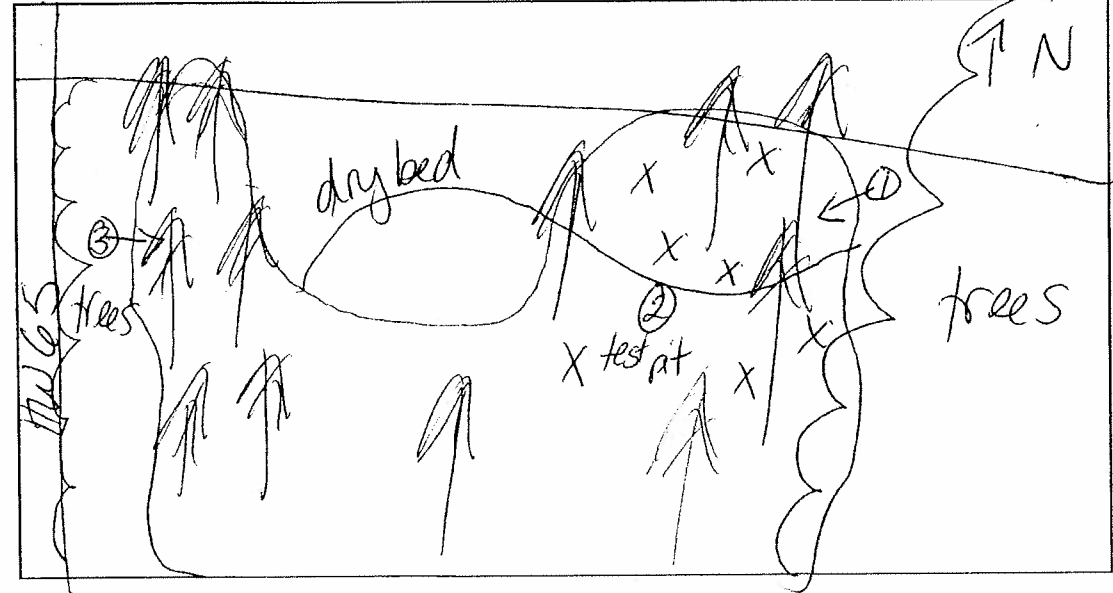
Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: 40 %
Dominant species (3): Larix laricina, Larix laricina, Acer negundo

Circle one: Area is likely to support or not likely to support protected snake species
Explain:

crayfish burrows present
all burrows were located on the eastern section of wetland

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT14CRO11 MP: 621.47-621.57 (REX or KEY)

Surveyor(s): C. Kinney, J. Williams Date of Survey: 9 November 2006

Location of Survey (Lat/Lon or UTM): 39° 30' 29.599 / 98° 24' 57.228

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in ag. field along road Photo Number(s): 001E

Is standing water present? Y N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 100 m
Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): n/a

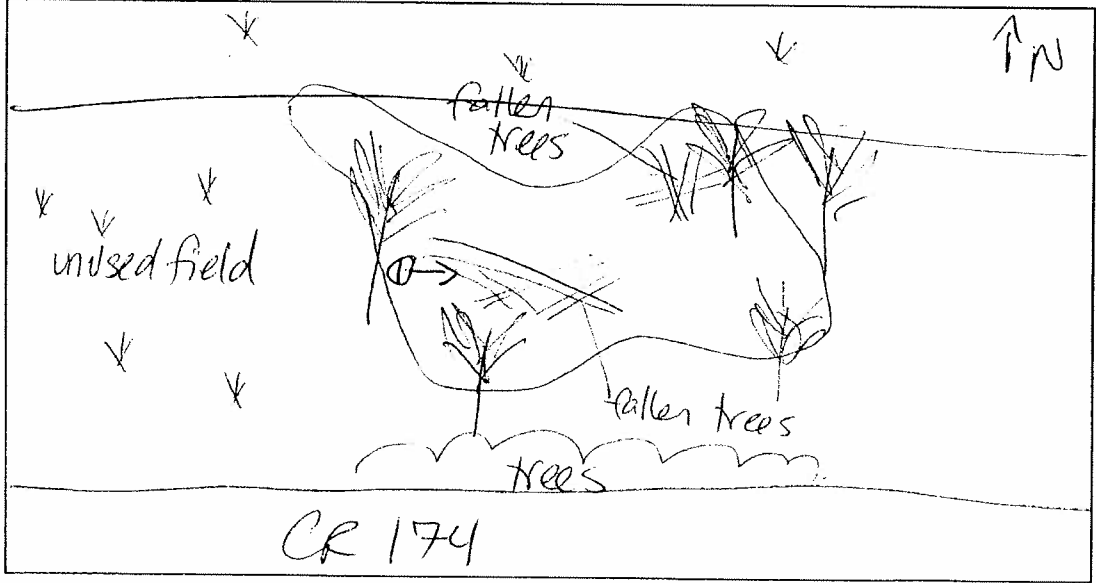
Describe other potential hibernacula present: n/a

Are there trees in the area? Y N If yes, estimated percent canopy closure: 10 %
Dominant species (3): Ulmus americana

Circle one:
Area is likely to support or not likely to support protected snake species
Explain:

no crayfish burrows present in wetland

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT14CR 012 MP: 622.77-622.87 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 9 November 2006

Location of Survey (Lat/Lon or UTM): 39°30' 20.896 / 93°23' 31.233

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in field surrounded by trees

Photo Number(s): 001E
002 test pit
003W

Is standing water present? Y N

Ground appears to be saturated: frequently temporarily/seasonally rarely n/a dug 30 cm ground very dry

Was a test pit dug? Y N If yes, depth to saturated soil (cm): ground very dry

Estimated distance to nearest permanent body of water (m): 80m
Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): 5/m²

Describe other potential hibernacula present: n/a

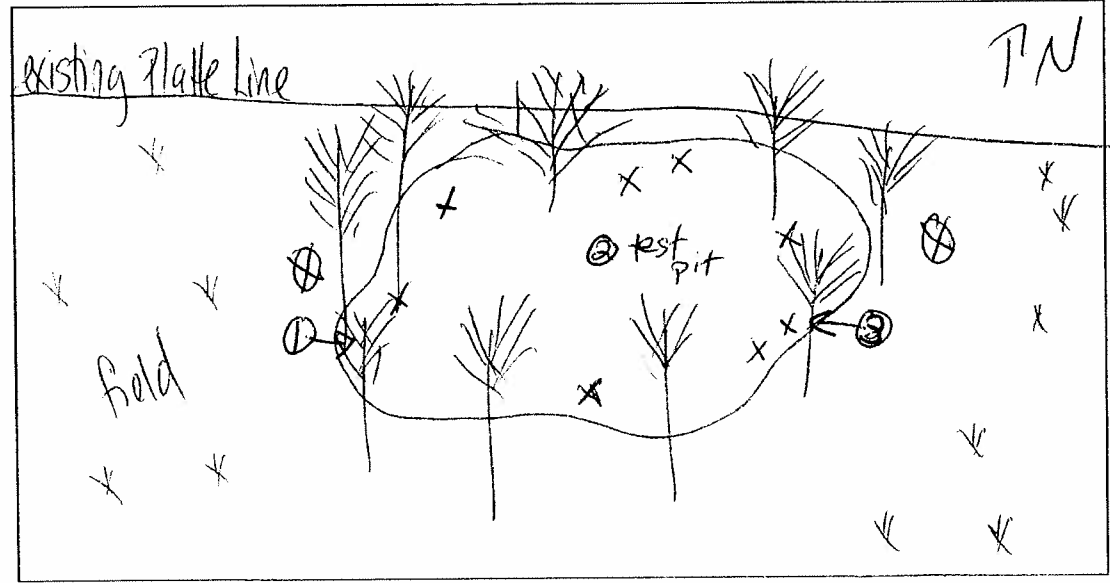
Are there trees in the area? Y N If yes, estimated percent canopy closure: 25 %

Dominant species (3): Fragulus deltoides, Salix nigra

Circle one: Area is likely to support or not likely to support protected snake species

Explain: crayfish burrows present
no standing water

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT14CR013 MP: 623.27-623.37 (REX or KEY)

Surveyor(s): C. Konecny, S. Williams Date of Survey: 9 November 2006

Location of Survey (Lat/Lon or UTM): 39° 30' 10.938 / 93° 23' 14.806

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in field Photo Number(s): 001W

Is standing water present? Y N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 5 Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): n/a

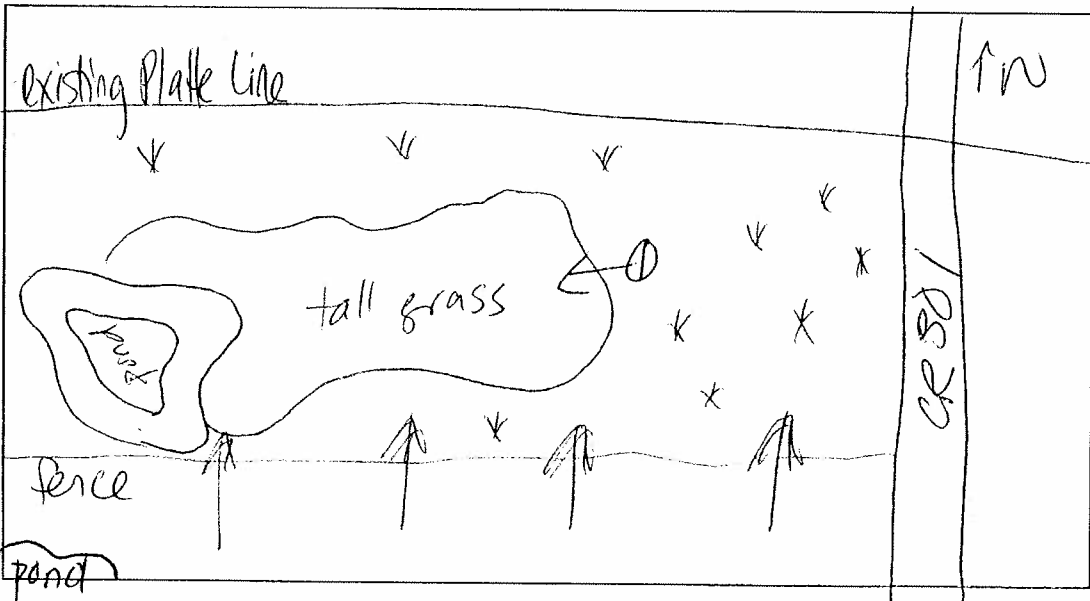
Describe other potential hibernacula present: n/a

Are there trees in the area? Y N If yes, estimated percent canopy closure: 0% Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows

Sketch of Survey Area (indicate mileposts):



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Vertical line of plus signs



Site Description Data Sheet

Feature/Wetland ID: NAT14CRO14 MP: 625.87-625.97 (REX) or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 9 November 2006

Location of Survey (Lat/Lon or UTM): 39°29'52.306 / 93°20'03.758

State: Missouri or Illinois County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland in ag. field along stream bed Photo Number(s): 0015

Is standing water present? Y (N) Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 5 Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m²): n/a

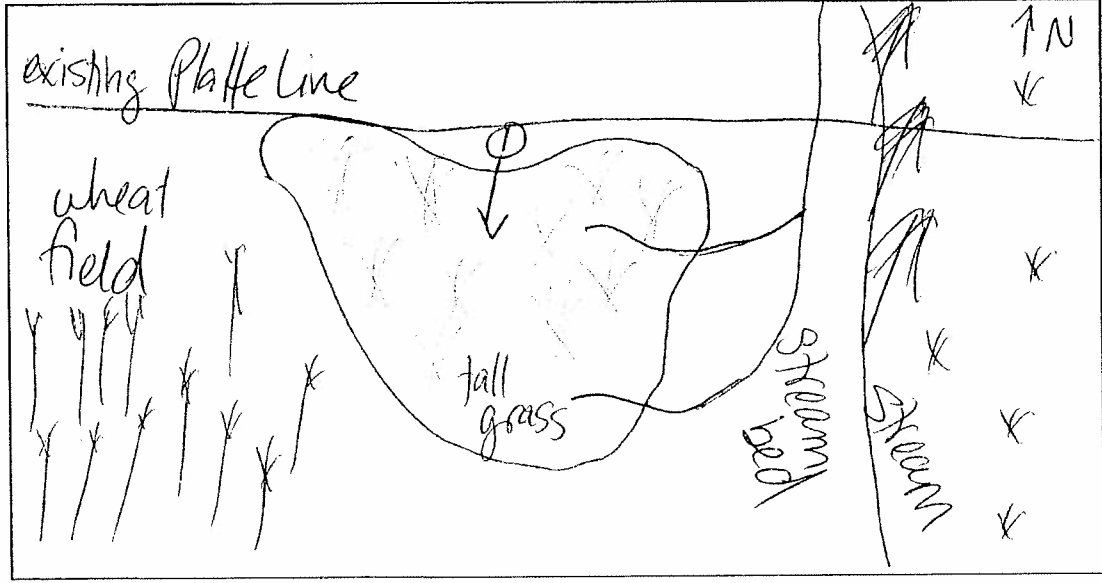
Describe other potential hibernacula present: n/a

Are there trees in the area? Y (N) If yes, estimated percent canopy closure: 0% Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species

Explain: no crayfish burrows present in wetland

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT14CRO15 MP: 028.87 (REX or KEY)

Surveyor(s): C. Kinney, S. Williams Date of Survey: 9 November 2000

Location of Survey (Lat/Lon) or UTM: 39° 29' 34.568 / 93° 16' 52.059

State: Missouri or Illinois

County: Carroll

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wooded wetland

Photo Number(s): 001W, 002 test pit, 003 N. sipidon, 004E

Is standing water present? Y N

Ground appears to be saturated: frequently temporarily/seasonally rarely n/a dug to 30cm

Was a test pit dug? Y/N If yes, depth to saturated soil (cm): no water

Estimated distance to nearest permanent body of water (m): 200m
Type of water body: lake/pond stream river

Are crayfish burrows present? Y/N If yes, estimated density (#/m²): .3/m²

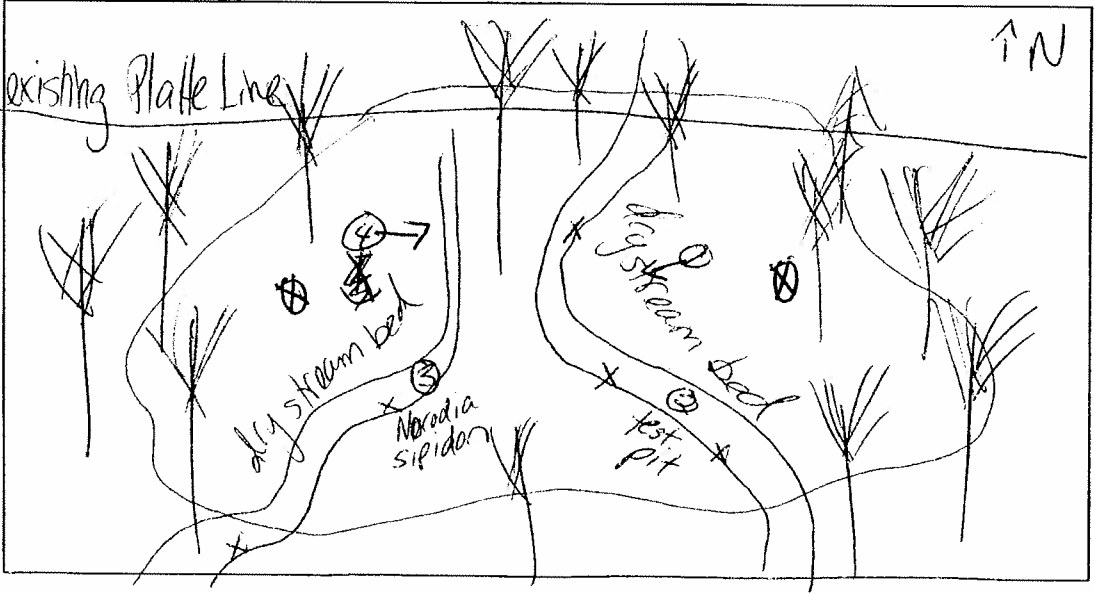
Describe other potential hibernacula present: n/a

Are there trees in the area? Y/N If yes, estimated percent canopy closure: 50 %
Dominant species (3): Ulmus americana

Circle one: Area is likely to support or not likely to support protected snake species

Explain: crayfish burrows present no standing water

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Wetland ID: NAT13 CI 001 MP: 629.47-629.57 (REX or KEY)

Surveyor(s): Becky Braeutigam, John Alexander Date of Survey: 11-8-06

Location of Survey (Lat/Lon or UTM): NA - site could not be accessed by foot

State: Missouri or Illinois

County: Chariton

Circle one: Feature occurs on

REX-West

Keystone

Both (co-located)

General description of site:

emergent → scrub/shrub → forested wetland along river

Photo Number(s): 001W

Is standing water present? Y / (N)

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N)

If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1

Type of water body: lake/pond

stream

trib. to Grand River

Are crayfish burrows present? (Y) N

Visible from opposite shore

If yes, estimated density (#/m²): 0.2

Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) N

If yes, estimated percent canopy closure: 30 %

Dominant species (3): Acer saccharinum, Platanus occidentalis, Quercus sp.

Circle one:

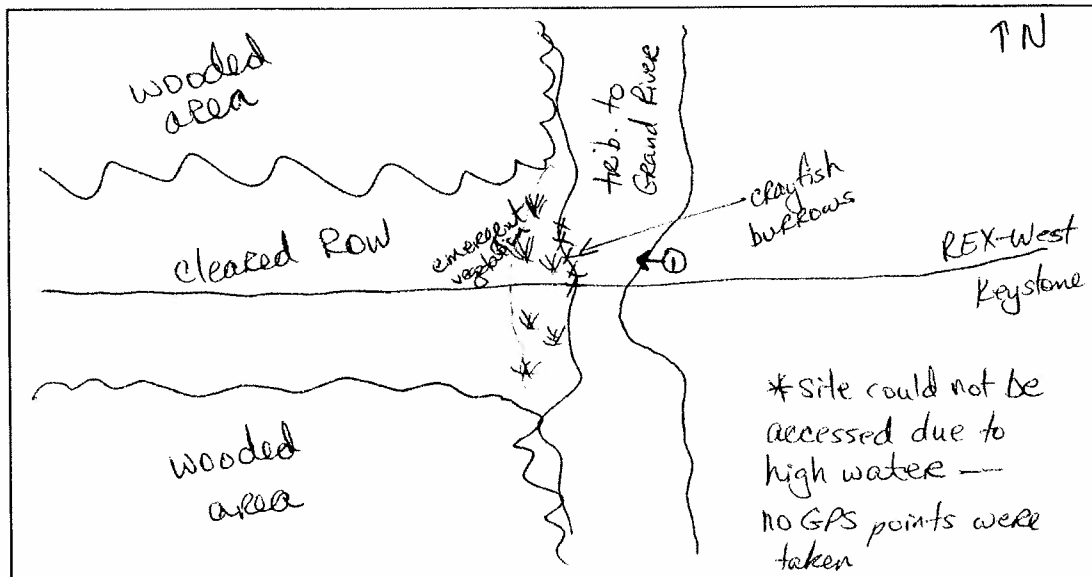
Area is likely to support or not likely to support

protected snake species

Explain:

crayfish burrows were observed from opposite bank, open canopy

Sketch of Survey Area (indicate mileposts):





Site Description Data Sheet

Feature/Wetland ID: NAT13CI002 MP: 629.57-629.67 (REX or KEY)

Surveyor(s): Becky Bearupgam, John Alexander Date of Survey: 11-8-06

Location of Survey (Lat/Lon or UTM): N 4387040.806 E 993109.241

State: MISSOURI or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: emergent wetland along river with ~20ft levee separating it in the middle Photo Number(s): 001E, 002W, 003E, 004S

Is standing water present? (Y) N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y/(N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1 Type of water body: lake/pond stream river trib to Grand River

Are crayfish burrows present? (Y) N If yes, estimated density (#/m^2): 0.5

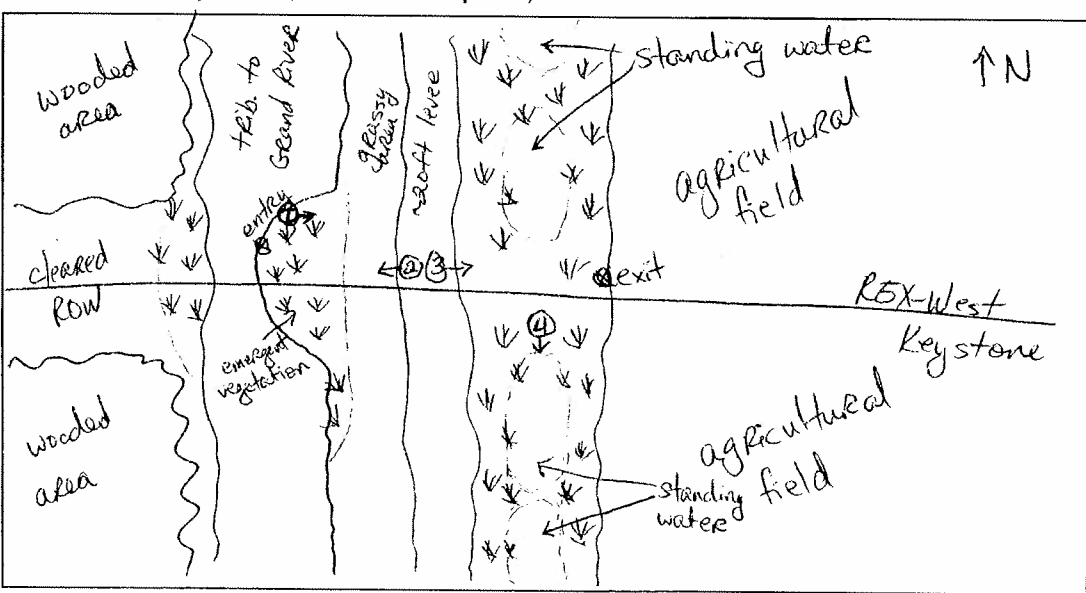
Describe other potential hibernacula present: n/a

Are there trees in the area? Y (N) If yes, estimated percent canopy closure: n/a % Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species Explain:

crayfish burrows, no canopy cover, moist soil

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT13CI003 MP: 630.00 (REX or KEY)

Surveyor(s): Becky Braentgam, John Alexander Date of Survey: 11-8-06

Location of Survey (Lat/Lon or UTM): N 4386968.301 E 993707.992

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland/ditch in agricultural field Photo Number(s): 001 E, 002 W, 003 N

Is standing water present? Y / N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1
Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): 0.6

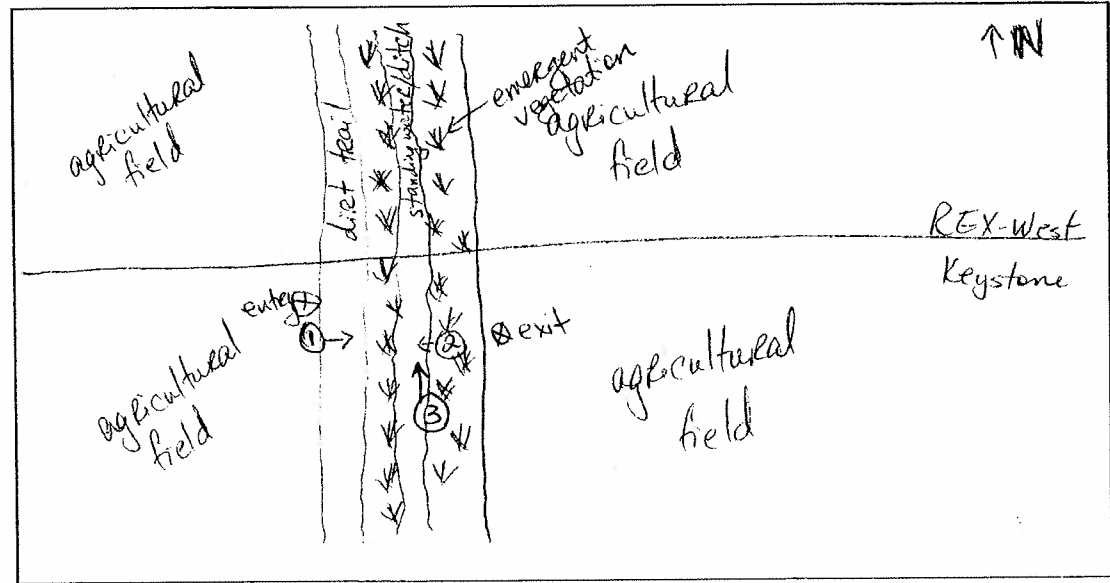
Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: n/a %
Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species
Explain:

crayfish burrows present, no canopy cover

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT13CE004 MP: 630.17-630.27 (REX or KEY)

Surveyor(s): Becky Braentigam, John Alexander Date of Survey: 11-8-06

Location of Survey (Lat/Lon or UTM): N 4386945.317 E 994073.752

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland/ditch in agricultural field Photo Number(s): 001E, 002N

Is standing water present? Y N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1 Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): 0.4

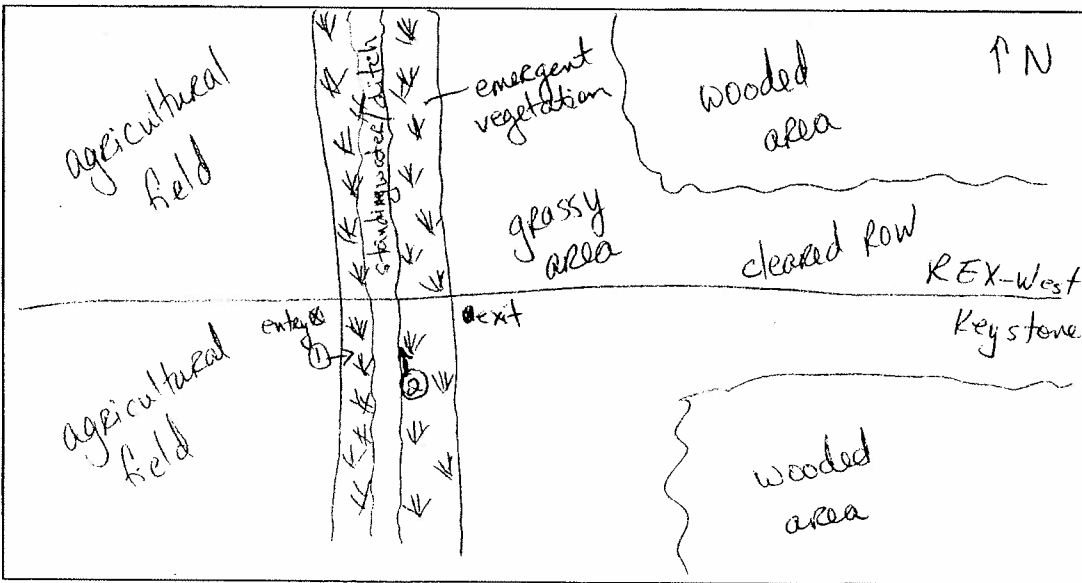
Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: n/a % Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species Explain:

crayfish burrows, no canopy cover

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT13CI005 MP: 630.27-630.97 (REX or KEY)

Surveyor(s): Becky Beaentigam, John Alexander Date of Survey: 11-8-06

Location of Survey (Lat/Lon or UTM): N4386940.216 E994563.354

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: woodlot with cleared ROW surrounded by agricultural fields Photo Number(s): 001W

Is standing water present? Y (N) Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? (Y) N If yes, depth to saturated soil (cm): N/A not saturated at 12 in depth

Estimated distance to nearest permanent body of water (m): 50 Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m^2): N/A

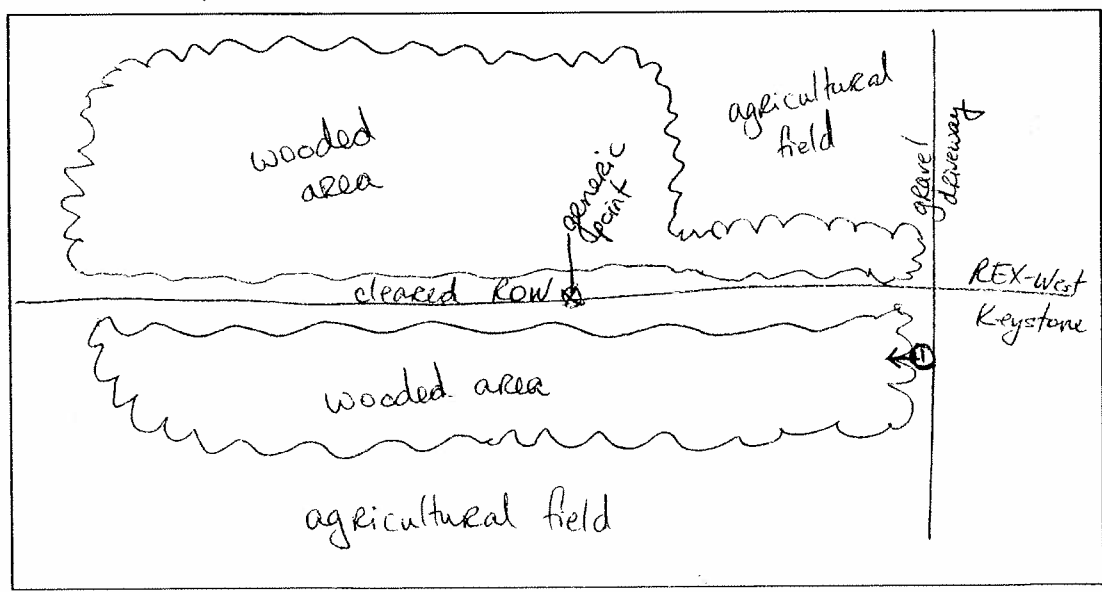
Describe other potential hibernacula present: N/A

Are there trees in the area? (Y) N If yes, estimated percent canopy closure: 50% Dominant species (3): Quercus Rubra

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows present, soil is dry

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT13CI006 MP: 630.97-631.27 (REX) or KEY)

Surveyor(s): Becky Beaufort, John Alexander Date of Survey: 11-8-06

Location of Survey (Lat/Lon or UTM): N 4386883.760 E 995523.190

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland/ditch in agricultural field Photo Number(s): 001W, 002E

Is standing water present? (Y) N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1 Type of water body: lake/pond stream river

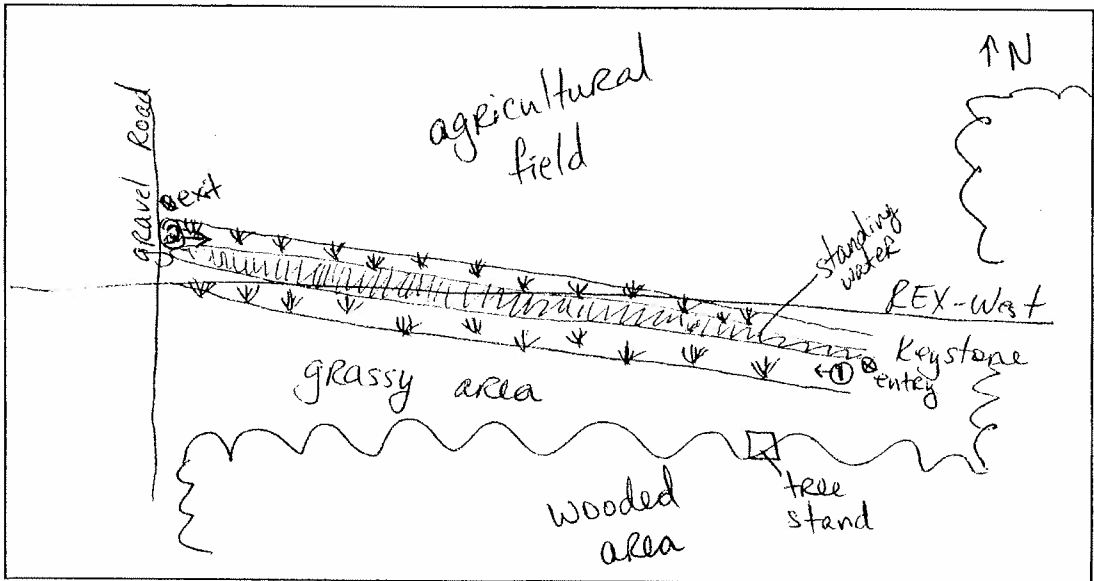
Are crayfish burrows present? (Y) N If yes, estimated density (#/m^2): 0.8

Describe other potential hibernacula present: n/a

Are there trees in the area? Y (N) If yes, estimated percent canopy closure: n/a % Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species Explain: crayfish burrows, no canopy cover

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT13CI007 MP: 631.37 (REX or KEY)

Surveyor(s): Becky Beaufort, John Alexander Date of Survey: 11-8-06

Location of Survey (Lat/Lon or UTM): N4386923.685 E995929.420

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: emergent/scrub-shrub/forested wetland Photo Number(s): 10-BAS 001 W, 002 E

Is standing water present? Y / (N) Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 50 Type of water body: lake/pond stream river

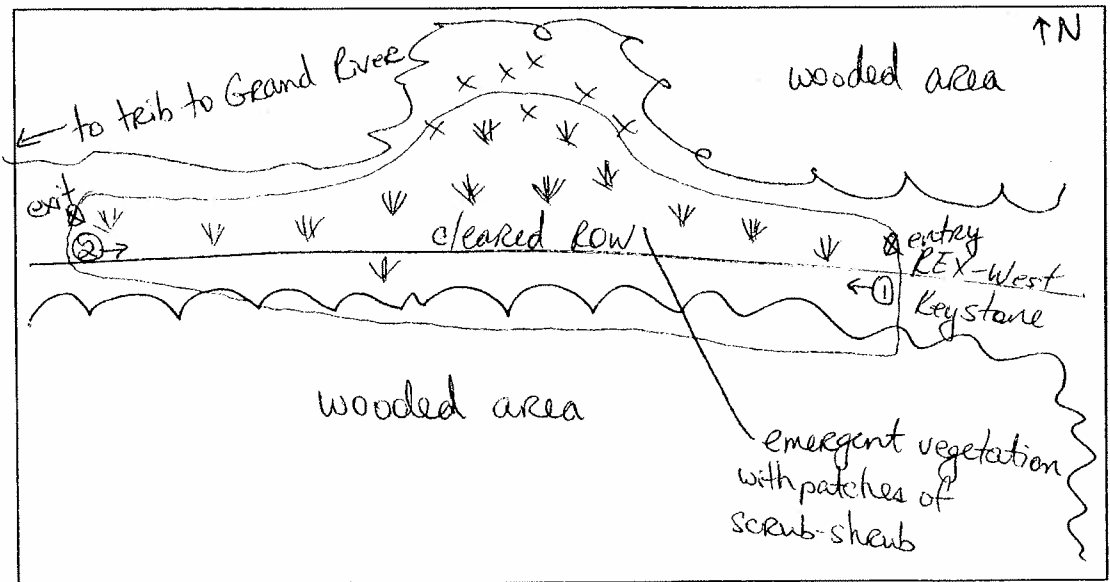
Are crayfish burrows present? (Y) / N If yes, estimated density (#/m^2): 0.2

Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) / N If yes, estimated percent canopy closure: 50 % Dominant species (3): Ulmus americana, Quercus rubra, Ulmus rubra

Circle one: Area is likely to support or not likely to support protected snake species Explain: crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT 13 CI 008 MP: 635.37-635.47 (REX) or KEY)

Surveyor(s): Becky Braentigan, John Alexander Date of Survey: 11-9-06

Location of Survey (Lat/Lon or UTM): N 4386304.103 E 1002411.112

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland w/in patchy woodlot surrounded by pasture Photo Number(s): 0015, 0021

Is standing water present? (Y) / N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1 Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) / N If yes, estimated density (#/m²): 0.3

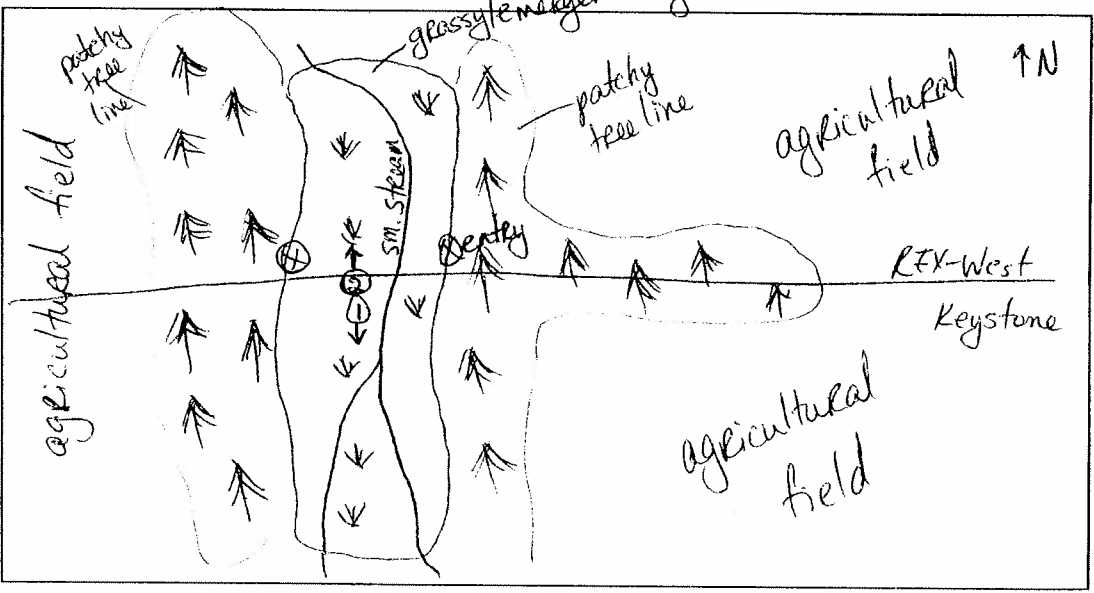
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) / N If yes, estimated percent canopy closure: 30 % Dominant species (3): Ulmus americana, Quercus rubra, Gleditsia triacanthos

Circle one: Area is likely to support or not likely to support protected snake species Explain:

crayfish burrows present, fairly open canopy

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT13CI009 MP: 637.87-637.97 (REX or KEY)

Surveyor(s): Becky Berentigan, John Alexander Date of Survey: 11-9-06

Location of Survey (Lat/Lon or UTM): N 4386050.101 E 1006394.513

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: Photo Number(s): 0015

farm pond in pasture

Is standing water present? Y / N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1
Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): n/a

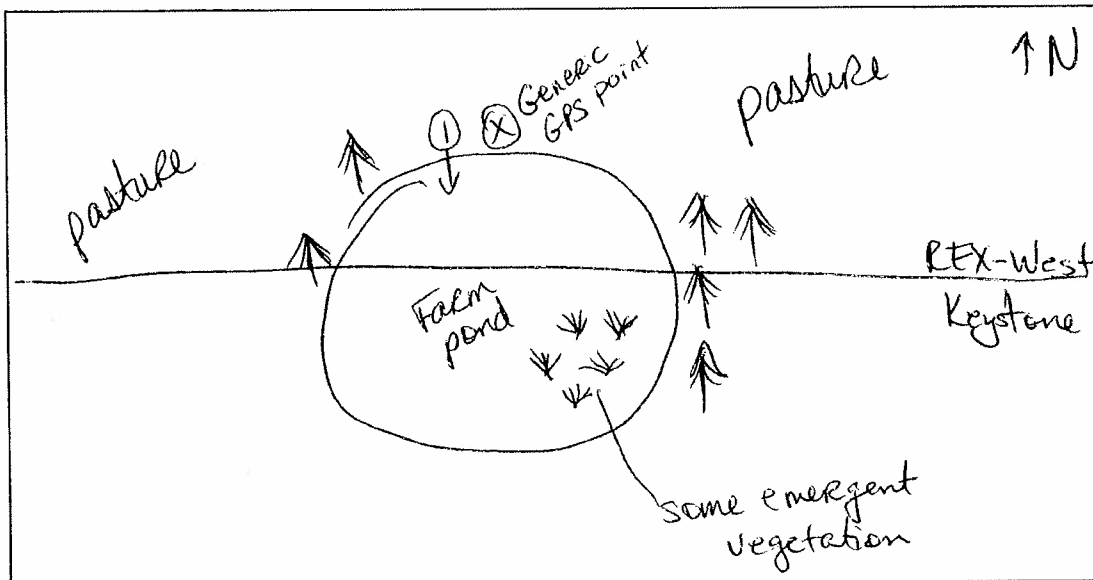
Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: 10 %
Dominant species (3): Gleditsia triacanthos

Circle one:
Area is likely to support or not likely to support protected snake species
Explain:

no crayfish burrows, heavily trafficked by cattle

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT 13 CI 010 MP: 638-97-639.07 (REX or KEY)

Surveyor(s): Becky Berentzgam, John Alexander Date of Survey: 11-9-06

Location of Survey (Lat/Lon or UTM): N 4385984.068 E 1008267.480

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: farm pond in pasture Photo Number(s): 0013

Is standing water present? Y / N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1

Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

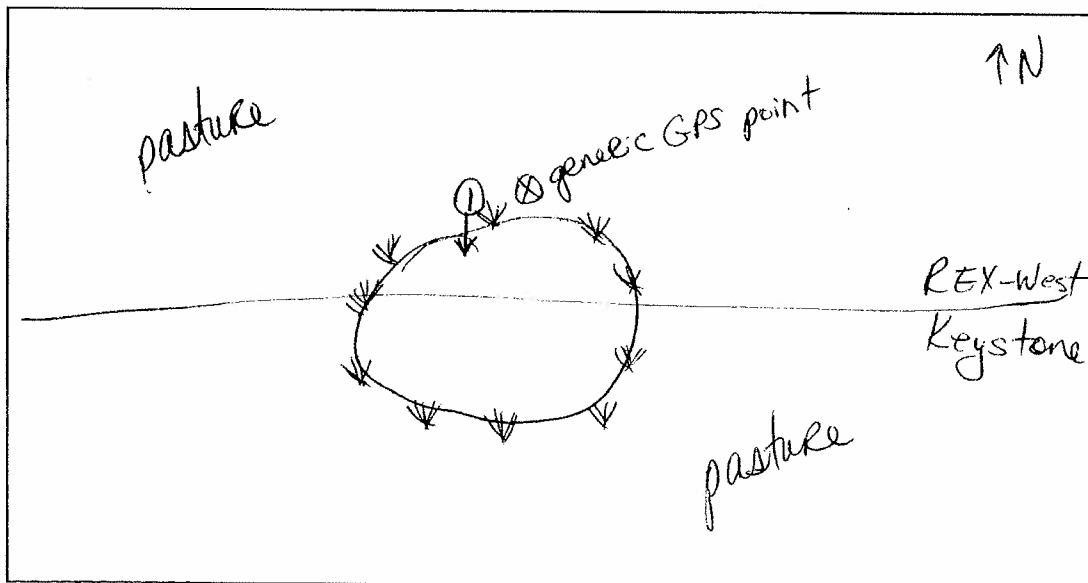
Are there trees in the area? Y / N If yes, estimated percent canopy closure: n/a %

Dominant species (3): n/a

Circle one: likely to support ^{BAR} or not likely to support protected snake species
Explain:

no crayfish burrows, heavily trafficked by cattle

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT 13 CE 011 MP: 641.77-641.87 (REX or KEY)

Surveyor(s): Becky Beasly, John Alexander Date of Survey: 11-9-06

Location of Survey (Lat/Lon or UTM): N4385605.052 E1012692.963

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: emergent/forested wetland in agricultural field

Photo Number(s): 001E, 002 test pit

Is standing water present? Y (N)
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? (Y) / N If yes, depth to saturated soil (cm): NA ^{not saturated at 12 in depth}

Estimated distance to nearest permanent body of water (m): 700
Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m²): NA

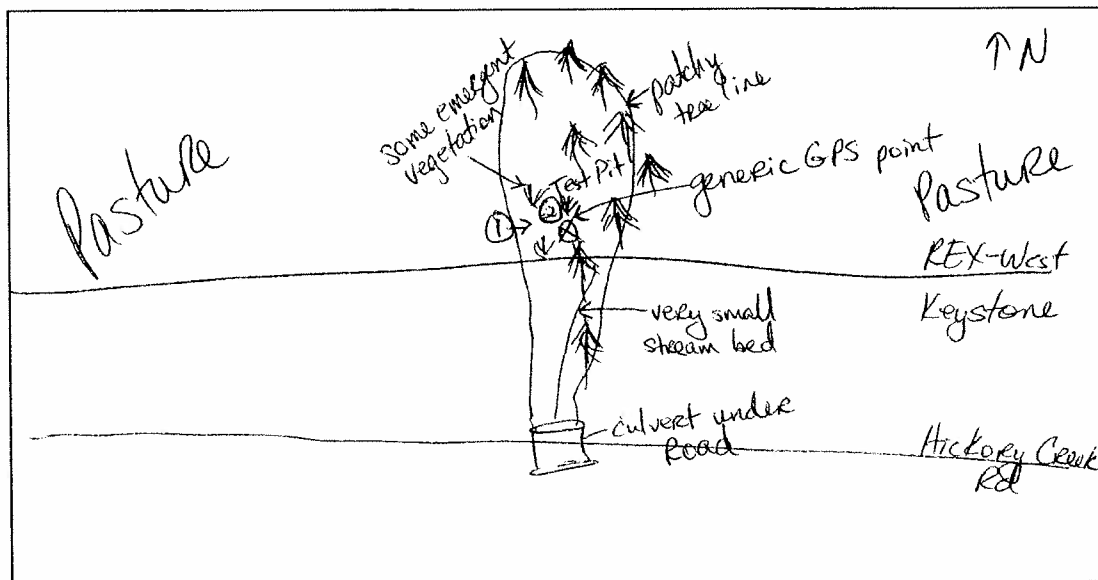
Describe other potential hibernacula present: NA

Are there trees in the area? (Y) N If yes, estimated percent canopy closure: 40 %
Dominant species (3): Quercus Rubra, Ulmus americana

Circle one: Area is likely to support or not likely to support protected snake species

Explain: no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT13 CI 012 MP: 642.67-642.77 (REX or KEY)

Surveyor(s): Leahy Beentham, John Alexander Date of Survey: 11-9-06

Location of Survey (Lat/Lon or UTM): N4385414.836 E1014223.517

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: emergent wetland along ditch in agricultural field Photo Number(s): 001 E, 002 Test Pit

Is standing water present? (Y) N

Ground appears to be saturated: frequently temporarily/seasonally rarely not saturated Was a test pit dug? (Y) N If yes, depth to saturated soil (cm): n/a at 22 in depth

Estimated distance to nearest permanent body of water (m): 1 Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m^2): n/a

Describe other potential hibernacula present: n/a

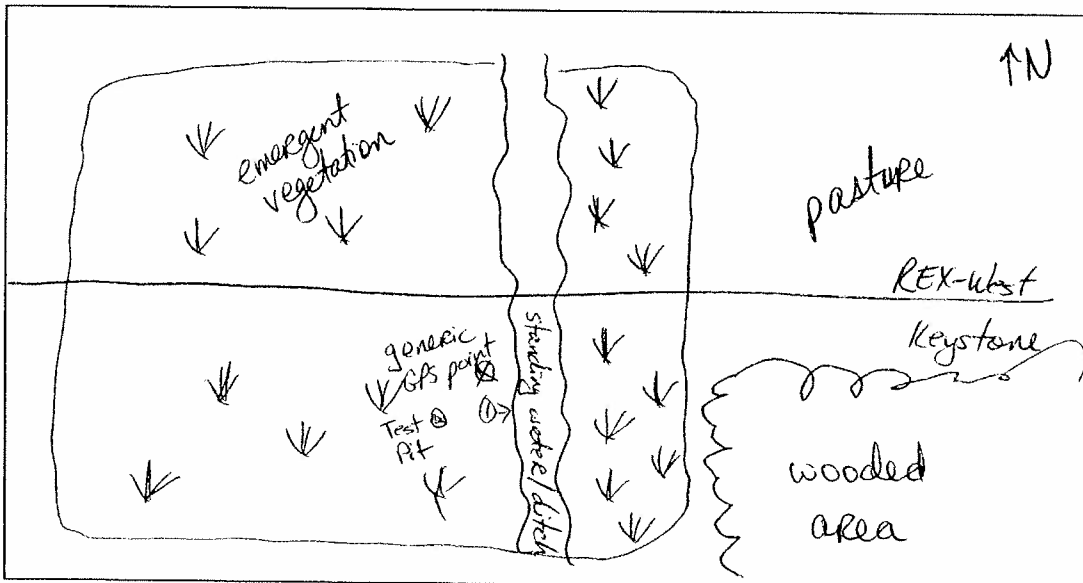
Are there trees in the area? Y (N) If yes, estimated percent canopy closure: n/a %

Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows

Sketch of Survey Area (indicate mileposts):





Site Description Data Sheet

Feature/Wetland ID: NAT 13 CI 013 MP: 645.67-645.77 (REX or KEY)

Surveyor(s): Becky Braentjgam, John Alexander Date of Survey: 11-9-06

Location of Survey (Lat/Lon or UTM): N 43 84436.053 E 1019017.182

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: low area in agricultural field Photo Number(s): 001W 002 Test Pit

Is standing water present? Y (N) Ground appears to be saturated: frequently temporarily/seasonally rarely Was a test pit dug? (Y) N If yes, depth to saturated soil (cm): n/a not saturated at 32 in depth

Estimated distance to nearest permanent body of water (m): 300 Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m^2): n/a

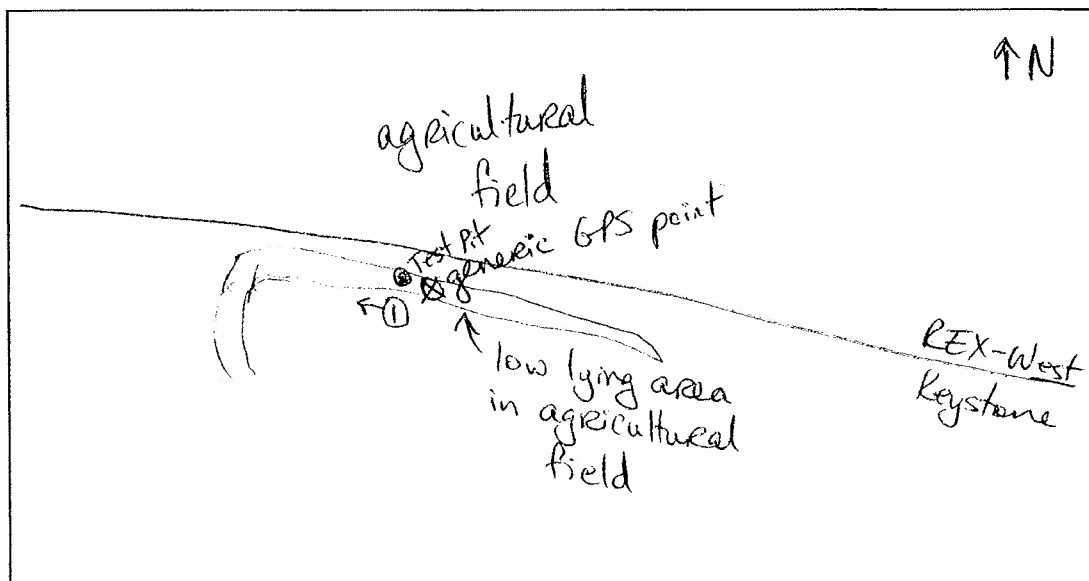
Describe other potential hibernacula present: n/a

Are there trees in the area? Y (N) If yes, estimated percent canopy closure: n/a % Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows, actively farmed

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT13CI014 MP: 645.97-646.07 (REX) or KEY)

Surveyor(s): Becky Braeutigam, John Alexander Date of Survey: 11-9-06

Location of Survey (Lat/Lon of UTM): N4384371.989 E1019378.775

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: Emergent/forested wetland surrounding stream Photo Number(s): 001N, 002W, 003W

Is standing water present? (Y) / N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1 Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) / N If yes, estimated density (#/m²): 0.7

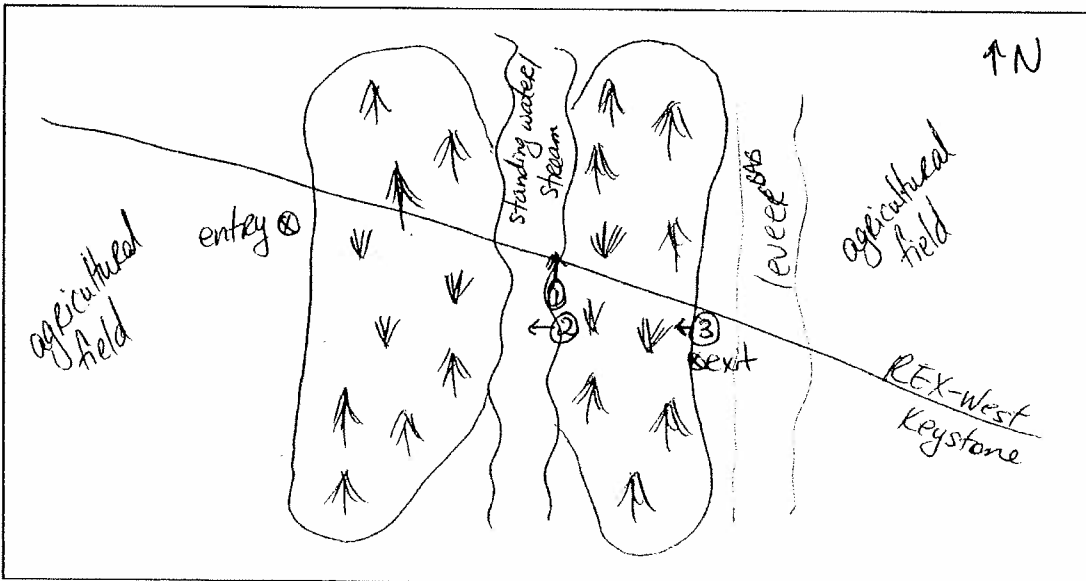
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) / N If yes, estimated percent canopy closure: 40 % Dominant species (3): Ulmus americana, Quercus rubra, Acer saccharinum

Circle one: Area is likely to support or not likely to support protected snake species Explain:

crayfish burrows, open canopy

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT13CI015 MP: 646-37 (REX) or KEY)

Surveyor(s): Becky Braentham, John Alexander Date of Survey: 11-9-06

Location of Survey (Lat/Lon of UTM): N4384173.679 E1019897.317

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: ditches along levee in agricultural field Photo Number(s): 001W, 002S, 003W

Is standing water present? Y / (N)
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 700
Type of water body: lake/pond stream river

Are crayfish burrows present? Y / (N) If yes, estimated density (#/m²): n/a

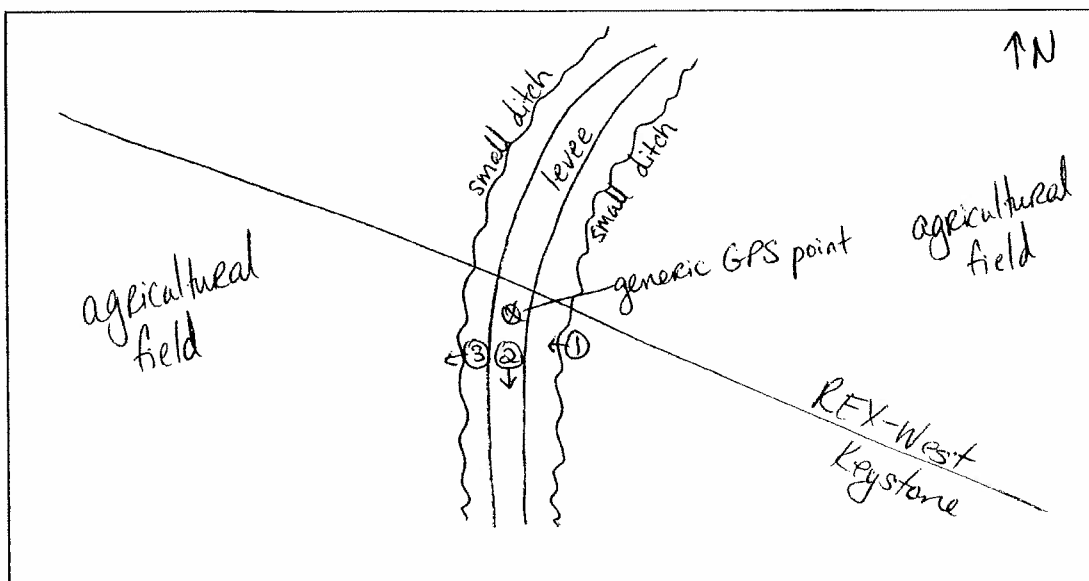
Describe other potential hibernacula present: n/a

Are there trees in the area? Y / (N) If yes, estimated percent canopy closure: n/a %
Dominant species (3): n/a

Circle one:
Area is likely to support or not likely to support protected snake species
Explain:

no crayfish burrows, just field drainage ditches

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Feature/Wetland ID: NAT13 CI 016 MP: 646.87-646.97 (REX or KEY)

Surveyor(s): Rocky Braeutigam, John Alexander Date of Survey: 11-9-06

Location of Survey (Lat/Lon or UTM): N4383972.403 E1020705.996

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: Farm pond in woodlot surrounded by pasture Photo Number(s): 001W, 002N

Is standing water present? (Y) N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1
Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) N If yes, estimated density (#/m²): 0.4

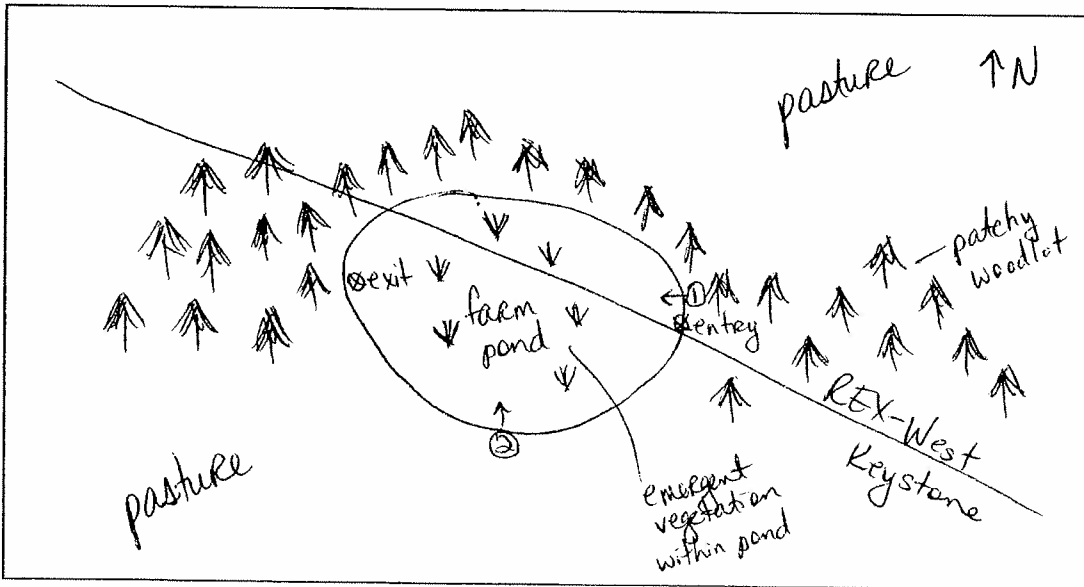
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) N If yes, estimated percent canopy closure: 20 %
Dominant species (3): Gleditsia triacanthos, Quercus rubra, Juniperus virginiana

Circle one: Area is likely to support or not likely to support protected snake species

Explain: crayfish burrows

Sketch of Survey Area (indicate mileposts):





Site Description Data Sheet

Feature/Wetland ID: NAT13CI017 MP: 648.37-648.47 (REX or KEY)

Surveyor(s): Becky Braentigam, John Alexander Date of Survey: 11-9-06

Location of Survey (Lat/Lon or UTM): N4383129.477 E1022976.519

State: Missouri or Illinois County: Chaeton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: emergent vegetation along edge of faem ponds in pasture

Photo Number(s): 001W, 002S

Is standing water present? Y (N)

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 5

Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

Are there trees in the area? Y (N) If yes, estimated percent canopy closure: n/a %

Dominant species (3): n/a

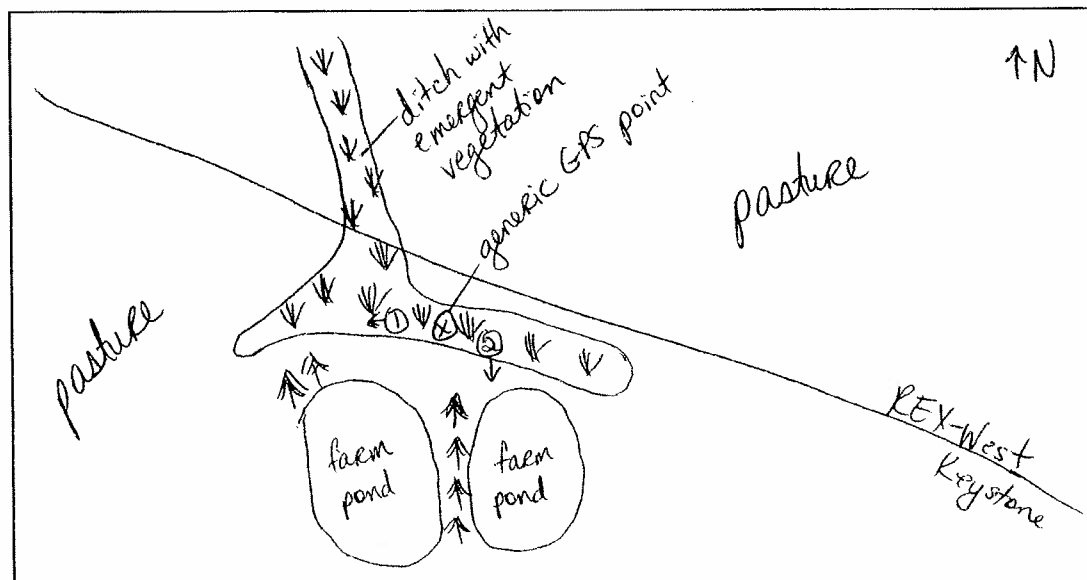
Circle one:

Area is likely to support or not likely to support protected snake species

Explain:

no crayfish burrows

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Wetland ID: NAT13 CI 021 MP: 650.97-651.07 (REX or KEY)

Surveyor(s): Becky Braeutigam, John Alexander Date of Survey: 11-10-06

Location of Survey (Lat/Lon or UTM): N 43811663.534 E 1026912.646

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: Forested wetland in woodlot surrounded by agricultural fields Photo Number(s): 001s, 002 Test Pit

Is standing water present? Y/N Ground appears to be saturated: frequently temporarily/seasonally rarely not saturated Was a test pit dug? Y/N If yes, depth to saturated soil (cm): n/a at 12 in depth

Estimated distance to nearest permanent body of water (m): 100 Type of water body: lake/pond stream river Chariton River

Are crayfish burrows present? Y/N If yes, estimated density (#/m^2): n/a

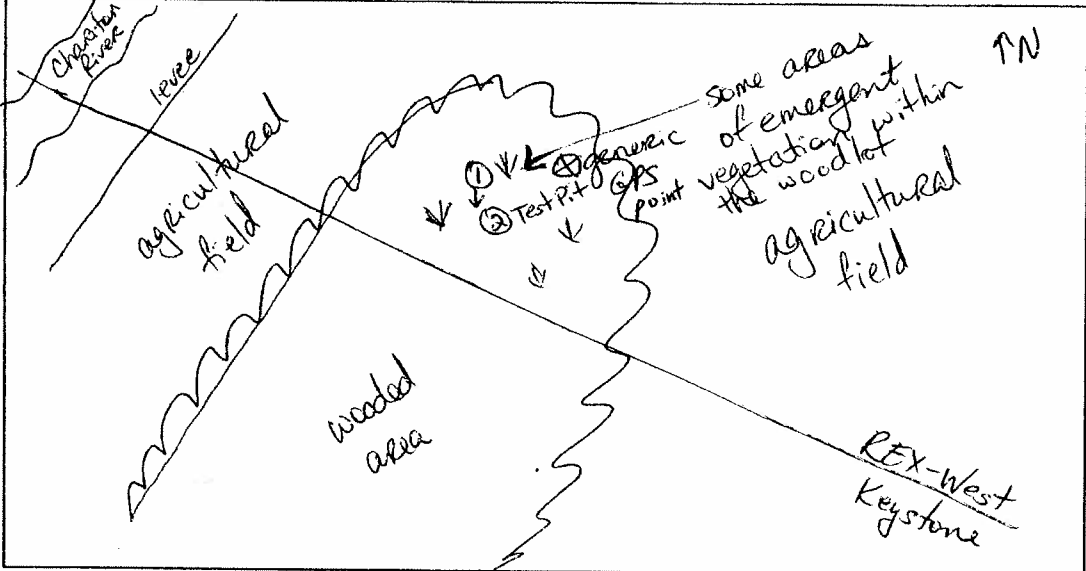
Describe other potential hibernacula present: n/a

Are there trees in the area? Y/N If yes, estimated percent canopy closure: 40% Dominant species (3): Acee saccharinum

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Wetland ID: NAT 13 CI 022 MP: 651.17-651.37 (REX or KEY)

Surveyor(s): Becky Brautigam, John Alexander Date of Survey: 11-10-06

Location of Survey (Lat/Lon or UTM): N 4381496.429 E 1027351.885

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: woodlot in agricultural field Photo Number(s): 001E, 002 test pit

Is standing water present? Y/N (N) Ground appears to be saturated: frequently temporarily/seasonally rarely not saturated Was a test pit dug? Y/N (Y) If yes, depth to saturated soil (cm): n/a at 12 in depth

Estimated distance to nearest permanent body of water (m): 800 Type of water body: lake/pond stream river Chariton River

Are crayfish burrows present? Y/N (N) If yes, estimated density (#/m^2): n/a

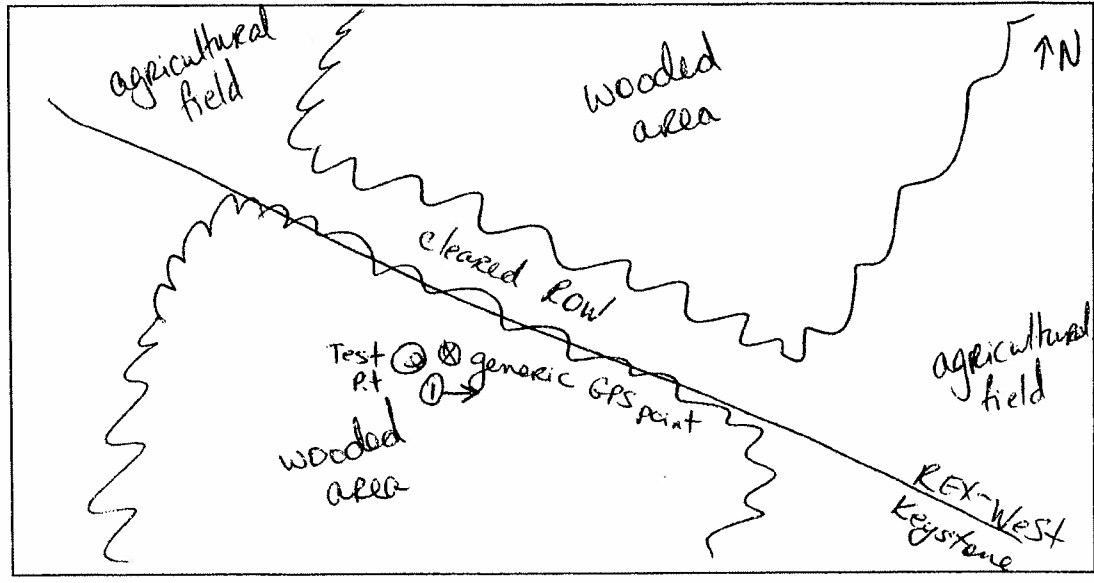
Describe other potential hibernacula present: n/a

Are there trees in the area? Y/N (Y) If yes, estimated percent canopy closure: 50 % Dominant species (3): Acer saccharinum, Ulmus Rubra

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows

Sketch of Survey Area (indicate mileposts):



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Site Description Data Sheet

Wetland ID: NAT13CF023 MP: 651.47-651.57 (REX or KEY)

Surveyor(s): Becky Beautigam, John Alexander Date of Survey: 11-10-06

Location of Survey (Lat/Lon or UTM): N4381320.864 E1027754.576

State: Missouri or Illinois County: Chaeiton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: Ditch with tree line to west & agricultural field to east Photo Number(s): 001N

Is standing water present? Y / (N) Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1,100 Type of water body: lake/pond stream river Chaeiton River

Are crayfish burrows present? Y / (N) If yes, estimated density (#/m²): n/a

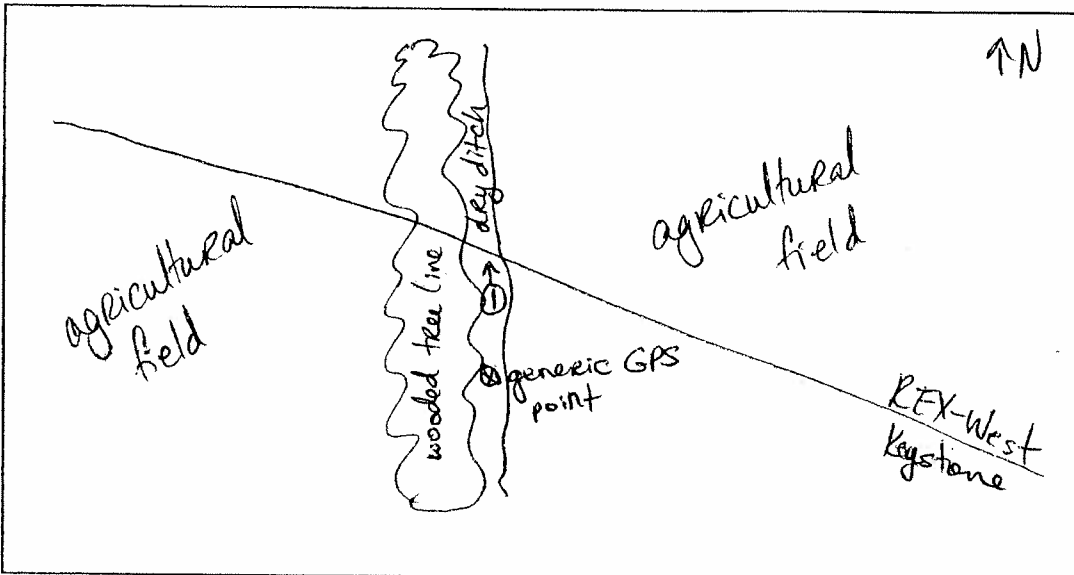
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) N If yes, estimated percent canopy closure: 40 % Dominant species (3): Acer saccharinum, Quercus rubra

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows present

Sketch of Survey Area (indicate mileposts):





Site Description Data Sheet

Wetland ID: NAT13 CI 025 MP: 659.47-659.57 (REX or KEY)

Surveyor(s): Becky Braeutgam, John Alexander Date of Survey: 11-10-06

Location of Survey (Lat/Lon or UTM): N 4379223.479 E 1040249.465

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wooded ditch with pasture surrounding Photo Number(s): 004W

Is standing water present? Y (N) Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 500 Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m²): n/a

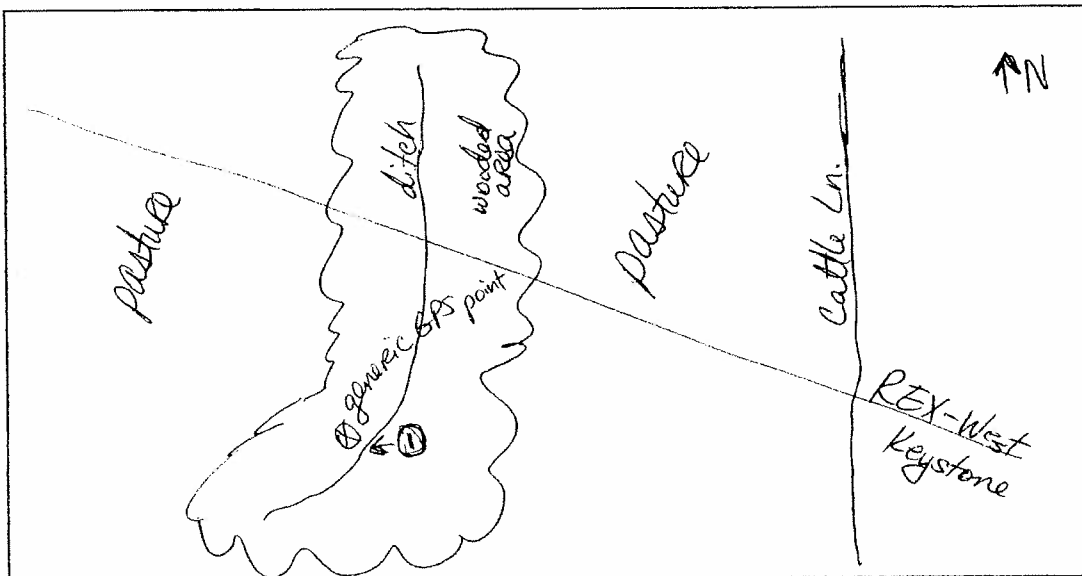
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) N If yes, estimated percent canopy closure: 60 % Dominant species (3): Acer saccharinum, Quercus eubea

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows, relatively closed canopy

Sketch of Survey Area (indicate mileposts):





Site Description Data Sheet

Wetland ID: NAT13 CI 026 MP: 660.17-660.27 (REX or KEY)

Surveyor(s): Becky Braeutgam, John Alexander Date of Survey: 11-10-06

Location of Survey (Lat/Lon or UTM): N4379150.873 E1041453.834

State: Missouri or Illinois County: Chariton

Circle one: Feature occurs on REX-West Keystone Both (co-located)

General description of site: wetland (emergent) along retention pond Photo Number(s): 001W

Is standing water present? (Y) N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y/N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1 Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) N If yes, estimated density (#/m^2): 4

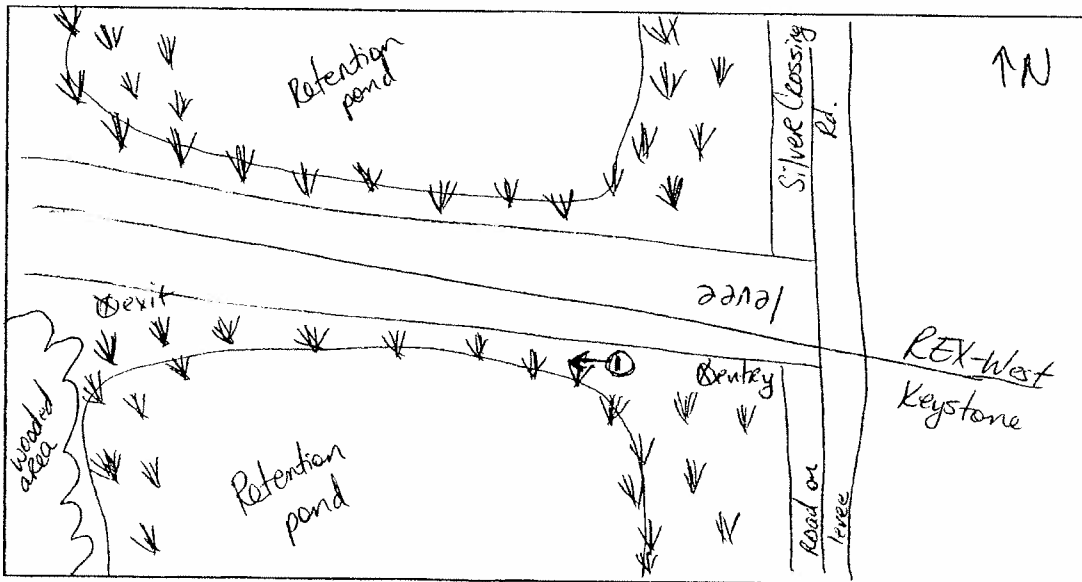
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) N If yes, estimated percent canopy closure: 10% Dominant species (3): Quercus rubra

Circle one: Area is likely to support or not likely to support protected snake species Explain:

abundant crayfish burrows

Sketch of Survey Area (indicate mileposts):





Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13MOSC001 MP: 985.30-986.00

Surveyor(s): Becky Braentjans, John Alexander Date of Survey: 11-13-06

Location of Survey (Lat/Lon or UTM): N4337975.346 E1218263.244

State: Missouri or Illinois County: St. Charles

General description of site:

Forested wetland w/ man-made wetland ponds

Photo Number(s): 001W,
002N, 003E

Is standing water present? (Y) / N

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1

Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) / N If yes, estimated density (#/m²): 0.2

Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) / N If yes, estimated percent canopy closure: 40 %

Dominant species (3): Quercus rubra, Ulmus rubra, Acer saccharinum

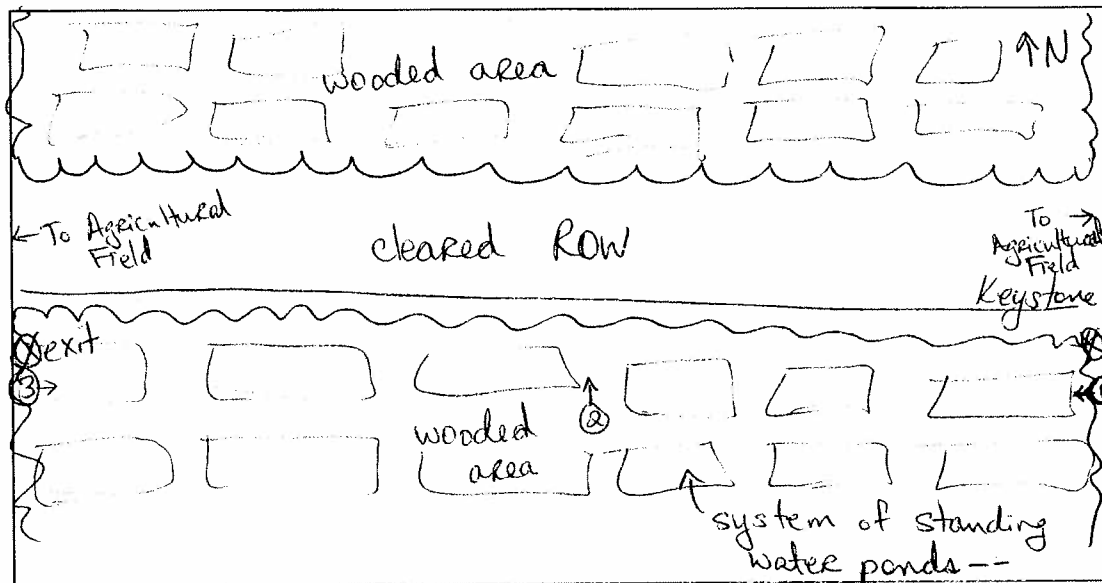
Circle one:

Area is likely to support or not likely to support protected snake species

Explain:

crayfish burrows, open canopy along pond divisions

Sketch of Survey Area (indicate mileposts):



presumably for hunting ducks

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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NAT8H13 MOSC 004

MP: 988.30-988.70

Surveyor(s): Rocky Braeutigam, John Alexander Date of Survey: 11-13-06

Location of Survey (Lat/Lon or UTM): N 43373595.253 E 1222868.325

State: Missouri or Illinois

County: St Charles

General description of site: man-made pond system in agricultural field

Photo Number(s): 001W

Is standing water present? (Y) / N

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1

Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

Are there trees in the area? Y (N) If yes, estimated percent canopy closure: n/a %

Dominant species (3): n/a

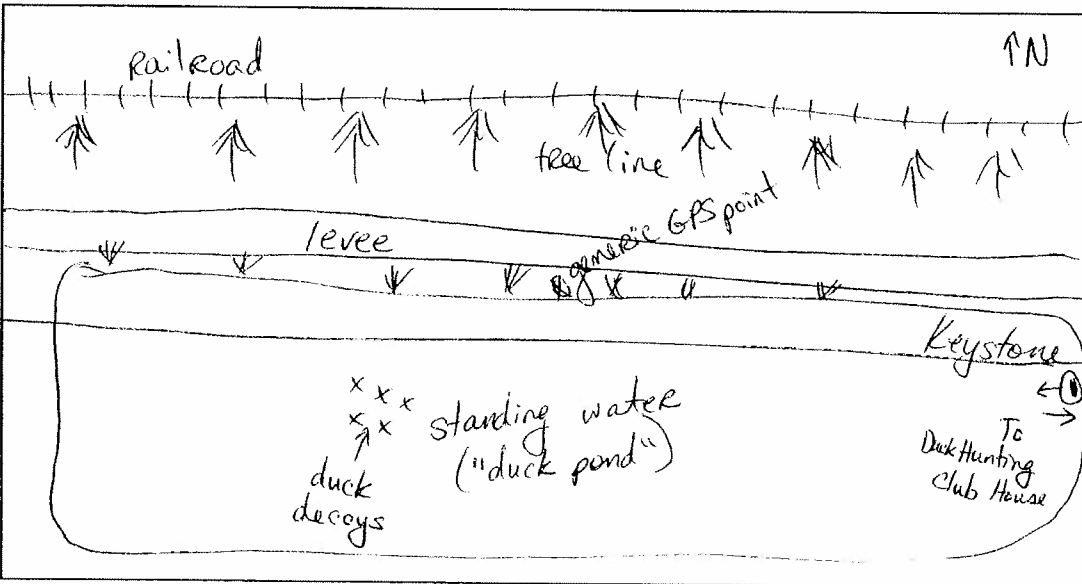
Circle one:

Area is likely to support or not likely to support protected snake species

Explain:

no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Wetland ID: NATB413MOSCOPUS MP: 989.00 - 989.30

Surveyor(s): Becky Beaufort, John Alexander Date of Survey: 11-3-06

Location of Survey (Lat/Lon or UTM): N 4337040.535 E 1223736.237

State: Missouri or Illinois

County: St. Charles

General description of site:

PEM around duck pond transitioning into PFO

Photo Number(s): 001W 002E

Is standing water present? (Y) / N

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1

Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) / N If yes, estimated density (#/m^2): 0.3

Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: %

Dominant species (3): Quercus macrocarpa, Quercus rubra, Acer saccharinum

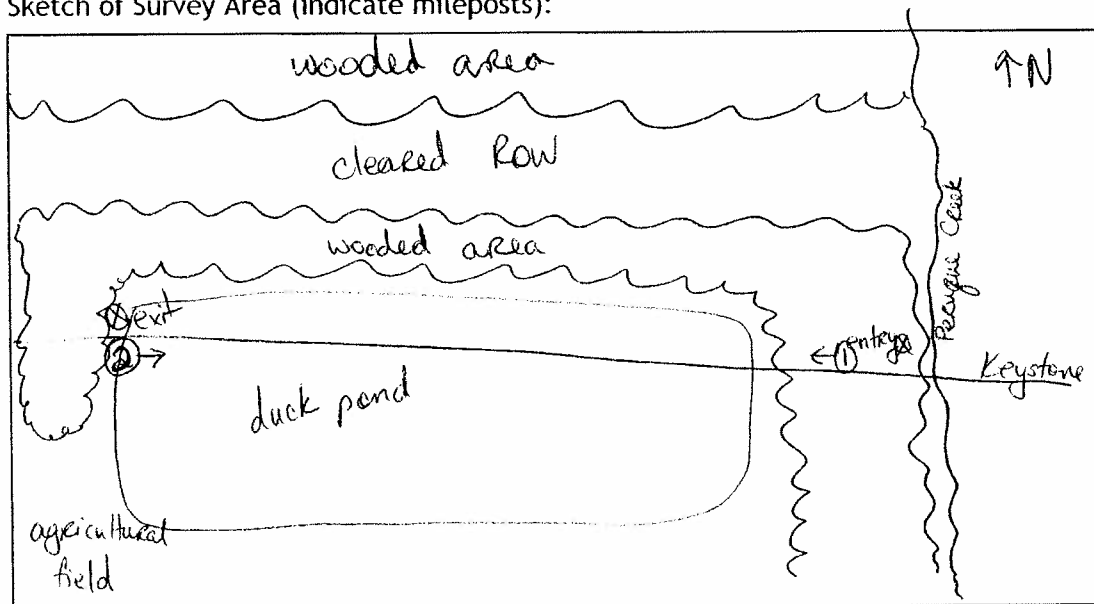
Circle one:

Area is likely to support or not likely to support protected snake species

Explain:

crayfish burrows present, open canopy

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13H05C006 MP: 989.40-989.50

Surveyor(s): Becky Braeutigam, John Alexander Date of Survey: 11-13-06

Location of Survey (Lat/Lon or UTM): N 4336883.307 E 1224213.405

State: Missouri or Illinois County: St. Charles

General description of site: ditch & open water along either side of levee Photo Number(s): 001E

Is standing water present? (Y) N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 7 Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m^2): n/a

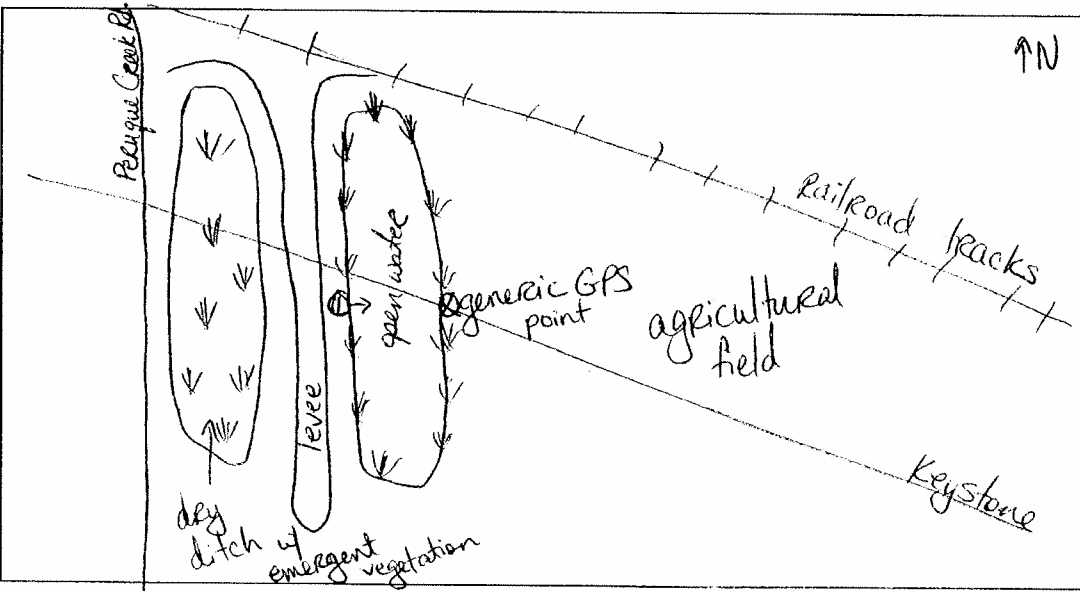
Describe other potential hibernacula present: n/a

Are there trees in the area? Y (N) If yes, estimated percent canopy closure: n/a % Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows present, heavily trampled by deer

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13MOSC007 MP: 989.60

Surveyor(s): Becky Beaufort, John Alexander Date of Survey: 11-13-06

Location of Survey (Lat/Lon or UTM): N4336765.021 E1224475.507

State: Missouri or Illinois County: St. Charles

General description of site: emergent vegetation within corn field Photo Number(s): 001E

Is standing water present? Y/N (N) Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y/N (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 30 Type of water body: lake/pond stream river

Are crayfish burrows present? Y/N (N) If yes, estimated density (#/m^2): n/a

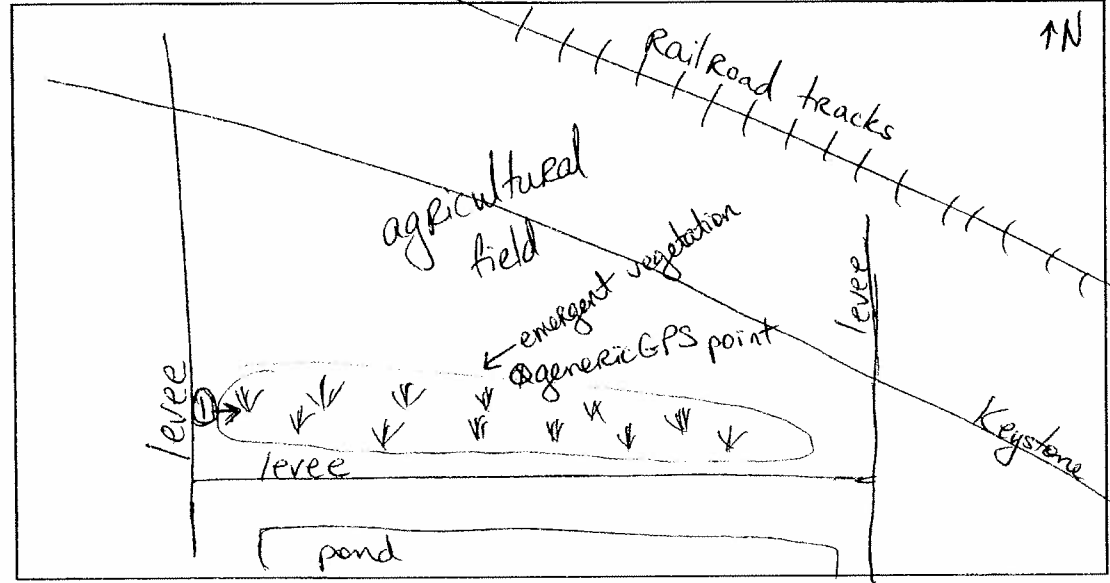
Describe other potential hibernacula present: n/a

Are there trees in the area? Y/N (N) If yes, estimated percent canopy closure: n/a % Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NAT BA13MOSC008 MP: 989.70

Surveyor(s): Rocky Braeutigam, John Alexander Date of Survey: 11-13-06

Location of Survey (Lat/Lon or UTM): N4336728.339 E1224577.655

State: Missouri or Illinois County: St. Charles

General description of site: wetland surrounded by agricultural fields Photo Number(s): DD1W, 002E

Is standing water present? Y / N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 25 Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): 0.3

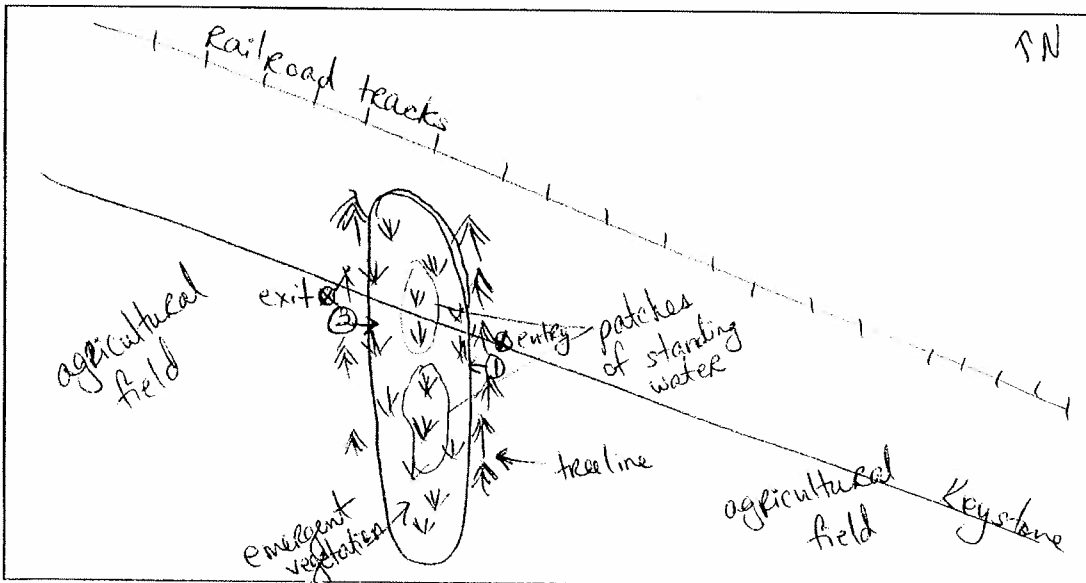
Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: 10 % Dominant species (3): Gleditsia triacanthos

Circle one: Area is likely to support or not likely to support protected snake species Explain:

crayfish burrows present, open canopy

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Wetland ID: NATBH13MOSC009 MP: 991.50 - 991.70

Surveyor(s): Becky Barentzgam, John Alexander Date of Survey: 11-14-06

Location of Survey (Lat/Lon or UTM): N 4335681.226 E 1227560.666

State: Missouri or Illinois County: St Charles

General description of site: pond surrounded by PFO Photo Number(s): 001N

Is standing water present? (Y) N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1
Type of water body: lake/pond stream river

Are crayfish burrows present? Y / (N) If yes, estimated density (#/m²): n/a

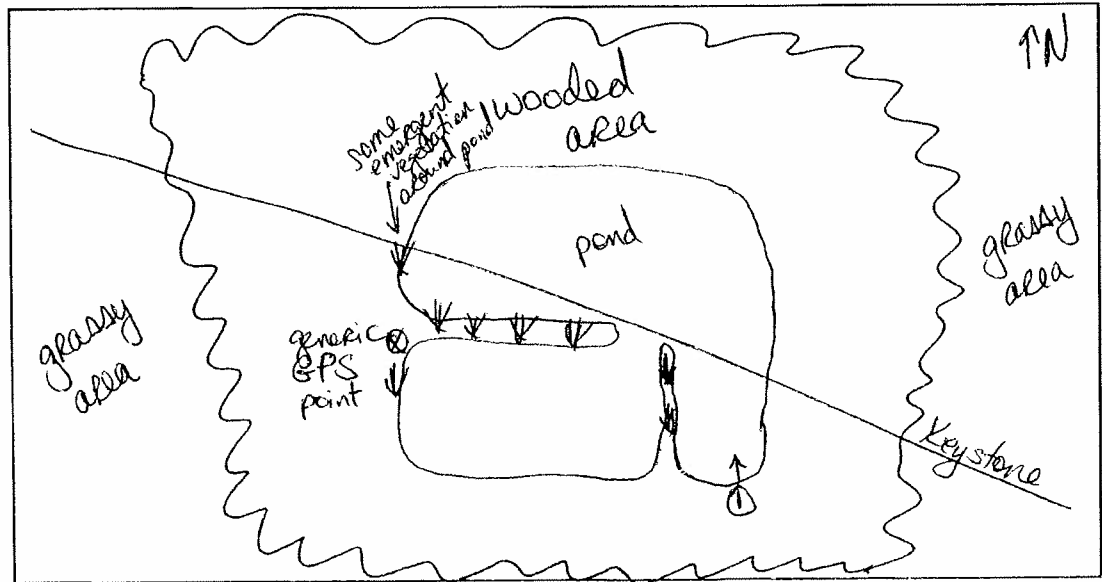
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) N If yes, estimated percent canopy closure: 70 %
Dominant species (3): Quercus fubea, Ulmus americana, Gleditsia triacanthos

Circle one:
Area is likely to support or not likely to support protected snake species

Explain: no crayfish burrows, fairly dense canopy cover

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13HOSC010 MP: 995.70-995.80

Surveyor(s): Becky Beatty, John Alexander Date of Survey: 11-14-06

Location of Survey (Lat/Lon or UTM): N4334350.183 E1233832.579

State: Missouri or Illinois County: St. Charles

General description of site: emergent vegetation along creek Photo Number(s): 001N -- photo is incorrectly labeled on white board as 001W

Is standing water present? (Y) / N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1 Type of water body: lake/pond stream river

Are crayfish burrows present? Y / (N) If yes, estimated density (#/m²): n/a

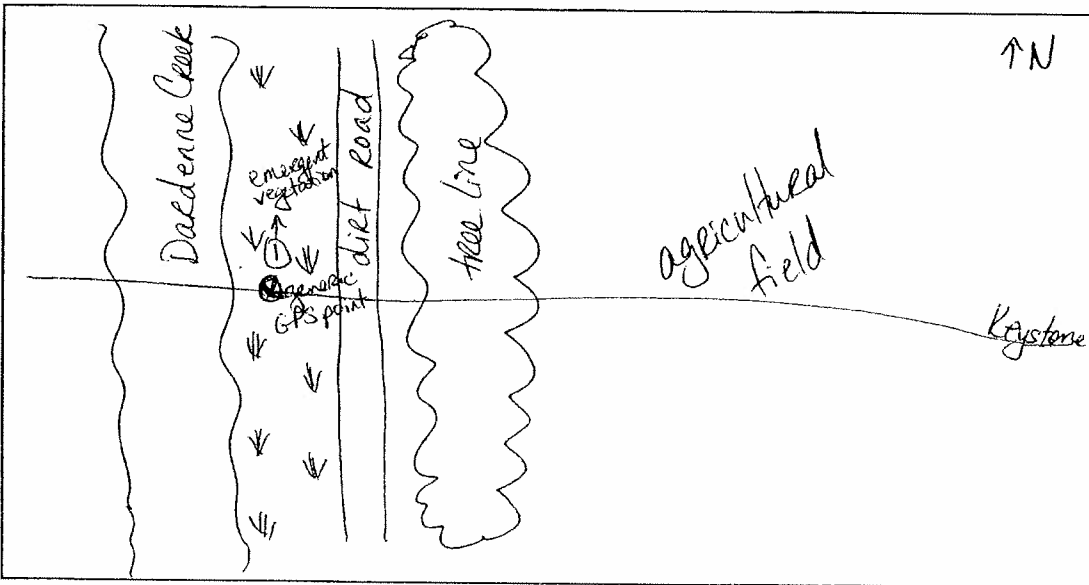
Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) / N If yes, estimated percent canopy closure: 10 % Dominant species (3): Quercus rubra, Ulmus rubra

Circle one: Area is likely to support or not likely to support protected snake species Explain:

no crayfish burrows, lots of trash & debris

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13MOSC011 MP: 1002.3-1002.6

Surveyor(s): Becky Berentigan, John Alexander Date of Survey: 11-14-06

Location of Survey (Lat/Lon or UTM): N 4338384.706 E 1243849.916

State: Missouri or Illinois County: St Charles

General description of site: wetland area of corn field Photo Number(s): 001W

Is standing water present? Y / N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1
Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): n/a

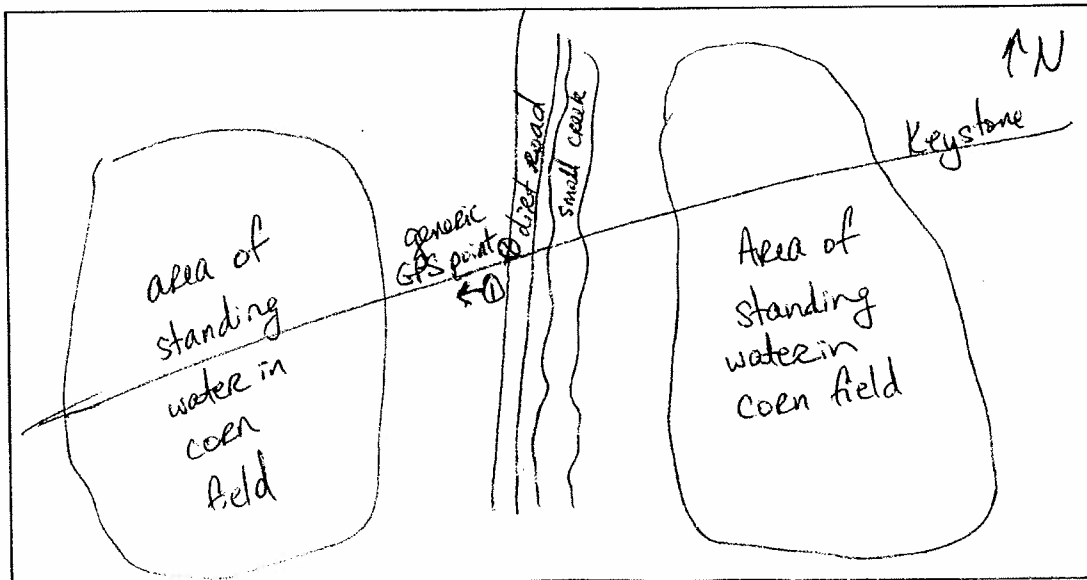
Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: n/a %
Dominant species (3): n/a

Circle one:
Area is likely to support or not likely to support protected snake species
Explain:

no crayfish burrows present,
wetland appears to be actively farmed for corn

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13 MOSC012 MP: 1003.30 - 1003.40

Surveyor(s): Becky Braentigam, John Alexander Date of Survey: 11-14-06

Location of Survey (Lat/Lon or UTM): N 4338929.732 E 1245192.982

State: Missouri or Illinois County: St. Charles

General description of site:
wetland/ditch in agricultural field

Photo Number(s): 001W, 002 crayfish burrows

Is standing water present? Y / (N)

Ground appears to be saturated: (frequently) temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): n/a

Type of water body: lake/pond stream river

Are crayfish burrows present? (Y) N If yes, estimated density (#/m²): 0.9

Describe other potential hibernacula present: n/a

Are there trees in the area? Y / (N) If yes, estimated percent canopy closure: n/a %

Dominant species (3): n/a

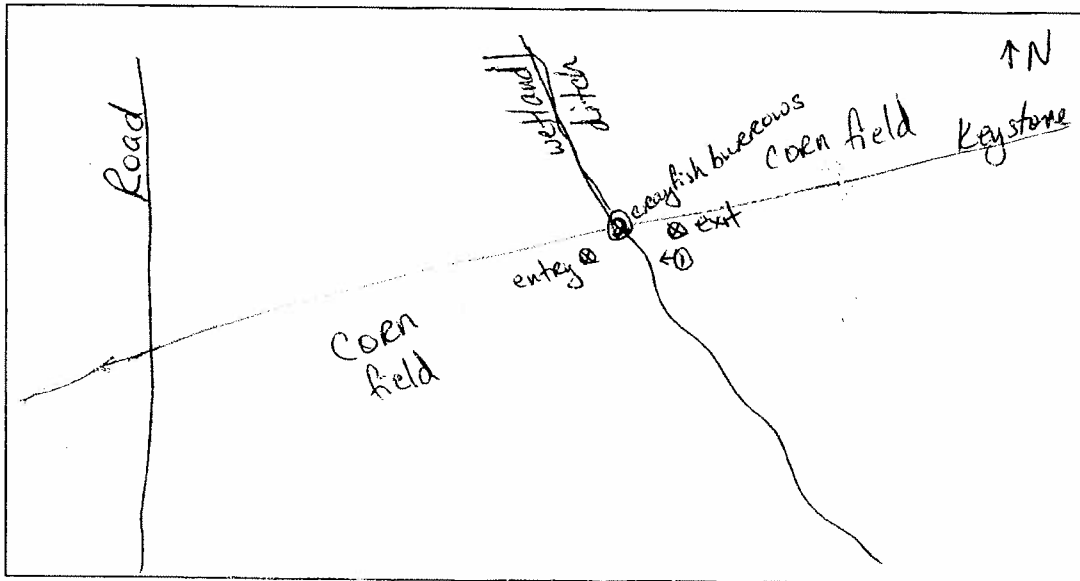
Circle one:

Area is (likely to support) or not likely to support protected snake species

Explain:

crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13 MOSC 013 MP: 1003.9-1004.00

Surveyor(s): Becky Braeutigam, John Alexander Date of Survey: 11-14-06

Location of Survey (Lat/Lon or UTM): N 4389300.673 E 1246160.468

State: Missouri or Illinois County: St. Charles

General description of site:

wetland surrounded by agricultural field

Photo Number(s): 001W

Is standing water present? Y (N)

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? (Y) N If yes, depth to saturated soil (cm): NA not saturated at 12 in depth

Estimated distance to nearest permanent body of water (m): n/a

Type of water body: lake/pond stream river

Are crayfish burrows present? Y (N) If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

Are there trees in the area? (Y) N If yes, estimated percent canopy closure: 45%

Dominant species (3): Acer saccharinum, Salix nigra

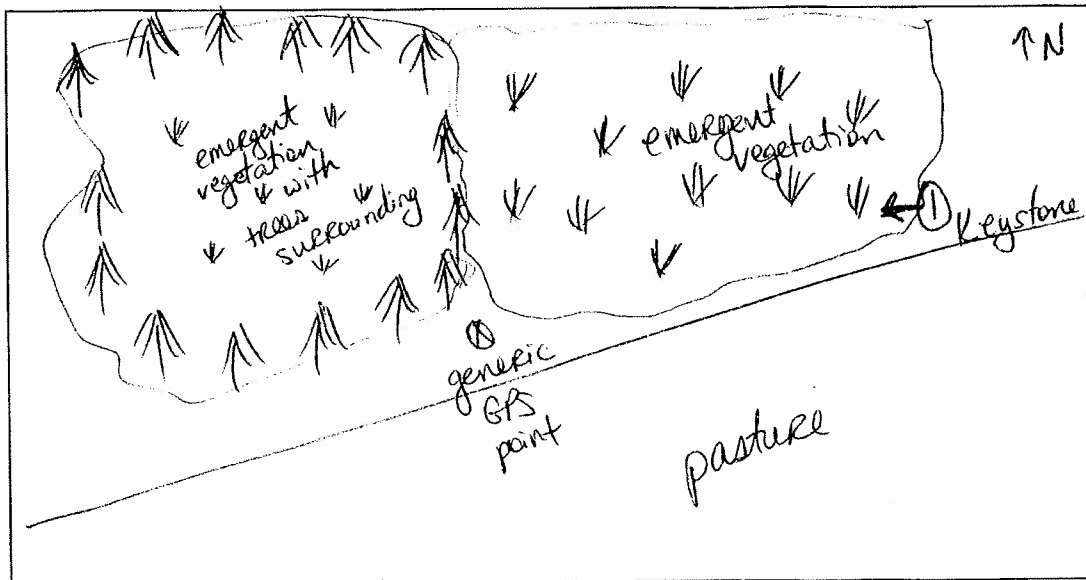
Circle one:

Area is likely to support or not likely to support protected snake species

Explain:

no crayfish burrows present

Sketch of Survey Area (indicate mileposts):





Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13MOSC014 MP: 1004.40-1004.50

Surveyor(s): Becky Braentigan, John Alexander Date of Survey: 11-14-06

Location of Survey (Lat/Lon or UTM): N 4335980.614 E 1246967.547

State: Missouri or Illinois County: St Charles

General description of site:
Forested wetland surrounded by agricultural field

Photo Number(s): 001W, 002 Test Pit

Is standing water present? Y N

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): n/a ^{not saturated at 12 in depth}

Estimated distance to nearest permanent body of water (m): n/a

Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

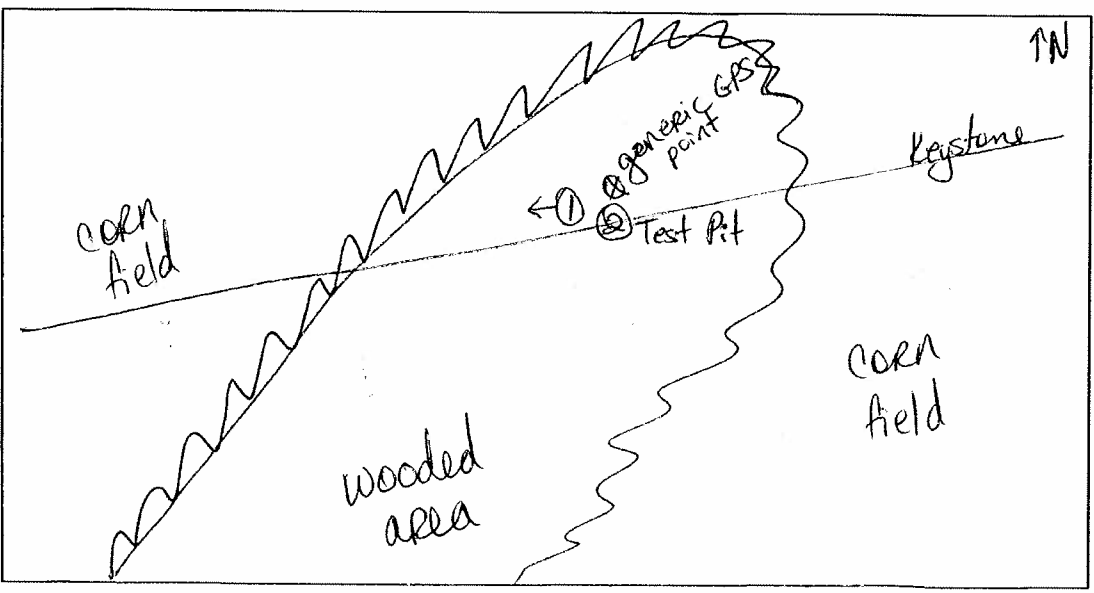
Are there trees in the area? Y N If yes, estimated percent canopy closure: 75 %

Dominant species (3): Acer saccharinum, Salix nigra, Quercus rubra

Circle one: Area is likely to support or not likely to support protected snake species

Explain:
no crayfish burrows present, dense canopy cover

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13MOSC015 MP: 1006.40-1006.50

Surveyor(s): Becky Beauregard, John Alexander Date of Survey: 11-14-06

Location of Survey (Lat/Lon or UTM): N 43040592.826 E 1249898.215

State: Missouri or Illinois County: St. Charles

General description of site: freshly tilled agricultural field Photo Number(s): 001E

Is standing water present? Y / (N)
Ground appears to be saturated: frequently temporarily/seasonally (rarely)

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 250
Type of water body: (lake/pond) stream river

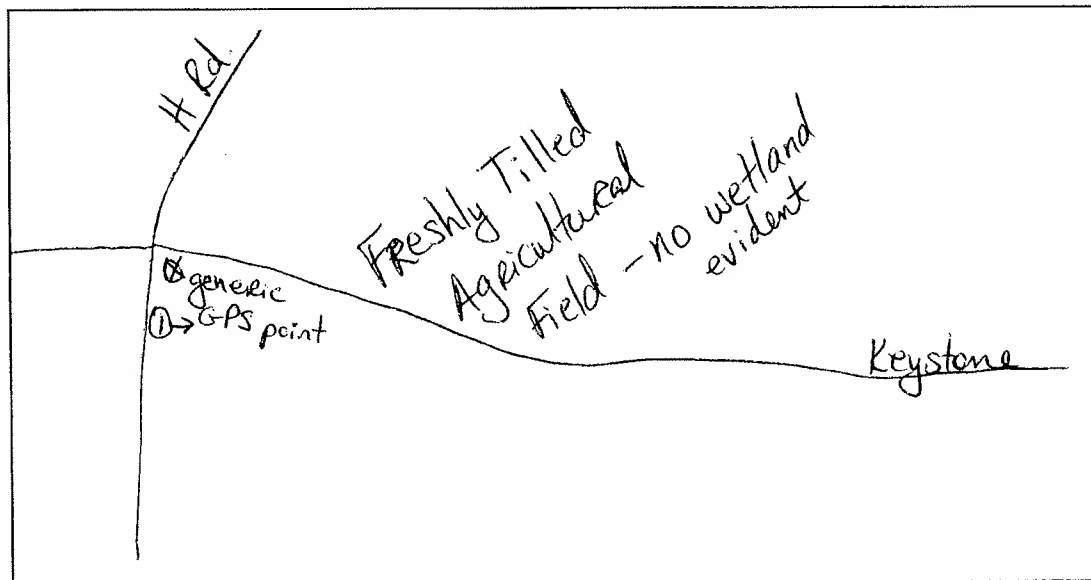
Are crayfish burrows present? Y / (N) If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

Are there trees in the area? Y / (N) If yes, estimated percent canopy closure: n/a %
Dominant species (3): n/a

Circle one:
Area is likely to support or (not likely to support) protected snake species
Explain: no crayfish burrows,

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATB413MOSC016 MP: 1006.80

Surveyor(s): Becky Braentigan, John Alexander Date of Survey: 11-14-06

Location of Survey (Lat/Lon or UTM): N 4340726.533 E 1250274.378

State: Missouri or Illinois County: St. Charles

General description of site: Photo Number(s): 001E

freshly tilled agricultural field

Is standing water present? Y N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 300m
Type of water body: take/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): n/a

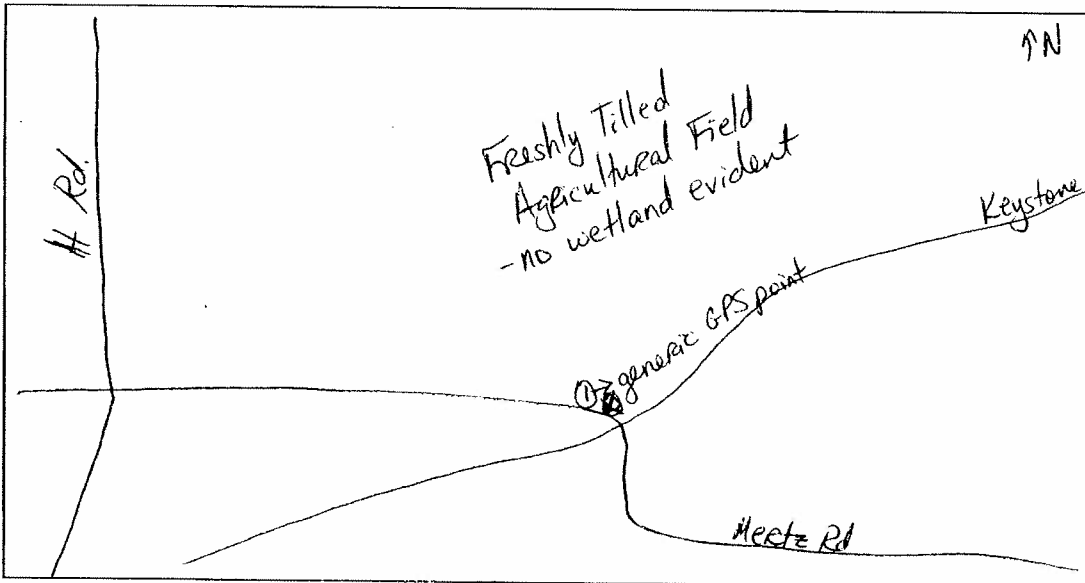
Describe other potential hibernacula present: n/a

Are there trees in the area? Y N If yes, estimated percent canopy closure: n/a %
Dominant species (3): n/a

Circle one:
Area is likely to support or not likely to support protected snake species

Explain:
site is freshly tilled agricultural field with no wetland evident, no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13NOSC017 MP: 1013.50 -1013.70

Surveyor(s): Becky Braeutigam, John Alexander Date of Survey: 11-14-06

Location of Survey (Lat/Lon or UTM): N 4339987.738 E 1260817.237

State: Missouri or Illinois County: St. Charles

General description of site: ditch through tilled agricultural field Photo Number(s): 001 N, 002 S

Is standing water present? Y / N Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): n/a Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): n/a

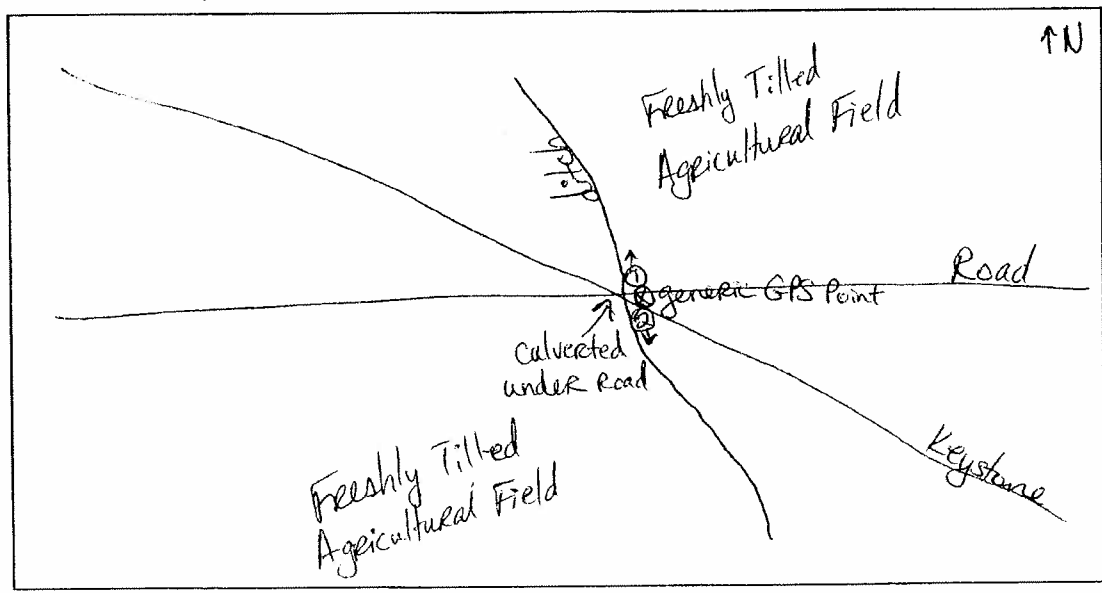
Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: n/a % Dominant species (3): n/a

Circle one: Area is likely to support or not likely to support protected snake species

Explain: no crayfish burrows present, site is a small ditch in a freshly tilled agricultural field

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13HOSC 018 MP: 1015.00 -1015.10

Surveyor(s): Betsy Braentjarn, John Alexander Date of Survey: 11-15-06

Location of Survey (Lat/Lon or UTM): N 4339002.206 E 1263010.423

State: Missouri or Illinois County: St Charles

General description of site:
emergent / scrub-shrub wetland

Photo Number(s): ~~001W BAB~~
001E -- incorrectly labeled
on white board as 001W

Is standing water present? Y / N

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1,600

Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: 45 %

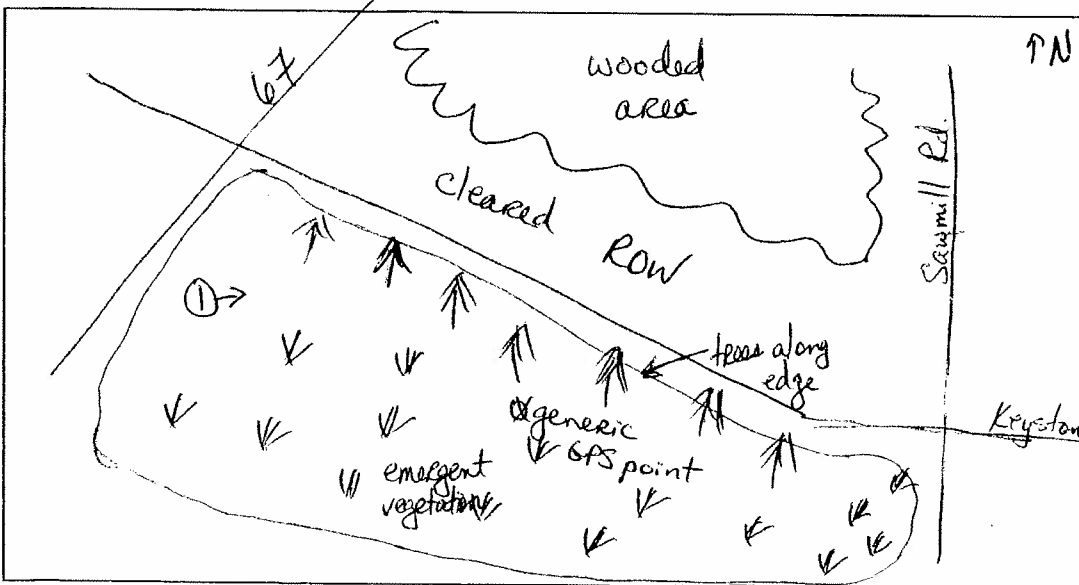
Dominant species (3): Salix nigra

Circle one:

Area is likely to support or not likely to support protected snake species

Explain:
no crayfish burrows

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13MOSC019 MP: 1015.20

Surveyor(s): Becky Beauregard, John Alexander Date of Survey: 11-15-06

Location of Survey (Lat/Lon or UTM): N438920.617 E 1263241.794

State: Missouri or Illinois County: St Charles

General description of site: emergent/scrub-shrub wetland Photo Number(s): 001E

Is standing water present? Y (N)
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1,600
Type of water body: lake/pond stream river

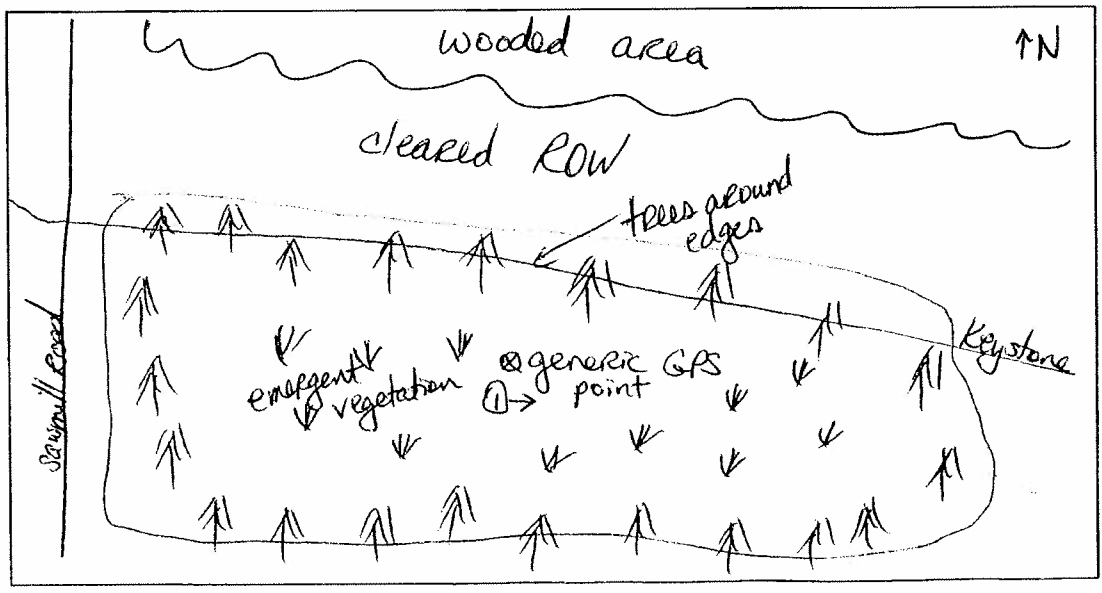
Are crayfish burrows present? Y (N) If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

Are there trees in the area? Y (N) If yes, estimated percent canopy closure: 15 %
Dominant species (3): Salix nigra

Circle one:
Area is likely to support or not likely to support protected snake species
Explain: no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13MOSCO20 MP: 1015.70-1015.80

Surveyor(s): Becky Brautigam, John Alexander Date of Survey: 11-15-06

Location of Survey (Lat/Lon or UTM): N 4338084.675 E 1264084.061

State: Missouri or Illinois County: St. Charles

General description of site: Photo Number(s): 001E

Wetland surrounded by prairie

Is standing water present? / N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): N/A

Estimated distance to nearest permanent body of water (m): 1200
Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): N/A

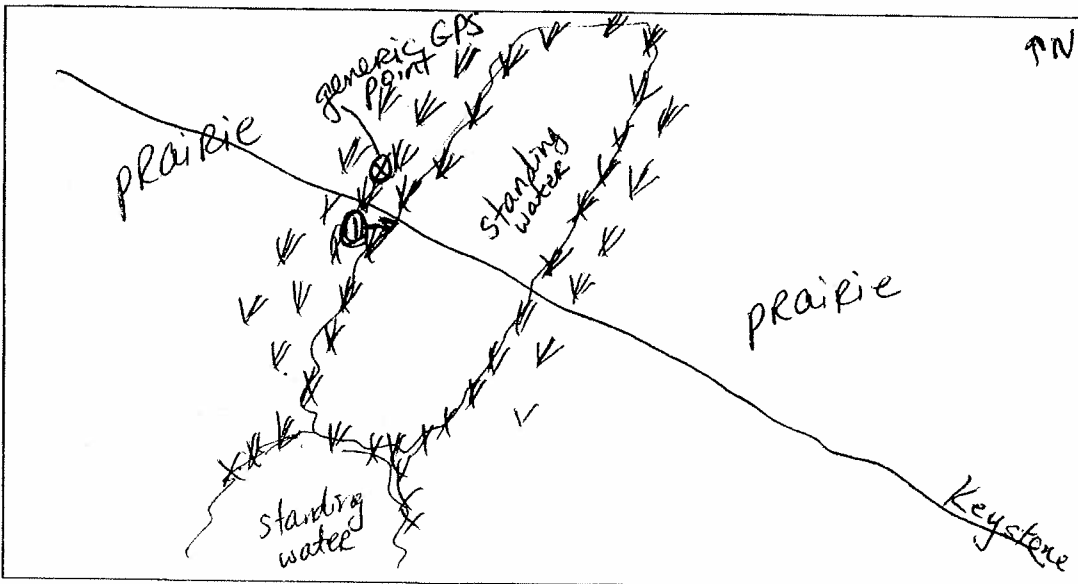
Describe other potential hibernacula present: N/A

Are there trees in the area? Y N If yes, estimated percent canopy closure: NA %
Dominant species (3): N/A

Circle one:
Area is likely to support or not likely to support protected snake species
Explain:

no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13MOSC022 MP: 1016.00

Surveyor(s): Booby Braentigan, John Alexander Date of Survey: 11-15-06

Location of Survey (Lat/Lon or UTM): N 4338450.150 E 1264525.413

State: Missouri or Illinois County: St. Charles

General description of site: emergent wetland in prairie Photo Number(s): 001E

Is standing water present? Y / (N)
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 1,000
Type of water body: lake/pond stream river

Are crayfish burrows present? Y / (N) If yes, estimated density (#/m²): n/a

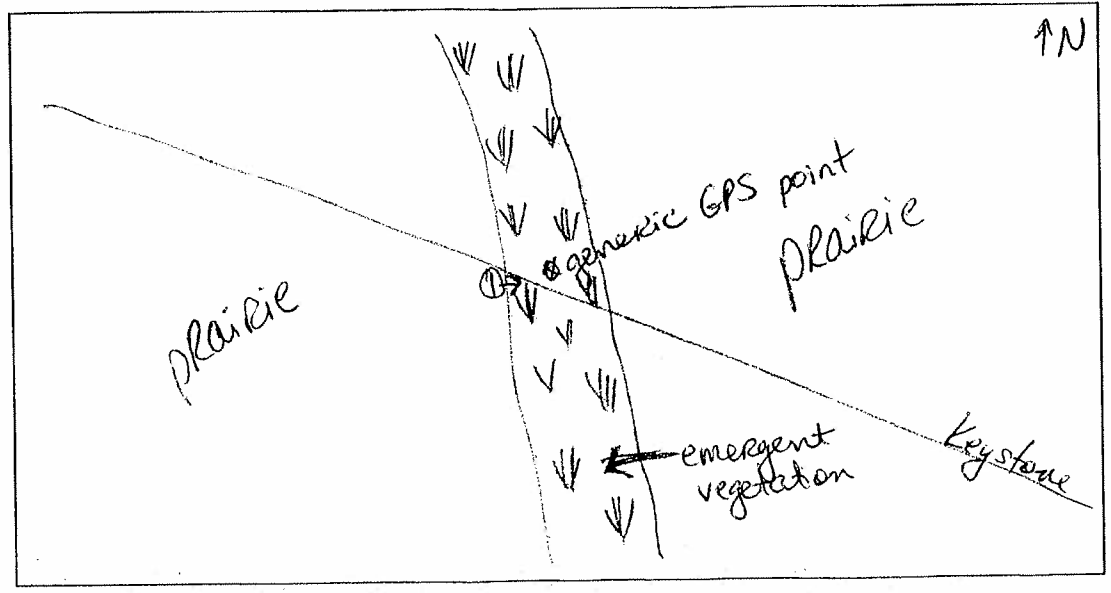
Describe other potential hibernacula present: n/a

Are there trees in the area? Y / (N) If yes, estimated percent canopy closure: n/a %
Dominant species (3): n/a

Circle one:
Area is likely to support or not likely to support protected snake species

Explain: no crayfish burrows present

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATBH13MOSC022 MP: 1016.70

Surveyor(s): Betsy Braentigam, John Alexander Date of Survey: 11-15-06

Location of Survey (Lat/Lon or UTM): N 4338094.018 E 1265558.152

State: Missouri or Illinois County: St. Charles

General description of site: Photo Number(s): 001W

PFO surrounded by agricultural field

Is standing water present? Y / N

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y / N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 900

Type of water body: lake/pond stream river

Are crayfish burrows present? Y / N If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

Are there trees in the area? Y / N If yes, estimated percent canopy closure: 65 %

Dominant species (3): Platanus occidentalis

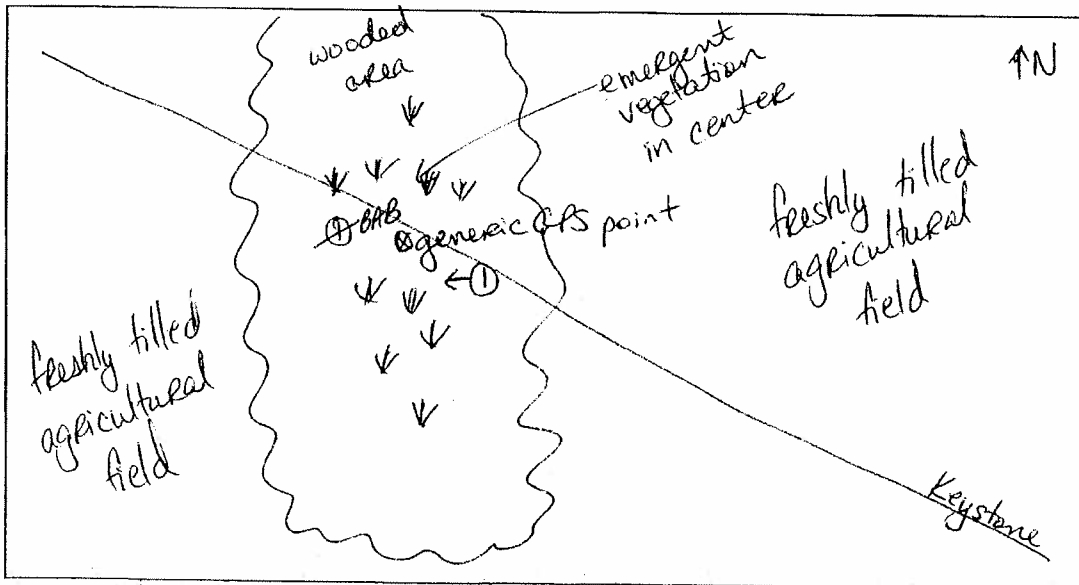
Circle one:

Area is likely to support or not likely to support protected snake species

Explain:

no crayfish burrows present, inundated soil

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NATB413NOSC023 MP: 1018.00

Surveyor(s): Becky Braentigam, John Alexander Date of Survey: 11-5-06

Location of Survey (Lat/Lon or UTM): N4337300.611 E1267482.372

State: Missouri or Illinois County: St. Charles

General description of site: Freshly tilled agricultural field Photo Number(s): 0015

Is standing water present? Y / (N)
Ground appears to be saturated: frequently temporarily/seasonally (rarely)

Was a test pit dug? Y / (N) If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 800
Type of water body: lake/pond stream (river)

Are crayfish burrows present? Y / (N) If yes, estimated density (#/m²): n/a

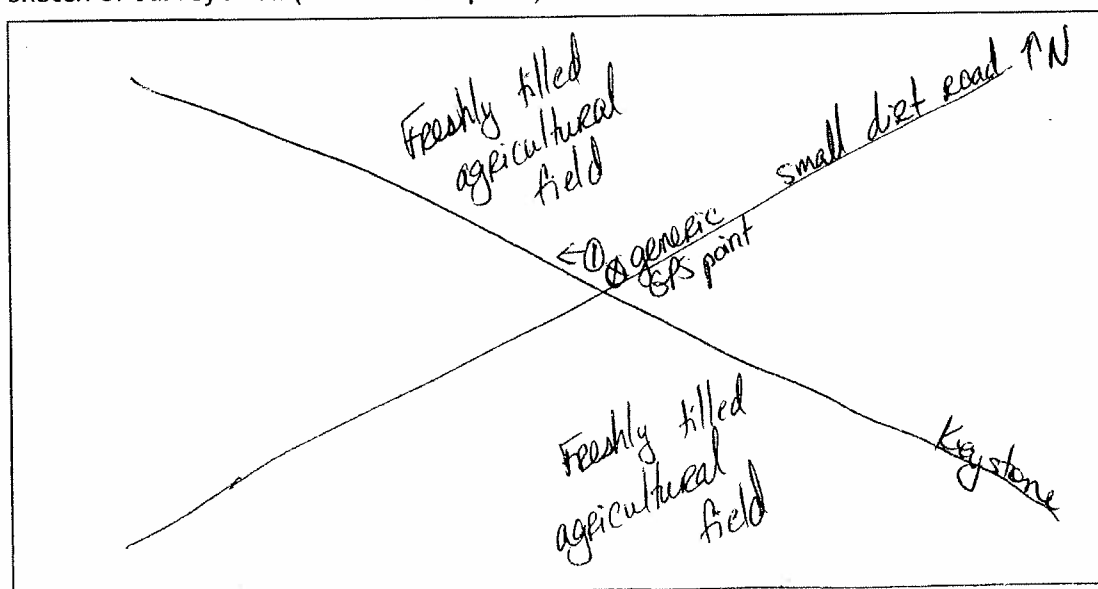
Describe other potential hibernacula present: n/a

Are there trees in the area? Y / (N) If yes, estimated percent canopy closure: n/a %
Dominant species (3): n/a

Circle one:
Area is likely to support or (not likely to support) protected snake species

Explain: no crayfish burrows present, site is a freshly tilled agricultural field

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Feature/Wetland ID: NAT 8413MOSC024 MP: 1018.30-1018.40

Surveyor(s): Bobby Brautigam, John Alexander Date of Survey: 11-5-06

Location of Survey (Lat/Lon or UTM): N 4337166.861 E 1267848.278

State: Missouri or Illinois County: St. Charles

General description of site:

Freshly tilled agricultural field

Photo Number(s): 001 SW

Is standing water present? Y N

Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 800
Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): n/a

Describe other potential hibernacula present: n/a

Are there trees in the area? Y N If yes, estimated percent canopy closure: n/a %

Dominant species (3): n/a

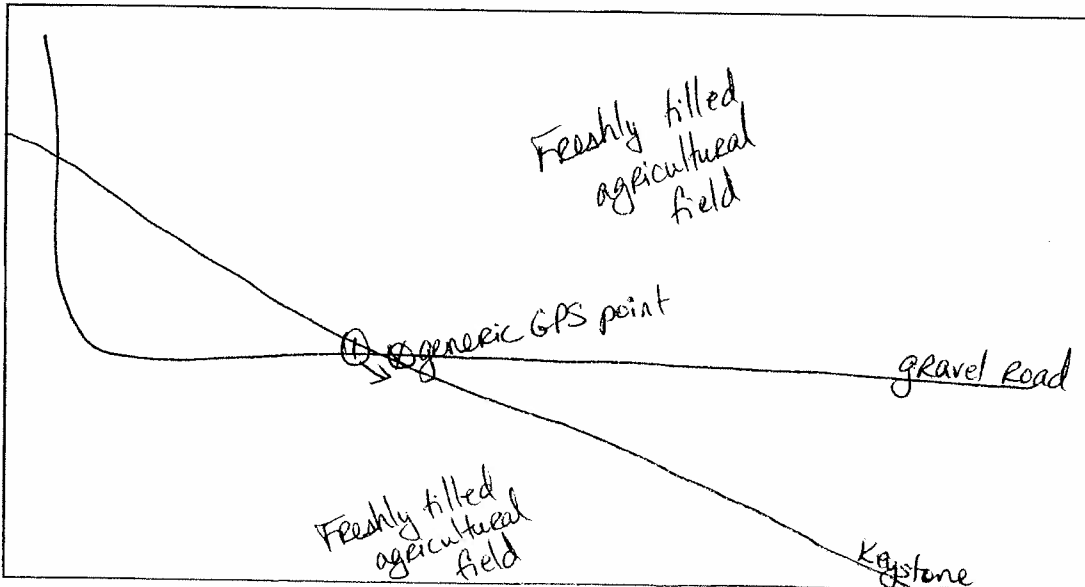
Circle one:

Area is likely to support or not likely to support protected snake species

Explain:

no crayfish burrows present, site is a freshly tilled agricultural field

Sketch of Survey Area (indicate mileposts):



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Keystone Pipeline Project Site Description Data Sheet

Wetland ID: NATBH13 MOSCOSS MP: 1020.90-1021.10

Surveyor(s): Betsy Braeutgam, John Alexander Date of Survey: 11-18-06

Location of Survey (Lat/Lon or UTM): N 4334939.989 E 1271586.082

State: Missouri or Illinois County: St Charles

General description of site:

PEM wetland near river confluence

Photo Number(s): 001W, 002E - incorrectly labeled on white board as 001E

Is standing water present? Y N
Ground appears to be saturated: frequently temporarily/seasonally rarely

Was a test pit dug? Y N If yes, depth to saturated soil (cm): n/a

Estimated distance to nearest permanent body of water (m): 100
Type of water body: lake/pond stream river

Are crayfish burrows present? Y N If yes, estimated density (#/m²): 2.0

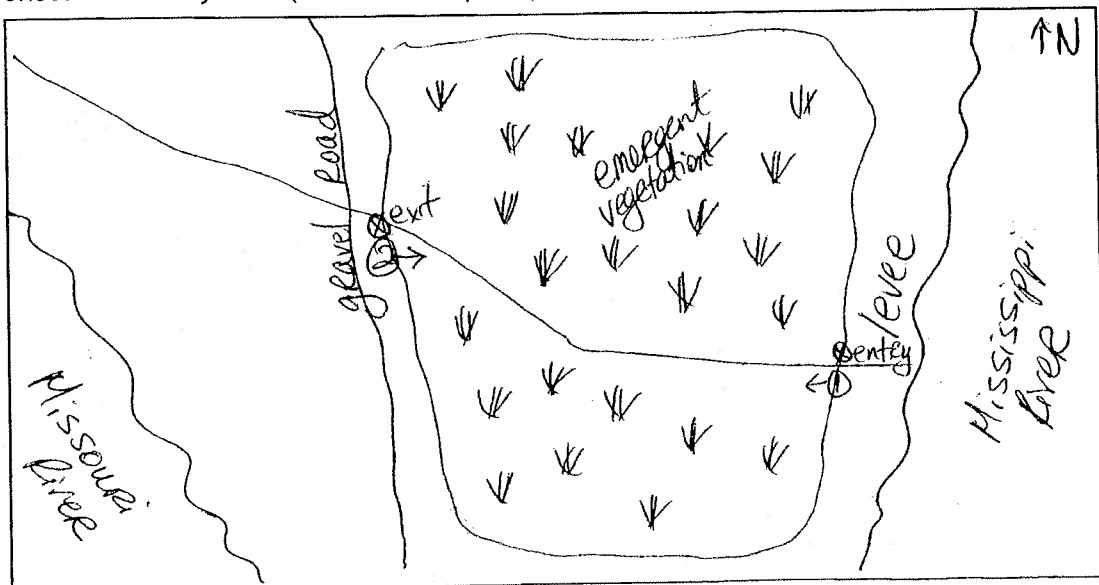
Describe other potential hibernacula present: small mammal burrows (field mouse was observed)

Are there trees in the area? Y N If yes, estimated percent canopy closure: n/a %
Dominant species (3): n/a

Circle one:
Area is likely to support or not likely to support protected snake species
Explain:

crayfish burrows abundant

Sketch of Survey Area (indicate mileposts):



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