

**Keystone Pipeline Project
Proposed Survey Schedule for Illinois
2006 - 2007**

Proposed 2007 Surveys					
Species & Status	Approximate Survey Dates	Specific Survey Areas (by County & MP)	Survey Description	Surveyor	Comments
Prairie spiderwort <i>Tradescantia bracteata</i> IL-T	Flowering period: 1-May to 1-June.	Madison: 1022.1-1022.7, 1023.8-1024.1, 1025.3-1025.6, 1026.5-1027.0, 1029.0-1033.1, 1034.2-1034.3, 1040.7	One survey will be conducted during the flowering period to determine presence within the construction ROW.	Qualified ENSR biologist and/or contractor	See attached survey protocol. 2008 pre-construction surveys would only be required in areas where this species was observed in 2007.
Royal catchfly <i>Silene regia</i> IL-E	Flowering period: late-May through Oct.	Madison: 1022.0-1022.3, 1022.7, 1023.8-1024.1, 1025.3-1025.6, 1026.5-1027.4, 1028.0-1033.1, 1034.2-1034.3, 1036.7-1037.1, 1037.8-1037.9, 1040.6-1041.1, 1042.5-1042.8, 1045.5-1047.0, 1049.0	One survey will be conducted during the flowering period to determine presence within the construction ROW.	Qualified ENSR biologist and/or contractor	See attached survey protocol. 2008 pre-construction surveys would only be required in areas where this species was observed in 2007.
Spring ladies' tresses <i>Spiranthes vernalis</i> IL-E	Flowering period: June - August	Madison: 1023.2-1024.2, 1024.9-1027.9, 1029.1-1033.1, 1034.2-1034.3, 1040.7-1041.2, 1042.8-1043.0, 1045.2-1048.0, 1049.0-1049.1	One survey will be conducted during the flowering period to determine presence within the construction ROW.	Qualified ENSR biologist and/or contractor	See attached survey protocol. (2008 pre-construction surveys would only be required in areas where this species was observed in 2007)

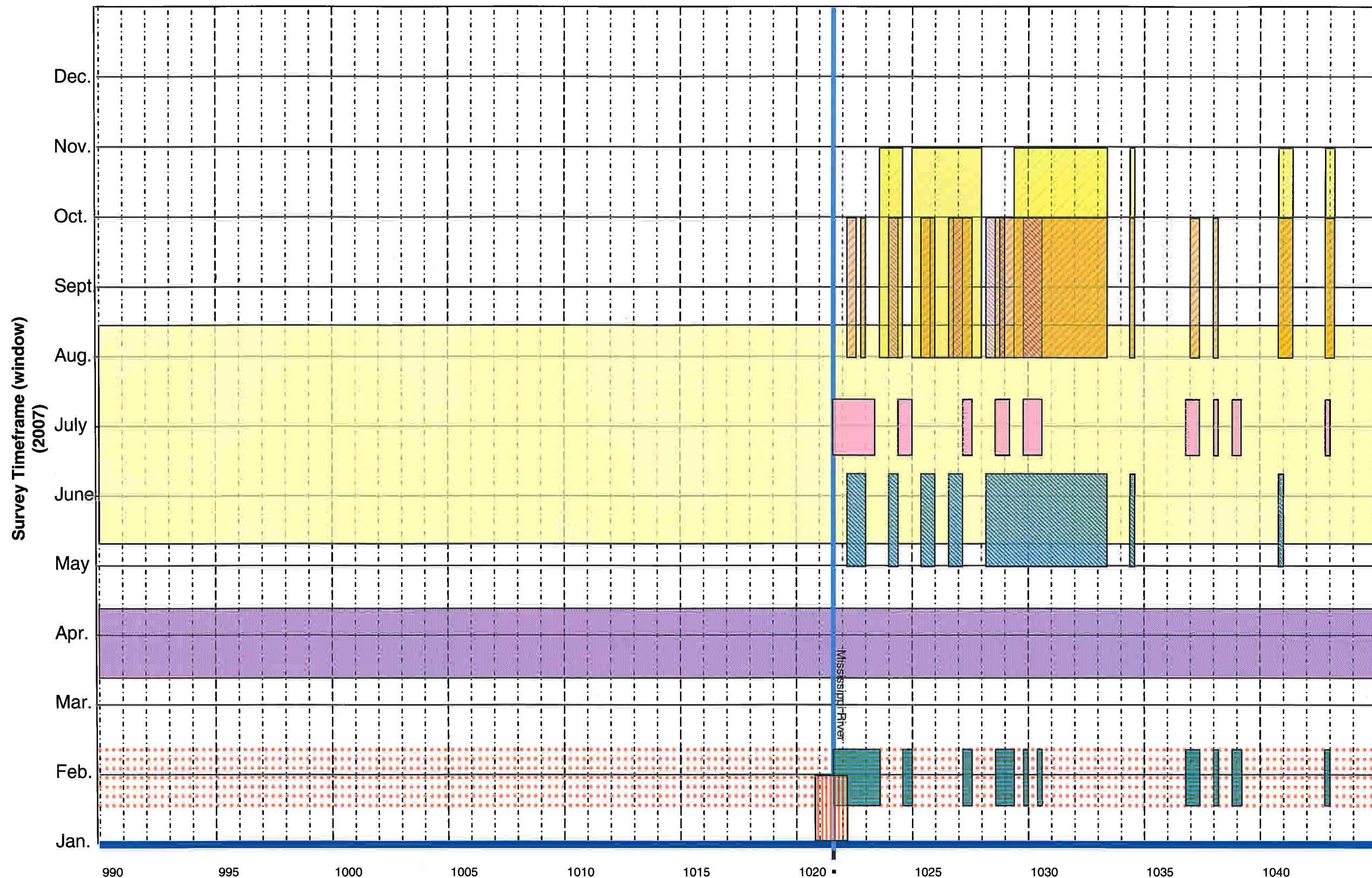
Keystone Pipeline Project Proposed Survey Schedule for Illinois 2006-2007

ID	Task Name	Qtr 1, 2007			Qtr 2, 2007			Qtr 3, 2007			Qtr 4, 2007		
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1	Indiana Bat Habitat Surveys	12/4	12/15										
2	Snake Habitat Surveys	12/4	12/15										
3	Indiana Bat Habitat Surveys - Complete Surveys			1/29		2/28							
4	Snake Habitat Surveys - Complete Surveys			1/29		2/28							
5	Bald Eagle Winter Roost & Nest Surveys			1/29		2/10							
6	Loggerhead Shrike Surveys				3/1								6/15
7	River Otter Surveys				3/1								9/30
8	Raptor Surveys				3/15								5/1
9	Massasauga and Kirtland's Snake Occurrence Surveys					4/2							6/30
10	Prairie Spiderwort Surveys						5/1						6/1
11	Indiana Bat Mist Net Surveys							5/15					8/15
12	Royal Catchfly Surveys								5/25				10/30
13	Spring Ladies' Tresses Surveys									6/1			8/31
14	Eastern Fringed Orchid Surveys										6/26		7/15
15	Decurrent False Aster Surveys											8/28	9/30

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Biological Survey March-Chart 2007

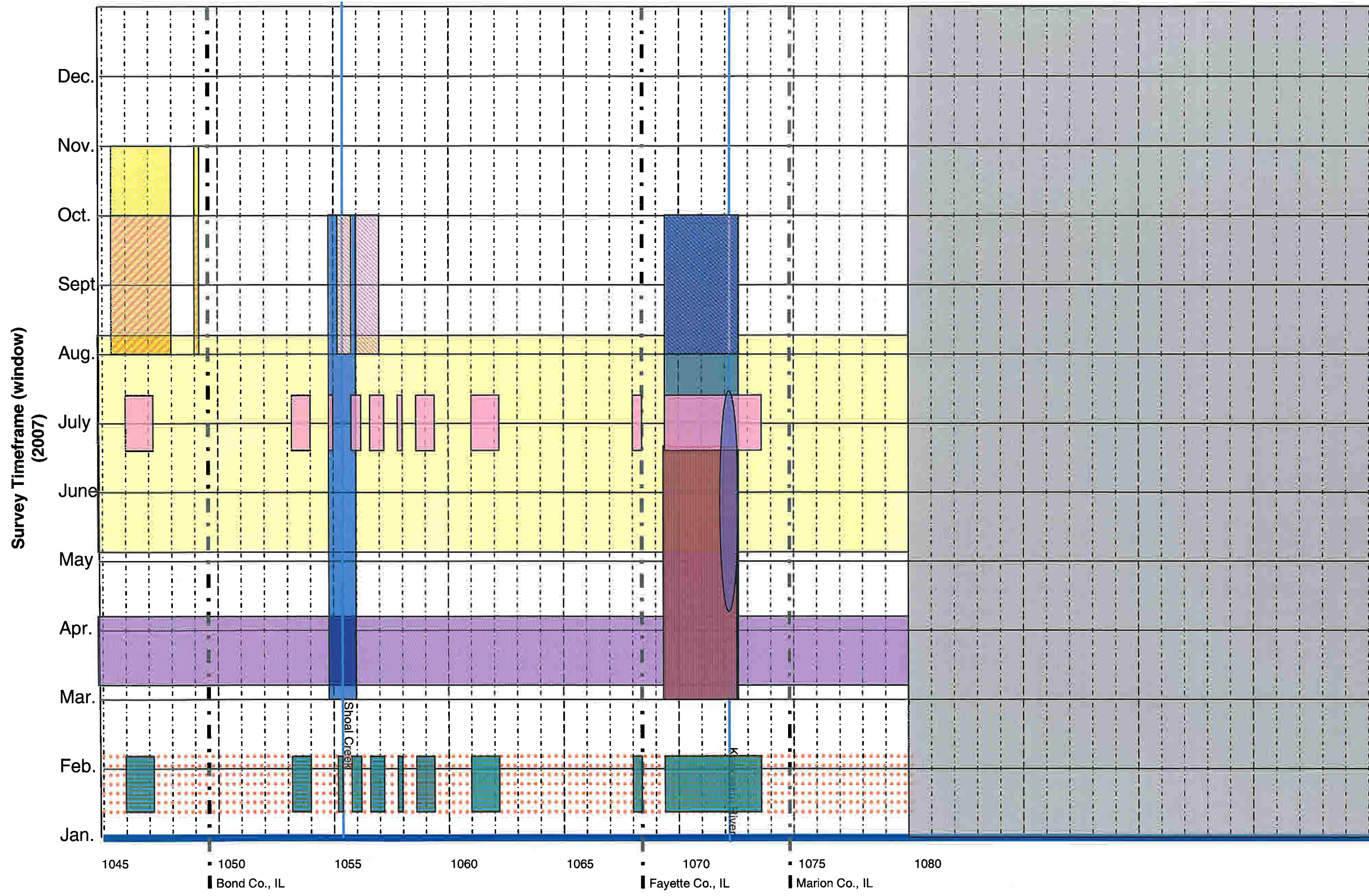


Keystone Mainline Mileposts (August 2006)

- Indiana Bat Mist Net Surveys; to be conducted at specific woodlots determined from 2006 habitat analysis
- Bald Eagle (Winter Roost and Nest Sites)
- Raptors
- Massasauga & Kirtland's Snake Habitat
- Running Buffalo Clover
- Decurrent False Aster
- Prairie Spiderwort
- Eastern Fringed Orchid
- Royal catchfly
- Spring Ladies tresses
- Indiana Bat Habitat Surveys; conducted at woodlots not surveyed during 2006 field work

Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

Biological Survey March-Chart 2007



Keystone Mainline Mileposts (August 2006)

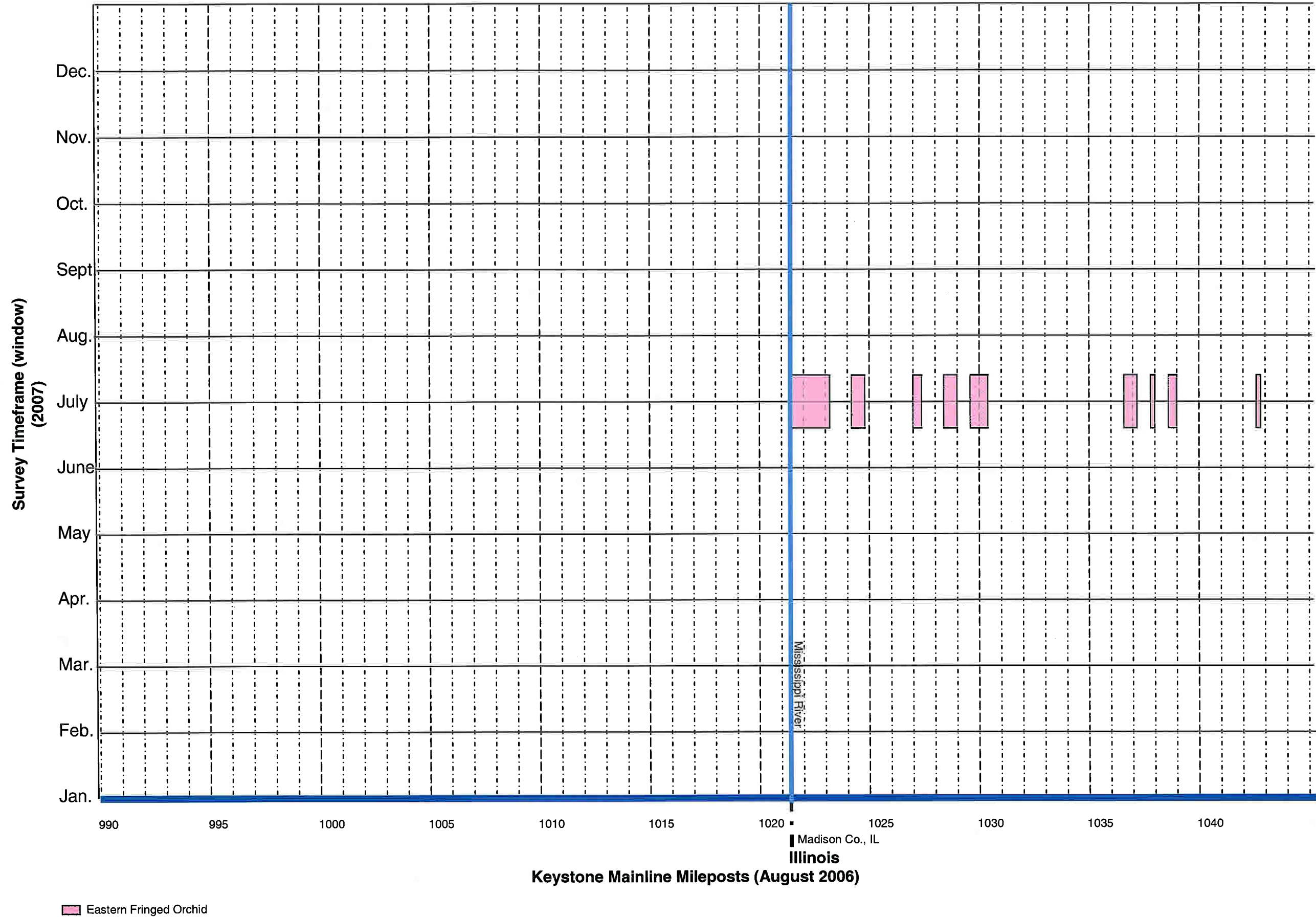
- Indiana Bat Mist Net Surveys; to be conducted at specific woodlots determined from 2006 habitat analysis
- Raptors
- Loggerhead shrike
- Indiana Bat Habitat Surveys; conducted at woodlots not surveyed during 2006 field work
- Massasauga & Kirtland's Snake Habitat Survey
- Eastern Fringed Orchid
- River Otter
- Decurrent False Aster
- Western Sand Darter

Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

**Addendum:
Species Specific Survey
March-Charts, Illinois**

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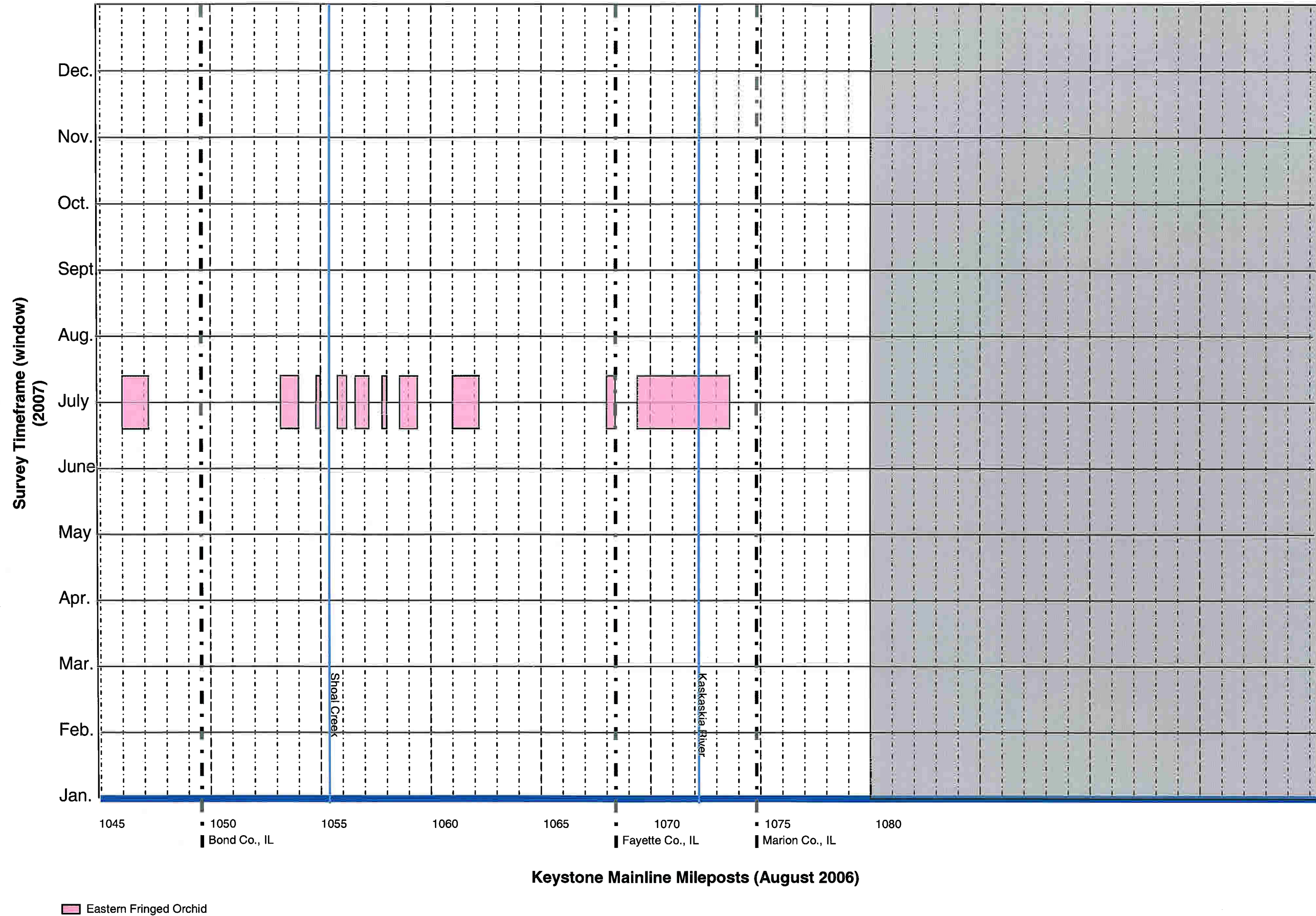
Eastern Fringed Orchid Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

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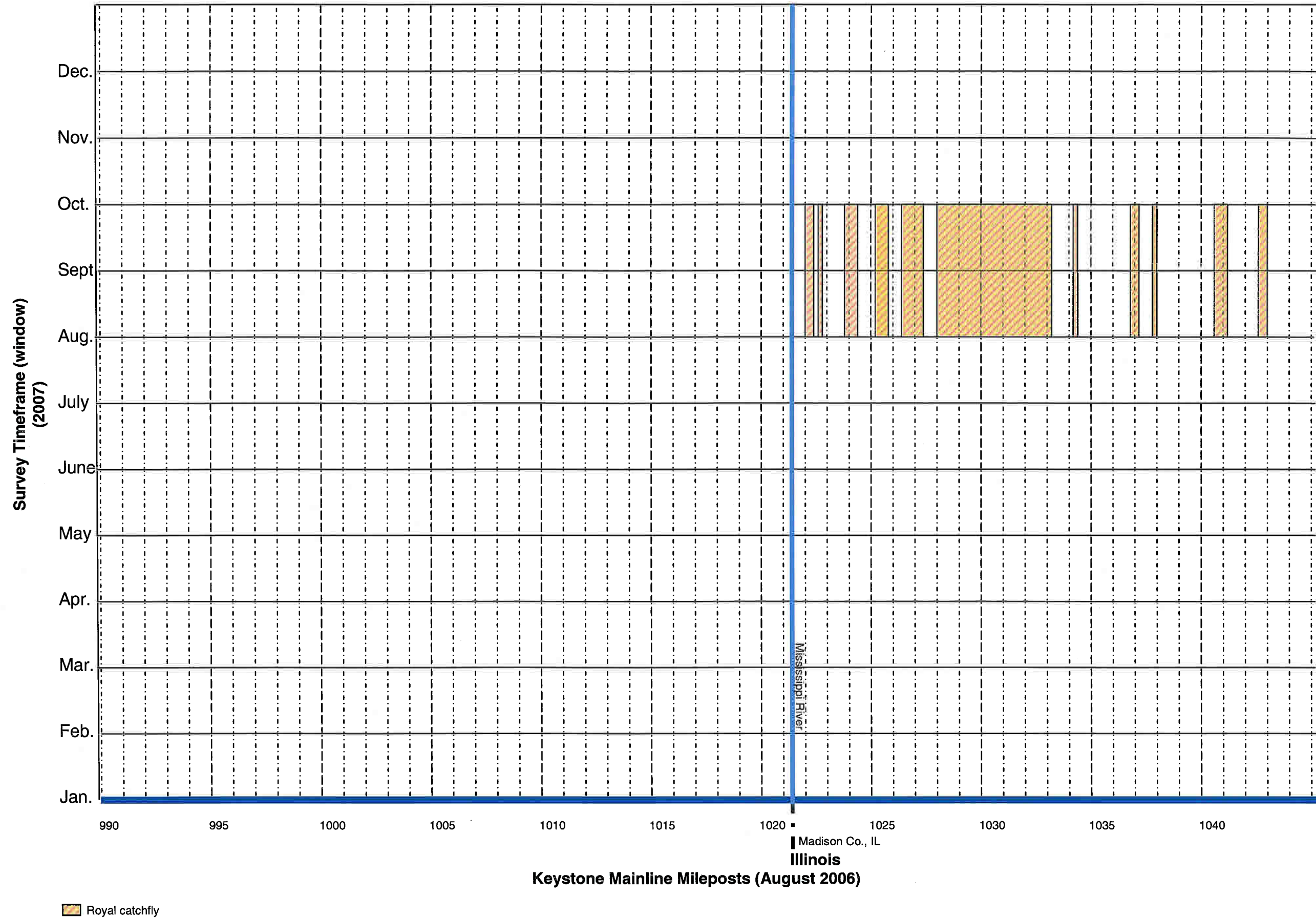
Eastern Fringed Orchid Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

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Royal Catchfly Biological Survey March-Chart 2007

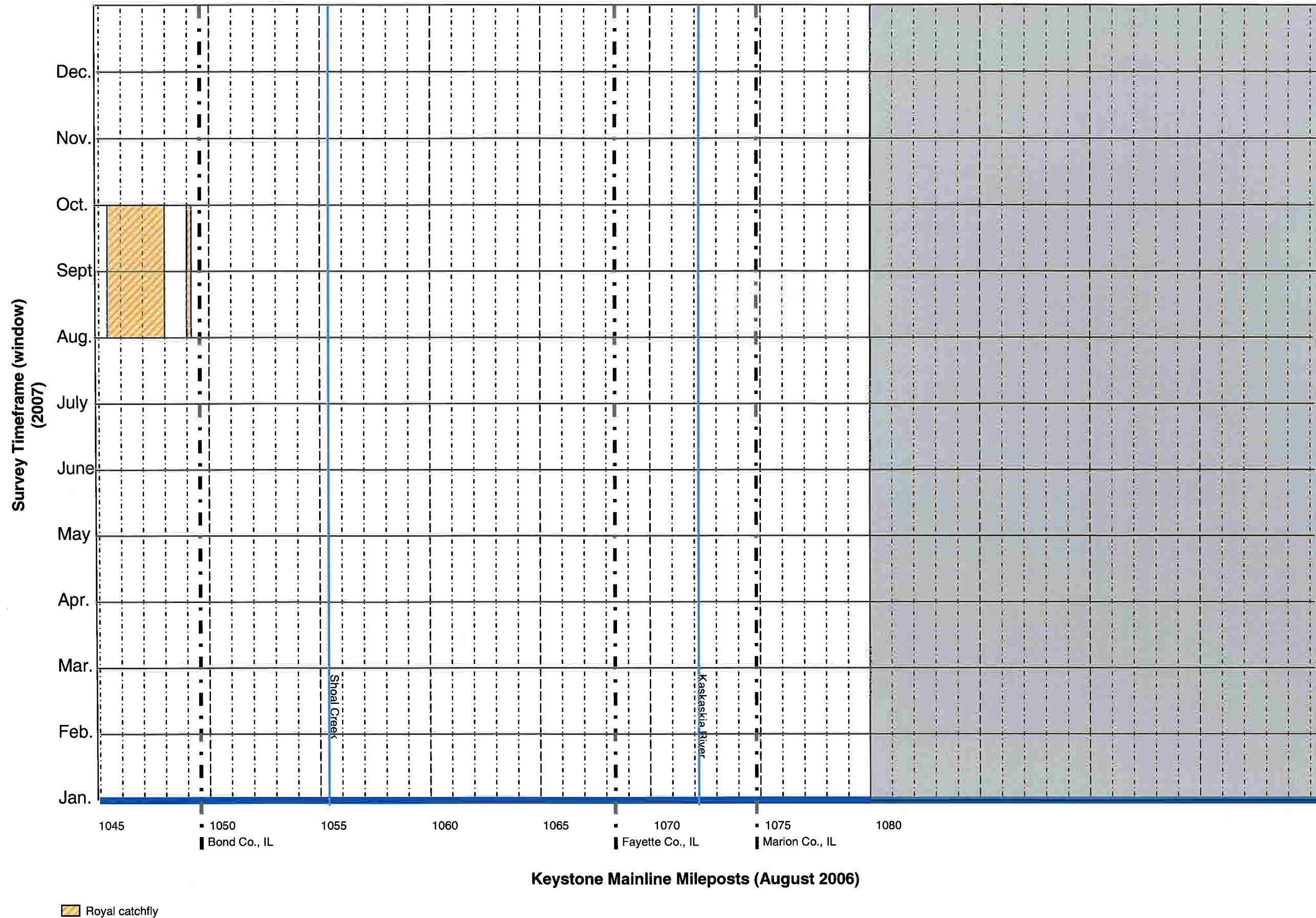


Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

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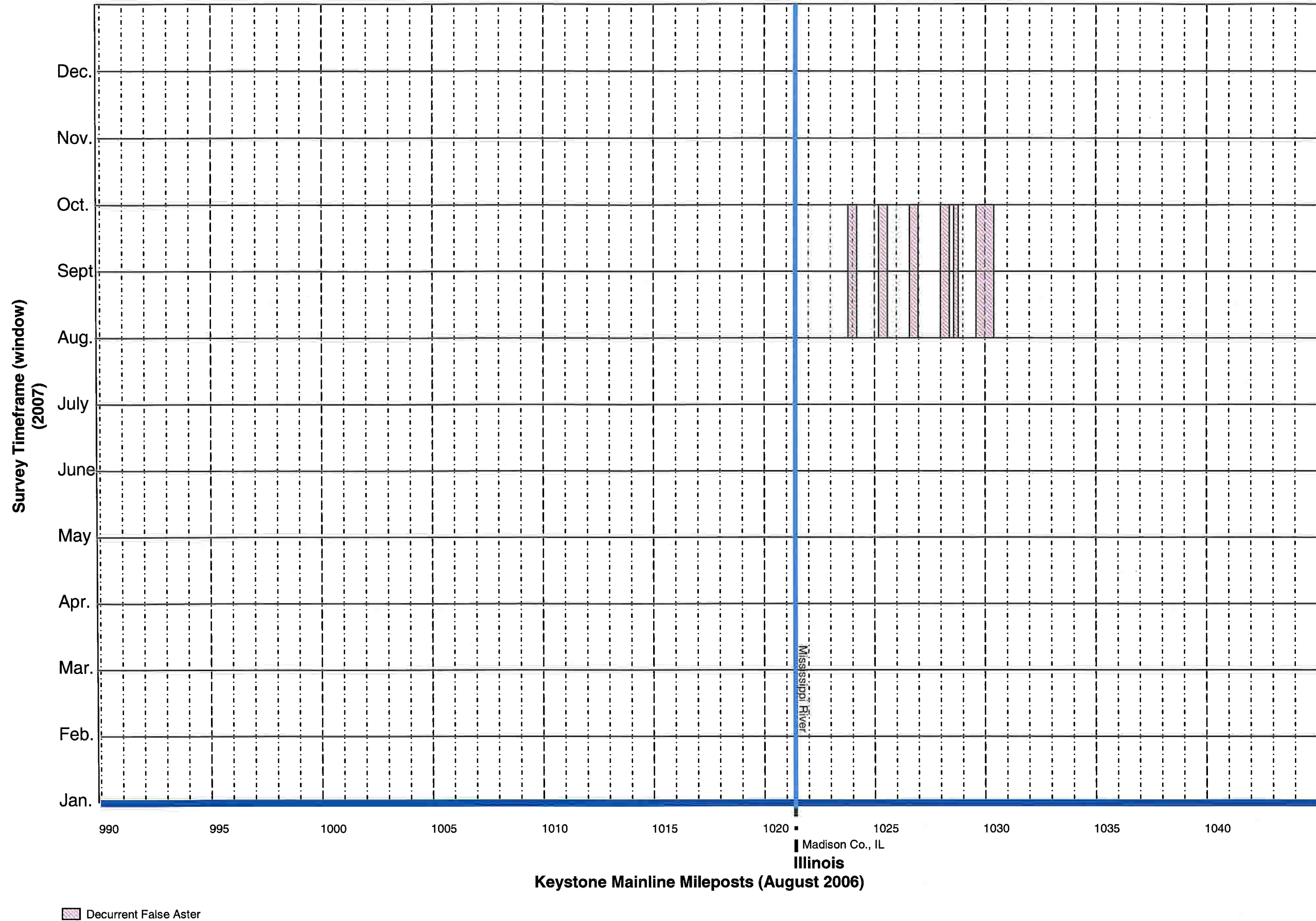
Royal Catchfly Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

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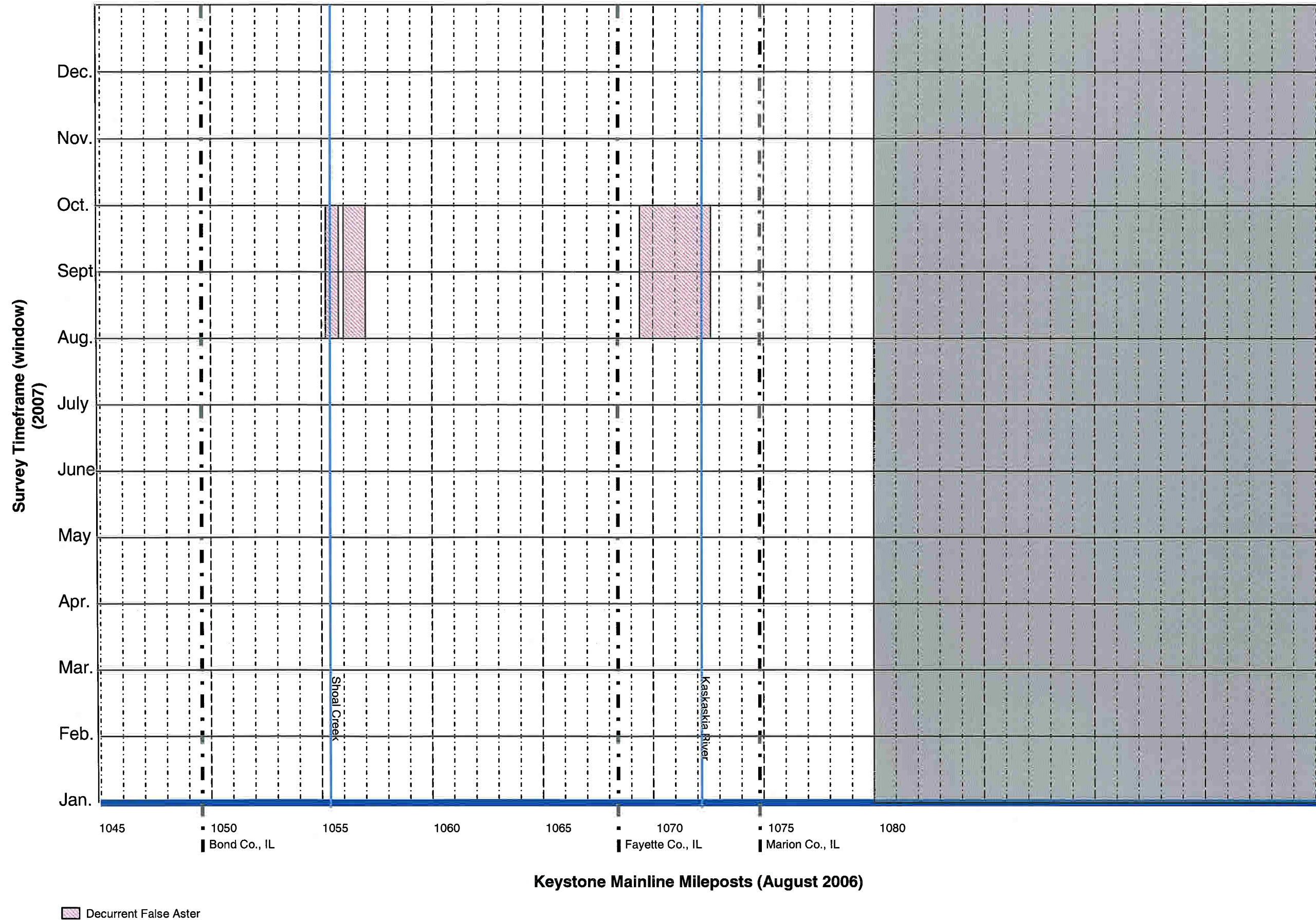
Decurrent False Aster Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within. not the actual time it will take to complete surveys.

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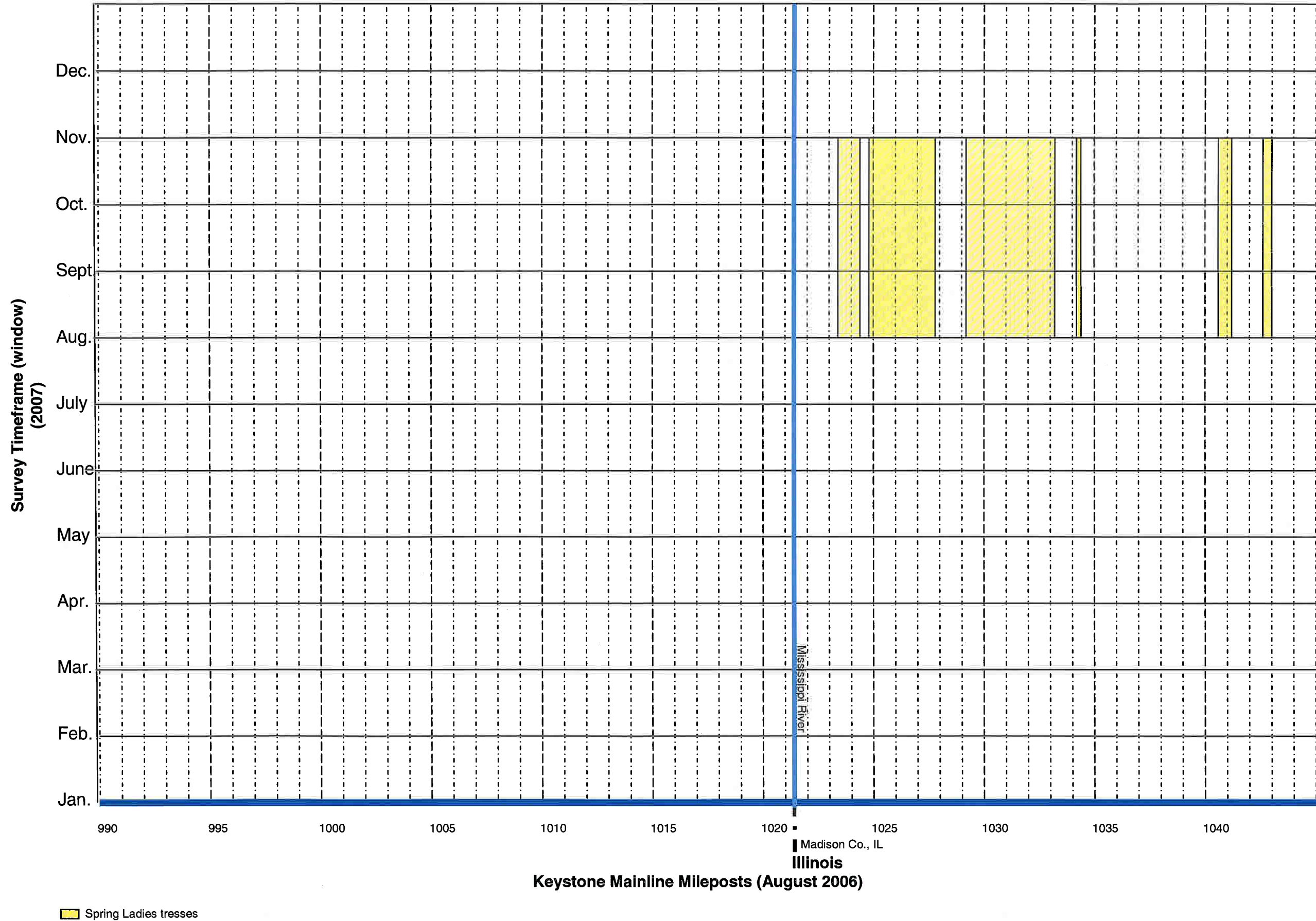
Decurrent False Aster Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

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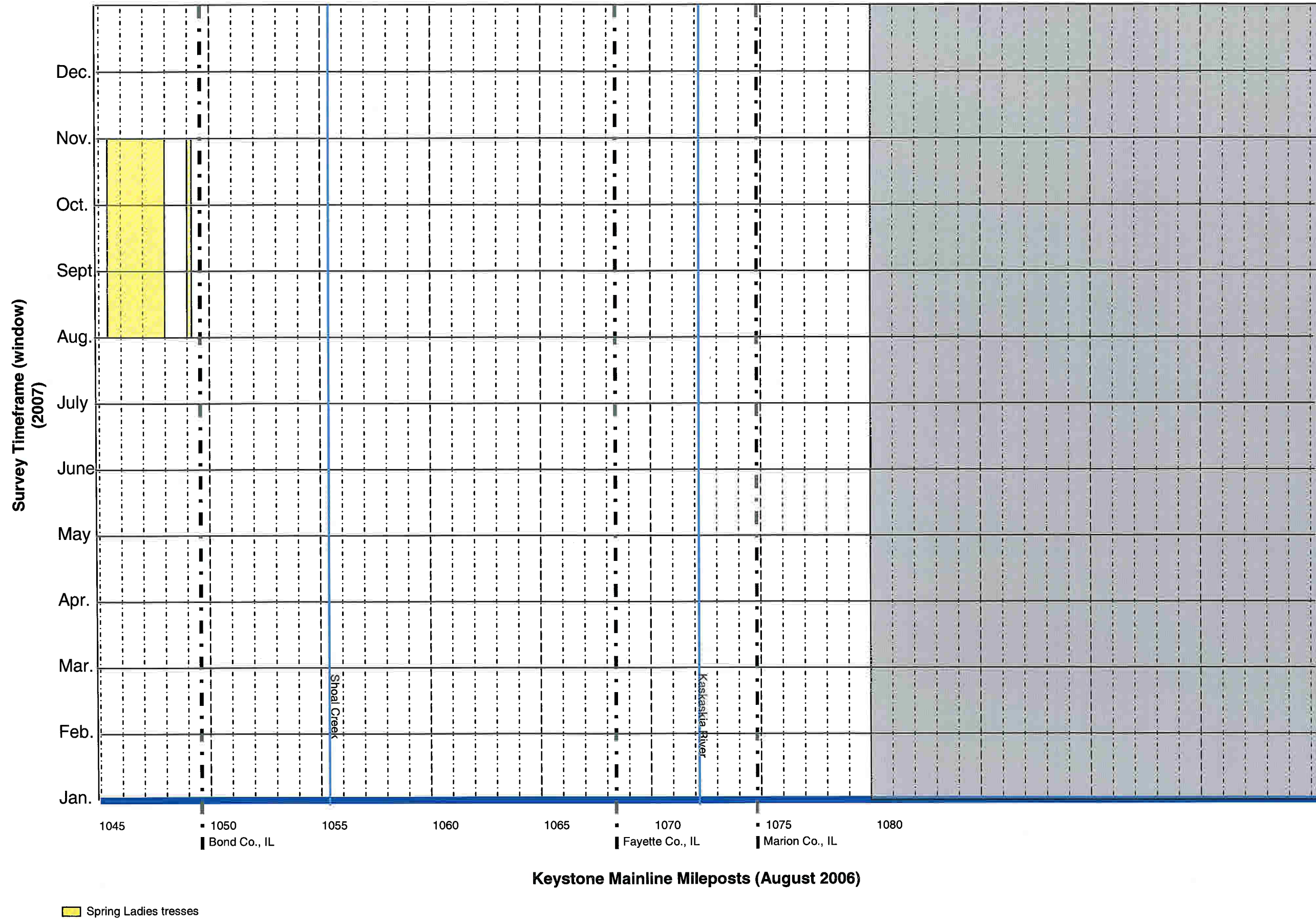
Spring Ladies' Tresses Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

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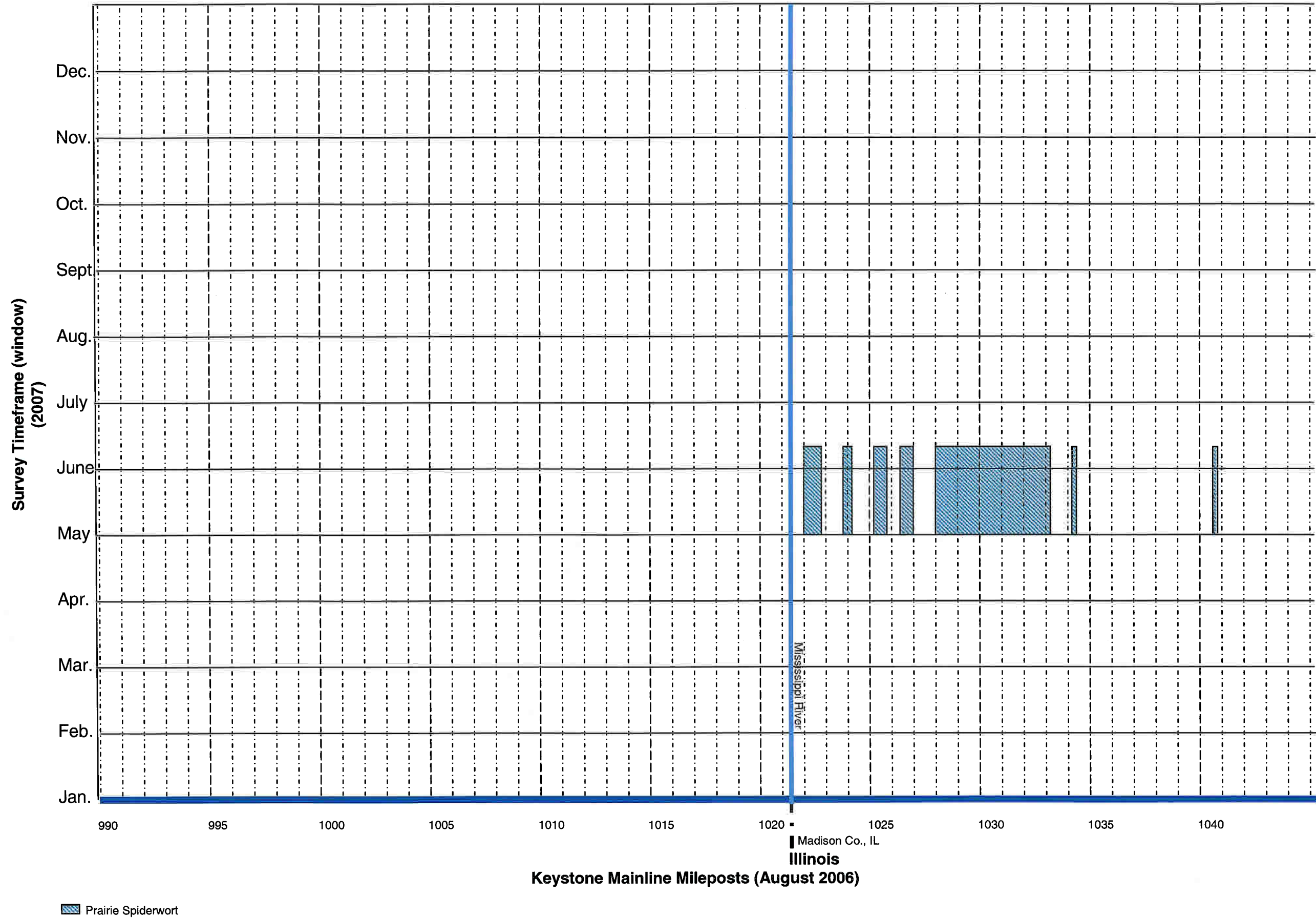
Spring Ladies' Tresses Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

Keystone Pipeline Project

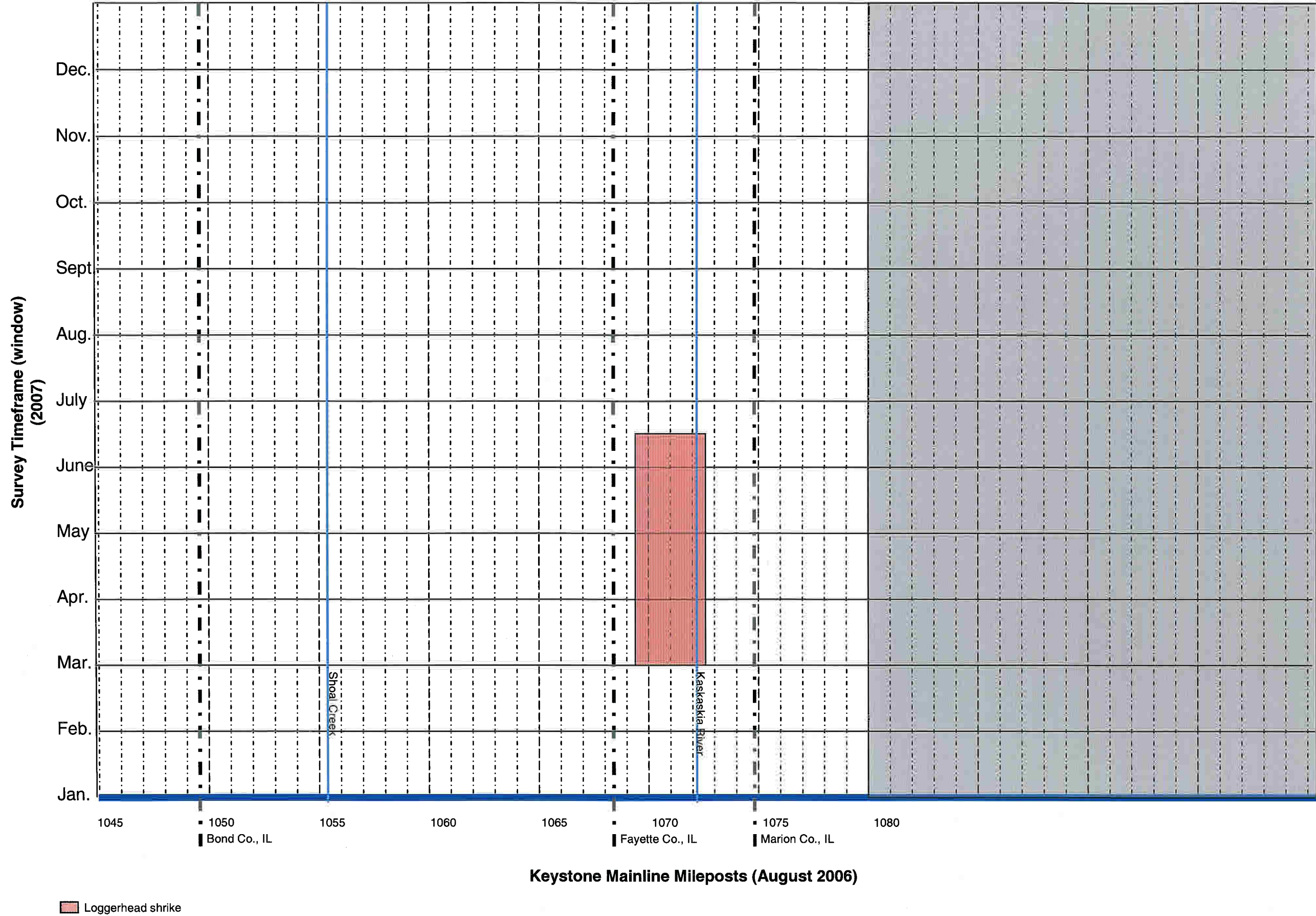
Prairie Spiderwort Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

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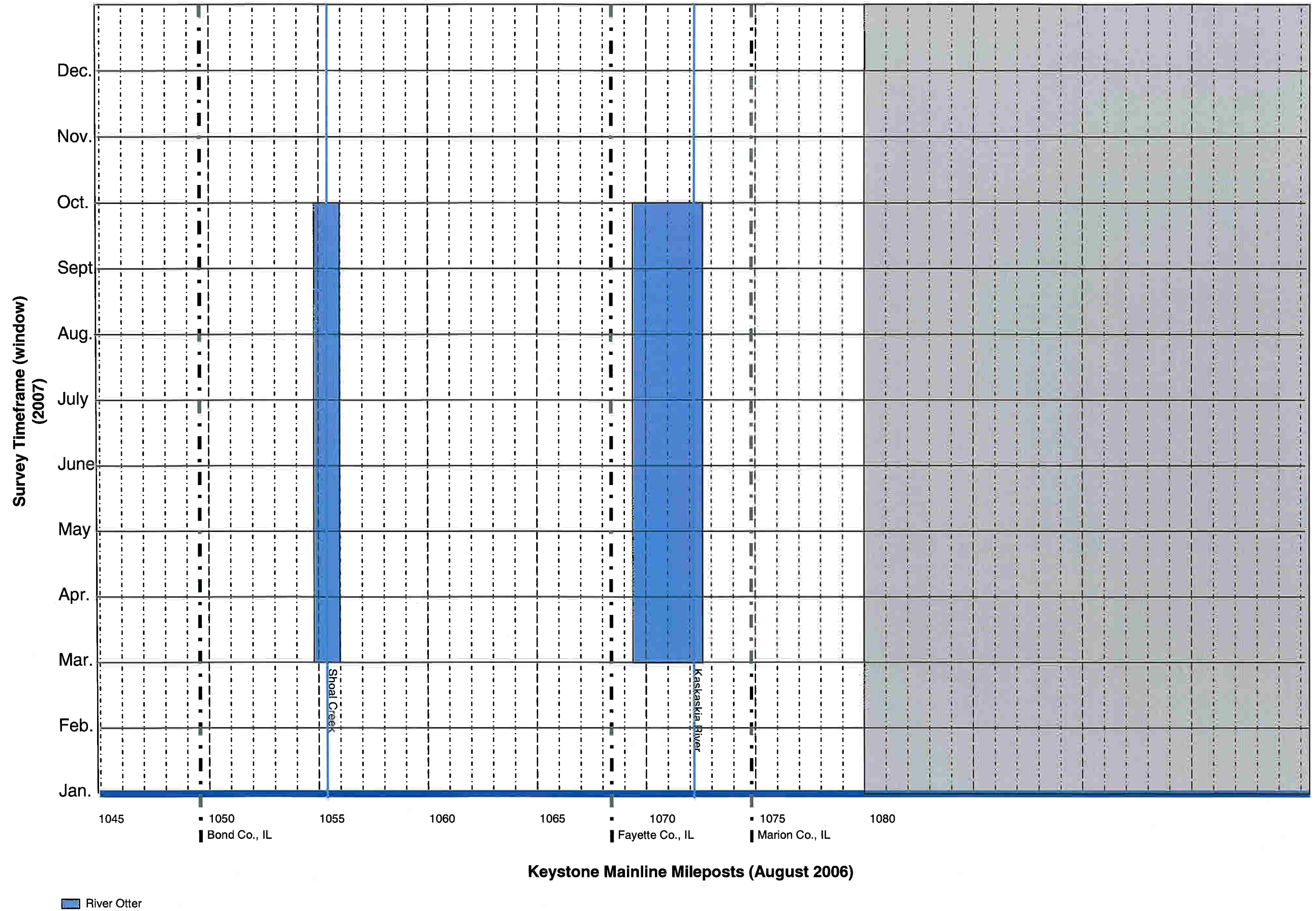
Loggerhead Shrike Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

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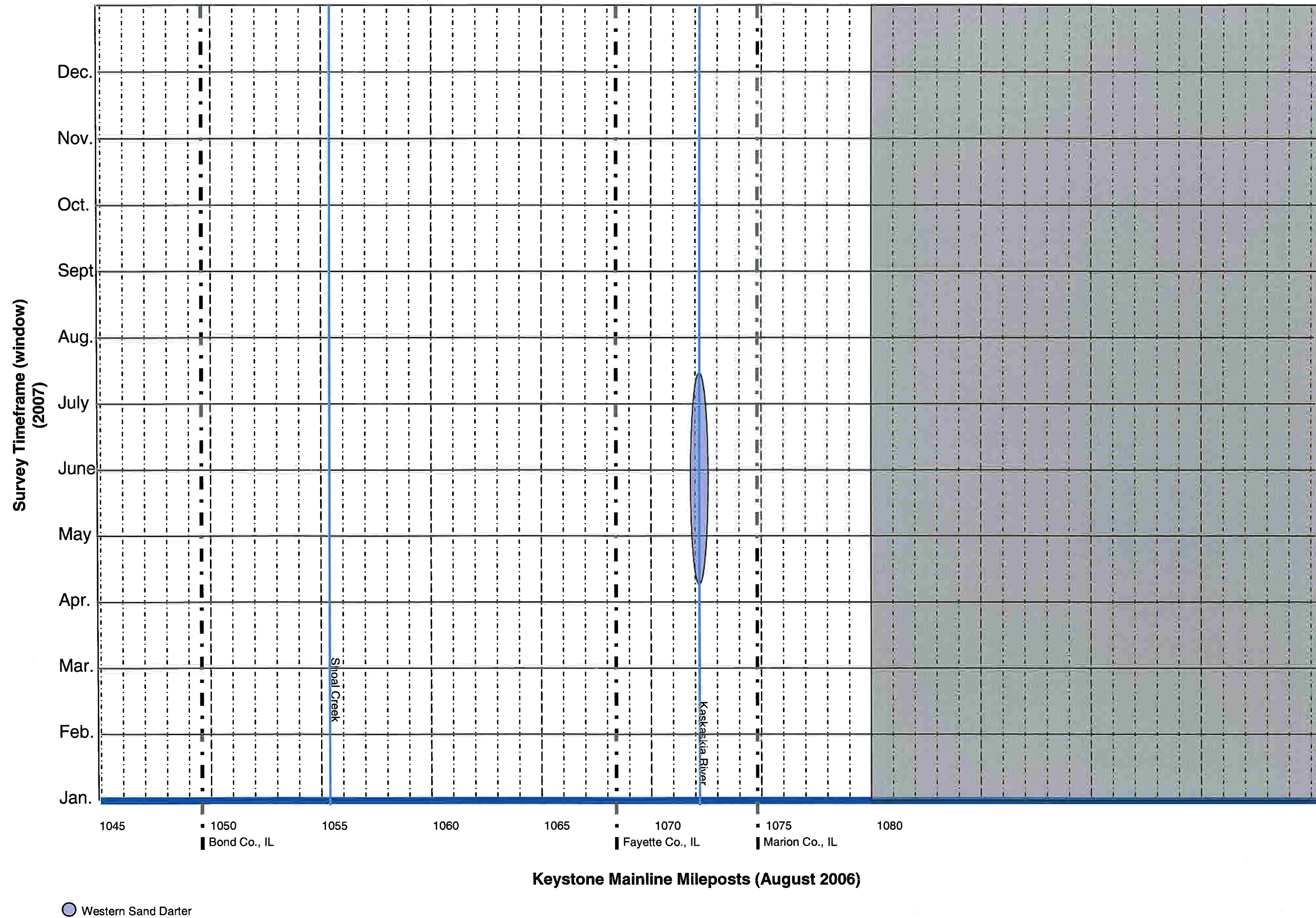
River Otter Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

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Western Sand Darter Biological Survey March-Chart 2007



Note: Survey timeframe represents window biological surveys should be completed within, not the actual time it will take to complete surveys.

**Keystone Pipeline Project
Survey Protocols for Illinois Special Status Species**

Species & Status	Survey Protocol
Indiana Bat <i>Myotis sodalis</i> FE; IL-E	<p>Survey Frequency: Habitat surveys were initiated in 2006 to characterize habitat quality for potential roosting habitat. Habitat evaluations are scheduled to be completed in spring 2007.</p> <p>Occurrence surveys (i.e., mist netting) would be conducted in 2007, in coordination with the USFWS.</p> <p>Procedures: See attached Indiana Bat Study Plan and USFWS Mist Netting Guidelines. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR and the appropriate U.S. Fish and Wildlife Service (USFWS) field office.</p>
River Otter <i>Lontra Canadensis</i> IL-E	<p>Survey Frequency: Surveys will be conducted in 2007 at the crossing of Shoal Creek and the Kaskaskia River in the Carlyle Lake WMA during the river otter denning season (March through September). Surveys may also be conducted prior to construction in 2008 if pipeline construction occurs during the denning season.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1. Surveys will be conducted by a qualified biologist at the Shoal Creek and Kaskaskia River crossings 2. Surveys will be conducted for den sites within 0.25-mile upstream and downstream of the river crossing on both sides of the river bank. 3. Observations of river otters or dens will be recorded using GPS. Date, time, number otters/dens, land use and/or habitat type will be recorded for each sighting. 4. Results of the survey will be sent to the IDNR to determine if actions are needed to avoid impacts to the river otter.
Bald Eagle <i>Haliaeetus leucocephalus</i> FT; IL-T	<p>Survey Frequency: Aerial bald eagle surveys will be conducted for nest sites and winter roost sites in 2007. Surveys may also be required prior to construction in 2008, if pipeline construction occurs during the breeding season (1-February through 15-August) or winter roosting season (1-November through 1-April).</p> <p>Procedures:</p>

**Keystone Pipeline Project
Survey Protocols for Illinois Special Status Species**

Species & Status	Survey Protocol
	<ol style="list-style-type: none"> 1. The bald eagle surveys will be conducted along river corridors or historical bald eagle nest/winter roosting sites that occur within 1-mile from the project Right-of-Way (ROW). Stands of coniferous or deciduous trees will be surveyed for active nest sites during the breeding season 2. Stands of coniferous or deciduous trees will be surveyed for active winter roost sites from 1 hour before sunrise or sunset to 1 hour after sunrise or sunset. 3. A helicopter will be used for the surveys. Whenever possible, two observers will be used to conduct the surveys. 4. Observations of individual eagles, nests, or roosting eagles will be recorded using Global Positioning Systems (GPS). The date, location, nest condition, activity status, nest condition, and habitat will be recorded for each sighting. 5. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR and the appropriate USFWS field office.
Raptors	<p>Survey Frequency: An aerial raptor survey effort will be conducted prior to leaf-out in the spring of 2007. The focus of this survey is to identify nest sites that would be directly impacted from construction activities.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1. Raptor surveys will be conducted along the entire proposed Project route, focusing on active and inactive nest sites that occur within the construction ROW. 2. A helicopter will be used for the raptor surveys. Whenever possible, two observers will be used to conduct the surveys. 3. Observations of raptors and nest sites will be recorded using GPS. The date, location, nest condition, activity status, raptor species, and habitat will be recorded for each sighting. 4. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR and the appropriate USFWS field office.

**Keystone Pipeline Project
Survey Protocols for Illinois Special Status Species**

Species & Status	Survey Protocol
<p>Barn Owl <i>Tyto alba</i> IL-E</p>	<p>Survey Frequency: Surveys will be conducted prior to construction in 2008 if pipeline construction occurs during the nesting season (March - June), if needed.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1. Surveys will be conducted at any old buildings, barns, or structures within the construction ROW between March and June, if construction was to occur during the nesting season for this species. 2. Surveys will be conducted during the day within abandoned structures to identify birds, and signs of birds (pellets, rodent bones, etc.). 3. Surveys will also be conducted at dusk to identify owls calling and exiting structures. 4. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR.
<p>Loggerhead shrike <i>Lanius ludovicianus</i> IL-T</p>	<p>Survey Frequency: Habitat and bird surveys will be conducted within the construction ROW in the Carlyle Lake Wildlife Management Area in 2007.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1. Surveys will be conducted within suitable nesting habitat during the nesting season (March through June) 2. Observations of all loggerhead shrikes will be recorded using GPS. The date, location, observations, age class, and habitat will be recorded for each sighting. 3. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR.
<p>Western Sand Darter <i>Ammocrypta clarum</i> IL-T</p>	<p>Survey Frequency: One habitat survey will be conducted in 2007 at the Kaskaskia River crossing to document habitat suitability, river characteristics (flow, water quality, substrate, etc.), and spawning habitat. If appropriate habitat conditions are present, occurrence surveys may be conducted to determine potential presence of this species at the project crossing.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1. If conducted, sampling surveys will occur only at the Kaskaskia River crossing.

**Keystone Pipeline Project
Survey Protocols for Illinois Special Status Species**

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Species & Status	Survey Protocol
	<ol style="list-style-type: none"> 2. Surveys will be conducted within a 200-m site that includes 100m both upstream and downstream of the pipeline crossing. 3. Fish should be collected with the appropriately sized seine. 4. All fish collected should be identified to species to establish presence/absence of western sand darters. 5. Fish collected in the seine should be transferred immediately into a bucket of freshwater or live cage placed in a suitable part of the stream to minimize injuries and mortalities to fish during processing. 6. If western sand darters are present, 1 to 3 voucher specimens should be retained by fixing in 10% formalin and preserving in 70% ethanol and identification verified by IDNR staff. 7. GPS coordinates, detailed locality information, date, collector, and habitat information will be collected for each voucher specimen. 8. If sampling permit is needed, other documentation and data management protocols will be followed in accordance with collection permit requirements. 9. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR.
<p>Massasauga <i>Sistrurus catenatus</i> FC; IL-E</p> <p>Kirtland's Snake <i>Clonophis kirtlandi</i> IL-T</p>	<p>Survey Frequency: Habitat surveys will be conducted in the spring of 2007 to determine if any suitable habitat exists within the construction ROW. After completion of the habitat surveys, ENSR will coordinate with IDNR to determine further survey requirements.</p> <p>Procedures: See attached Snake Study Plan. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR and the appropriate USFWS field office.</p>
<p>Decurrent false aster <i>Boltonia decurrens</i> FT; IL-T</p>	<p>Survey Frequency: One survey will be conducted in 2007 during the flowering period to determine presence within the construction ROW. 2008 pre-construction surveys would only be conducted in areas where this species was observed in 2007.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1. Occurrence surveys will occur in areas of "good" habitat within the construction ROW.

**Keystone Pipeline Project
Survey Protocols for Illinois Special Status Species**

Species & Status	Survey Protocol
<p>Eastern Fringed Orchid <i>Platanthera leucophaea</i> FT; IL-E</p>	<p>2. Habitats to be visited include:</p> <ol style="list-style-type: none"> a. Areas subject to periodic flooding such as: agricultural fields; ruderal sites; roadside ditches; base of levees near standing water; sloughs; pond margins; wet prairies; edges of, or openings within, floodplain forests. <p>3. Surveys will be conducted during the flowering period (usually late Aug. through Sept.) by a qualified botanist familiar with the species and trained to conduct rare plant surveys.</p> <ol style="list-style-type: none"> 4. Date, time, land use and/or habitat type, and number of asters observed will be recorded for each sighting. 5. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR and appropriate USFWS field office.
<p>Eastern Fringed Orchid <i>Platanthera leucophaea</i> FT; IL-E</p>	<p>Survey Frequency: One survey will be conducted in 2007 during the flowering period to determine presence within the construction ROW. 2008 pre-construction surveys would only be conducted in areas where this species was observed in 2007.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1. Surveys will occur in areas of "good" habitat that was identified during the 2006 habitat surveys. Surveys will occur within the construction ROW for the project. 2. Habitats to be visited include: <ol style="list-style-type: none"> a. Native prairie or native prairie remnants. 3. Surveys will be conducted during the flowering period (late-June to mid-July.) by a qualified botanist familiar with the species and trained to conduct rare plant surveys. 4. Date, time, observations, and land use and/or habitat type will be recorded for each sighting. 5. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR and the appropriate USFWS field office.

**Keystone Pipeline Project
Survey Protocols for Illinois Special Status Species**

Species & Status	Survey Protocol
<p>Prairie Spiderwort <i>Tradescantia bracteata</i> IL-T</p>	<p>Survey Frequency: One survey will be conducted in 2007 during the flowering period to determine presence within the construction ROW. 2008 pre-construction surveys would only be conducted in areas where this species was observed in 2007.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1. Surveys will occur in areas of "good" habitat that was identified during the 2006 habitat surveys. Surveys will occur within the construction ROW for the project. 2. Habitats to be visited include: <ol style="list-style-type: none"> a. Disturbed areas near roads or railroad ballasts in sandy or gravelly soil. 3. Surveys will be conducted during the flowering period (1-May through 1-June) by a qualified botanist familiar with the species and trained to conduct rare plant surveys. 4. Date, time, observations, and land use and/or habitat type will be recorded for each sighting. 5. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR.
<p>Royal Catchfly <i>Silene regia</i> IL-E</p>	<p>Survey Frequency: One survey will be conducted in 2007 during the flowering period to determine presence within the construction ROW. 2008 pre-construction surveys would only be conducted in areas where this species was observed in 2007.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1. Surveys will occur in areas of "good" habitat that was identified during the 2006 habitat surveys. Surveys will occur within the construction ROW for the project. 2. Habitats to be visited include: <ol style="list-style-type: none"> a. Sandy areas along roadsides, and gravel prairies. 3. Surveys will be conducted during the flowering period (usually late-May through Oct.) by a qualified botanist familiar with the species and trained to conduct rare plant surveys. 4. Date, time, land use and/or habitat type, and number observed will be recorded for each sighting. 5. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR.

**Keystone Pipeline Project
Survey Protocols for Illinois Special Status Species**

Species & Status	Survey Protocol
Spring Ladies Tresses <i>Spiranthes vernalis</i> IL-E	<p>Survey Frequency: One survey will be conducted in 2007 during the flowering period to determine presence within the construction ROW. 2008 pre-construction surveys would only be conducted in areas where this species was observed in 2007.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1. Surveyor will focus on visiting good potential habitat identified within the construction ROW and conduct presence/absence surveys for the species. 2. Habitats to be visited include: <ol style="list-style-type: none"> a. Mesic and dry upland prairies, roadsides through prairies. 3. Surveys will be conducted during the flowering period (June through August) by a qualified botanist familiar with the species and trained to conduct rare plant surveys. 4. Date, time, land use and/or habitat type, and number observed will be recorded for each sighting. 5. Qualifications of the surveyor, method of survey, and results of the survey will be submitted to the IDNR.
MBTA	TBD



U.S. Fish & Wildlife Service



United States Department of the Interior

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8588 ROUTE 148
MARION, ILLINOIS 62959

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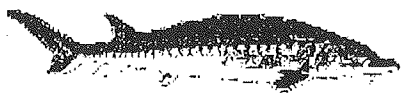
FACSIMILE TRANSMITTAL

TO: Russ Romme FAX: 513-326-1550

FROM: Joyce Collins DATE: 12/2/06

SUBJECT: Keystone Indiana PAGE 1 OF 8
bat Assessment

NOTES





November 30, 2006

0987.008.001

Joyce Collins
Assistant Field Supervisor
U.S. Fish & Wildlife Service
Marion Ecological Services Office
8588 Route 148
Marion, IL 62959-4565

Subject: Requesting concurrence with proposed Indiana bat investigations on Keystone Pipeline Project through four Illinois counties

Dear Joyce,

May we have your concurrence with the attached study plan dated November 2006 for "Indiana bat investigations on Keystone pipeline through four Illinois counties"? We expect to initiate field work beginning in early December. This version of the plan addresses your comments on the October version, and incorporates results of our telephone conversation earlier this week.

Sincerely,
BHE ENVIRONMENTAL, INC.

Russ Rommé
Director

- c: Charles Johnson (ENSR)
- Sara Stribley (ENSR)
- Vince Hand (BHE)

<input checked="" type="checkbox"/> CONCUR with edits on PAGES 3 & 4	Signature
	Name (print) Joyce A. Collins
<input type="checkbox"/> DO NOT CONCUR	Title Assistant Field Supervisor
	Date 12/2/03

11733 Chesterdale Road, Cincinnati, Ohio 45246 513.326.1500 / Fax 513.326.1550

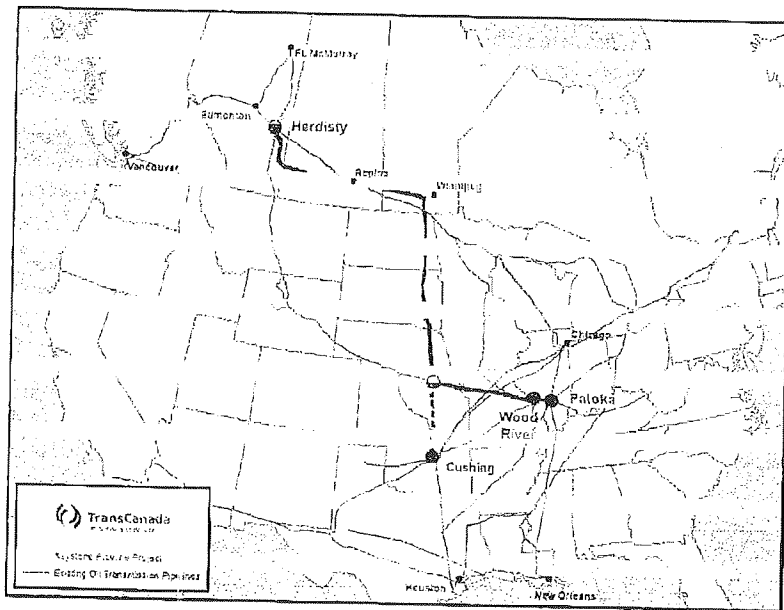
**PROPOSED INDIANA BAT INVESTIGATIONS
KEYSTONE PIPELINE PROJECT THROUGH FOUR ILLINOIS COUNTIES
NOVEMBER 2006**

1.0 INTRODUCTION

1.1 BACKGROUND

Keystone proposes to construct and operate an interstate crude oil transmission system from an oil supply hub near Hardisty, Alberta, in Canada to destinations in the U.S. (Figure 1). In the U.S., the Keystone Mainline will consist of 1,078 miles of new pipeline constructed from the U.S./Canadian border in Cavalier County, North Dakota, to existing terminals and refineries in Wood River (Madison County) and Patoka (Marion County), Illinois. The Keystone Mainline will consist of 1,023 miles of 30-inch pipe between the Canadian border and Wood River, Illinois and a 55-mile segment of 24-inch pipeline between Wood River and Patoka, Illinois. The Cushing Extension will consist of approximately 292 miles of 36-inch pipeline commencing in Platte County near the Nebraska-Kansas border and terminating at existing crude oil terminals in Cushing (Payne County), Oklahoma.

In Illinois, the majority of the Keystone Pipeline will be a 24-inch pipeline, and the project will be constructed within a 95-foot-wide corridor, consisting of both a temporary 45-foot-wide construction ROW and a 50-foot permanent ROW. A small segment of pipe from the Mississippi River to the Wood River terminal (less than 2 miles) will consist of 30-inch pipe and will be constructed within a 110-foot-wide corridor (temporary 60-foot-wide



construction ROW and a 50-foot permanent ROW). The pipeline typically will be buried with a minimum depth of cover of four feet. The pipeline will be constructed primarily in rural Illinois areas, with more populated areas occurring around Wood River and Edwardsville. Construction is scheduled to begin in early 2008 with an in-service date for the Keystone Mainline of no later than November 2009.

The construction of the Keystone Pipeline Project is subject to environmental review pursuant to the National Environmental Policy Act (NEPA). Because the project crosses the U.S.-Canadian border, the Department of State has been designated as the lead federal agency for the NEPA process.

Occurrences of the Indiana bat have been documented in two of the four counties traversed by the route in Illinois, Madison and Bond counties (Attachment 1). This study plan outlines

an approach to investigate the potential effects of the Keystone Pipeline Project on the Indiana bat in Illinois, including a field survey and a habitat assessment.

1.2 COMMUNICATION WITH US FISH AND WILDLIFE SERVICE

Russ Rommé of BHE Environmental, Inc. contacted Joyce Collins of the Marion, Illinois FWS office on September 8, 2006 to discuss Endangered Species Act compliance issues specifically pertaining to the potential for the Keystone Pipeline Project to affect Indiana bats in Illinois. Several phone calls to Joyce Collins followed in the subsequent week. On September 14, 2006 Joyce Collins contacted Russ Rommé (BHE) and provided recommendations regarding assessment of effects to Indiana bats and their habitat in Illinois. A teleconference was conducted on November 28, 2006 to discuss the content of this plan.

2.0 APPROACH

2.1 TECHNICAL BACKGROUND

Rommé et al. (1995) showed how number of potential Indiana bat roost trees (PRTs) per unit area affected habitat quality. Optimal habitat includes at least fourteen PRTs per hectare, and the quality of habitat declines linearly as the number of PRTs declines. The ratio of actual trees per hectare (T) to the optimal value of at least fourteen PRTs per hectare, gives a measure of habitat quality on a zero to one scale. If $T > 14$, the ratio is still one. Farmer et al. (2002) go so far as to recommend evaluation of a single variable, density of suitable roost trees, as appropriate for landscape scale assessments. Based on previous literature, those two studies define PRTs as having dbh ≥ 9 inches (≥ 22 cm).

Recent published literature indicates that linear distances between roosts and foraging areas for females range from approximately 0.5 to 8.4 km (0.8 to 5.2 miles), and average approximately 3.5 km (2.2 miles) (Murray and Kurta 2004, Sparks et al. 2005, Butchkoski and Hassinger 2002). Rommé et al. (1995) indicate that even with all other summer habitat attributes being ideal, sufficient nearby wooded area is a critical factor for suitable habitat. Wooded areas with 13 percent forest cover in the analysis area can rate no higher than 0.32 on a scale of 0.0 (no habitat value) to 1.0 (ideal habitat). For a suitability rating of 1.0 for this habitat parameter, there must be a minimum of 30% forested cover within 3.5 km.

Given this background, the study plan below combines site-specific and landscape-level data to classify wooded areas crossed by the pipeline ROW as high-, medium-, or low-quality habitat.

2.2 FIELD SURVEY

Biologists will assess the portion of all forested/wooded stands (woodlot) within a 200-foot wide survey corridor (100 feet either side of the pipeline centerline) crossed by the proposed pipeline right-of-way for the presence of PRTs. For purposes of this evaluation, PRTs will be dead or live trees, at least three meters tall, with at least 25% peeling or exfoliating bark, split tree trunks or branches, or cavities.

The biologists will record whether the tree is dead or living, the tree species (if possible), and dbh size class (<22 cm, 22 to <30 cm, 30 to <40 cm, 40 to <50 cm, ≥ 50 cm), if practical.

2.3 HABITAT ASSESSMENT

Upon completion of the field survey effort, Keystone will derive an assessment of habitat quality based on field parameters and a review of aerial photographs to determine forested cover within 3.5 kilometers of each site.

In addition to density, PRTs must meet minimum size criteria for the area represented by the sample site to qualify as high quality habitat, namely:

- at least eight PRTs per hectare greater than 30 cm dbh, or
- at least five PRTs per hectare greater than 40 cm dbh, or
- at least three PRTs per hectare greater than 50 cm dbh.

If all PRTs in a woodlot measure less than 20 cm dbh, then the suitability will be categorized as low for that parameter. Thus there will be three parameters considered: density of PRTs, dbh of PRTs, and nearby forest cover (Table 1).

Table 1. Suitability scores for various habitat parameters.

Category	PRT density (number/ha)/14	PRT dbh (trees/ha exceeding given dbh)	Forest cover within 3.5 km
High (score = 3)	≥ 0.60	8 PRT > 30 cm or 5 PRT > 40 cm or 3 PRT > 50 cm	$\geq 30\%$
Medium (score = 2)	≥ 0.40 & < 0.60	≥ 1 PRT ≥ 20 cm	$\geq 13\%$ & $< 30\%$
Low (score = 1)	< 0.40	< 1 PRT ≥ 20 cm	$< 13\%$

If no PRTs are found within the 200-foot wide survey corridor within a woodlot, we will conclude that project activities at that location may affect but are not likely to adversely affect Indiana bats. Otherwise, the three scores will be added together, and the overall habitat suitability determined from Table 2.

Table 2. Overall habitat suitability determination.

Sum of three scores from Table 1.	Habitat Suitability
≥ 7	High
6 or 5	Medium
≤ 4	Low

3.0 SCHEDULE

We expect to begin field work to assess habitat quality in early December, 2006.

4.0 FOLLOW-UP ACTIONS

Keystone will provide the Service with a summary of the field data collected and the overall habitat suitability evaluation for each woodlot (High, Medium, Low, no PRTs). We propose follow on field investigations (e.g., mist net surveys) only at sites with medium or high quality habitat scores as defined in Section 2.3 (Table 2), above. ~~If mist net survey results are negative at any site, we will conclude that proposed construction activities at the site that~~

Based on the data collected in the field survey and the classification in the habitat assessment, keystone will work with the FWS to determine appropriate ~~remove suitable Indiana bat habitat may affect, but are not likely to adversely affect Indiana~~ subsequent activities.
 bats. We understand the Section 7 finding needs to be made for the project as a whole rather than for each particular crossing of wooded habitat.
 Jan 11
 Call 5
 12/2/06

In our telephone conversation on November 28, 2006, we agreed there was limited value in the collection of additional data describing habitat quality (beyond that described in Section 2.3, above) at sites with low quality habitat or at sites with no PRTs.

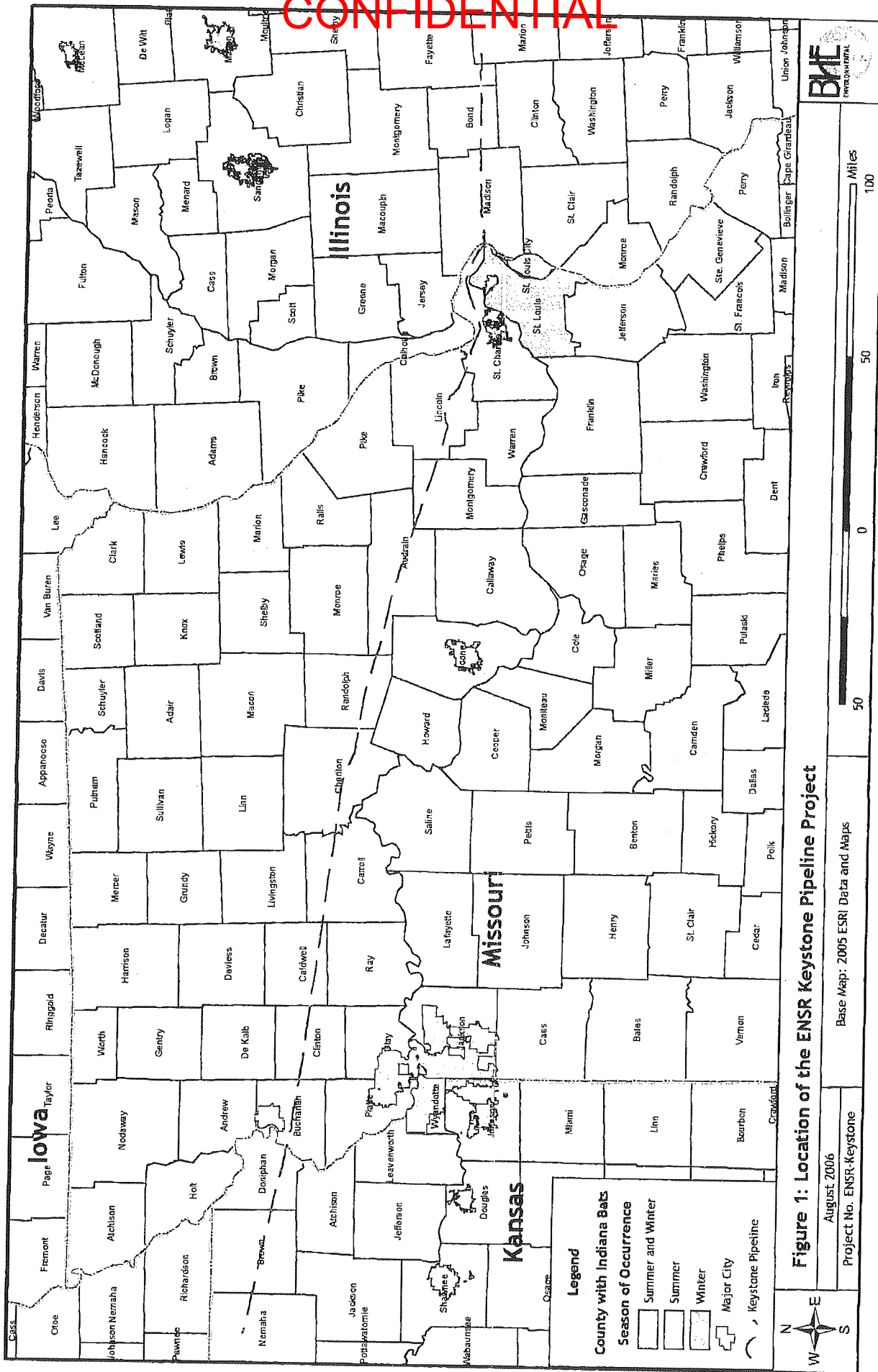
We further agreed that for those sites with no PRTs or sites with low quality roosting habitat, we would conduct a semi-quantitative, desktop assessment of Indiana bat habitat quality near each site. This analysis would quantify the percent forest cover within 3.5 km of each site, and would verify the absence of any Indiana bat occurrence records in the area. These data will be sufficient to characterize the effects to Indiana bats at the site.

We also agreed that at sites with no PRTs, or at sites with low habitat quality, project activities are not likely to adversely affect Indiana bats because effects would be insignificant or discountable (in the absence of any unusual circumstances such as proximity to a known occurrence).

5.0 LITERATURE CITED

- Butchkoski, C. and J. Hassinger. 2002. Ecology of a maternity colony roosting in a building. Pp. 13-142 in A. Kurta and J. Kennedy (eds.), *The Indiana Bat: Biology and Management of an Endangered Species*. Bat Conservation International, Austin, Texas.
- Farmer A.H., B.S. Cade, and D.F. Stauffer. 2002. Evaluation of a habitat suitability index model. Pp. 172-181 in A. Kurta and J. Kennedy (eds.), *The Indiana Bat: Biology and Management of an Endangered Species*. Bat Conservation International, Austin, Texas.
- Murray, S. and A. Kurta. 2004. Nocturnal activity of the endangered Indiana bat (*Myotis sodalis*). *Journal of Zoology* 262:197-206.
- Rommé, R., K. Tyrell, and V. Brack. 1995. Literature Summary and Habitat Suitability Index Model, Components of Summer Habitat for the Indiana Bat. Federal Aid Project E-1-7, No. 8. Indiana Department of Natural Resources, Bloomington.
- Sparks, D., C. Ritz, J. Duchamp, and J. Whitaker. 2005. Foraging habitat of the Indiana bat (*Myotis sodalis*) at an urban-rural interface. *Journal of Mammalogy* 86(4):713-718.

**Attachment 1. Indiana Bat Seasonal Occurrence near the Proposed
Keystone Pipeline Project Corridor in Illinois**



CONFIDENTIAL

RE ENSR pipeline snake discussion

From: SCOTT BALLARD [SCOTT.BALLARD@illinois.gov]
Sent: Wednesday, November 08, 2006 8:56 PM
To: Melanie Gregory
Subject: RE: ENSR pipeline snake discussion

Melanie, sorry for the delay. Yes, go with what you have. It looks good. I've been out of the office a lot.

Sorry,
Scott

>>> "Melanie Gregory" <mgregory@bheenvironmental.com> 11/08/06 3:51 PM
>>>

Hi Scott, at ENSR's urging, I'm following up again re: status of your review of the snake habitat assessment study plan. Our window to conduct this field work is rapidly closing and ENSR would like to get this habitat verification completed this year. Can you let me know your comments as soon as possible? If you have none and the plan is fine, please send me a note letting me know so that we can plan and schedule the field work before the winter weather arrives.

Thanks much,
Melanie Gregory
BHE Environmental, Inc.

-----Original Message-----

From: SCOTT BALLARD [mailto:SCOTT.BALLARD@illinois.gov]
Sent: Thursday, October 19, 2006 9:32 AM
To: Melanie Gregory
Subject: RE: ENSR pipeline snake discussion

Thanks for following up on that Melanie. If they talked to Todd Rettig, he is the guy in charge of the consultation section of IDNR. So looks like they've "officially" engaged in the process.

Scott

>>> "Melanie Gregory" <mgregory@bheenvironmental.com> 10/19/06 7:12 AM
>>>

Hi Scott- here's the response we got from ENSR regarding the filing of an AAR with the Springfield folks:

Melanie, the AAR for the project was mailed to Todd Rettig (IL DNR) in February 2006, so the project should be in the DNR system. In addition, we received sensitive species shape file data from Tara Kieninger (IL DNR NHD) in February 2006. ENSR also met with Bob Hammel, Rick Pietruska, Jeff Torricelli, and Lou Hannig of IL DNR in June 2006.

Consequently, I think we are in pretty good shape. Although we have not completed the EcoCat web application, this site appears to be another way of requesting NHD information. In addition, none of our IL contacts indicated that we needed to go through the EcoCat process. Nevertheless, we appreciate your comments and have a call into IL DNR to verify that we have made all of the appropriate contacts, including EcoCat.

So unless you see a need to file EcoCat after all, it looks as if we're good to go ahead with the review of the EMR and Kirtland's study plan, as we discussed yesterday. I look forward to receiving your comments, and appreciate your responsiveness.

Sincerely,

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RE ENSR pipeline snake discussion

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.com

www.bheenvironmental.com <<http://www.bheenvironmental.com/>>

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October 16, 2006

Illinois Department of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271

RE: Study Plan: Protected Snake Habitat Assessment on the Keystone Pipeline Project

To Whom It May Concern:

BHE Environmental, Inc. (BHE) has been contracted to conduct a habitat assessment for protected snake species that may occur along the proposed Keystone Pipeline Project in Illinois. The State of Illinois recognizes the eastern massasauga (*Sistrurus catenatus catenatus*) as a state endangered species and the Kirtland's snake (*Clonophis kirtlandii*) as a state threatened species. Neither of these species is currently federally listed, but the massasauga is a Federal Candidate species.

The Illinois Department of Natural Resources (IDNR) has indicated that Bond, Madison, Fayette, and Marion counties may contain habitat for massasaugas and Kirtland's snakes. BHE was contracted by ENSR Corporation (ENSR) to conduct a habitat assessment for these protected snake species within these counties along the Keystone Pipeline Project area. A detailed study plan is provided below.

Study Plan

Remote Habitat Assessment

The massasauga and Kirtland's snake are associated with wetlands, and habitat requirements for the two species are very similar. Both 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 also important indicators of habitat suitability. Recent research indicates that eastern massasaugas and Kirtland's snakes range widely through the landscape during the warm season but tend to hibernate in relatively small, specific areas. This suggests that suitable hibernacula for these snakes are limited; both species have been found to hibernate in areas with a high water table, but tend to avoid wetlands where surface soil is saturated. Closed forests and dense vegetation are also typically avoided, as are expanses of open water

In fall 2006, USGS topographic maps, aerial photography, National Wetlands Inventory (NWI) maps, and wetland delineation information were used to identify regions of the Keystone Pipeline Project area where suitable habitat for the eastern massasauga and Kirtland's snake may occur.



For purposes of the remote assessment, potential habitat is defined as any part of the construction corridor in which a wetland is known to occur in association with an open area, e.g., a field next to a wetland. Wetlands that are completely forested were eliminated as potential habitat, as were areas of prolonged inundation or year-round open water.

On-Site Habitat Assessment

Potential snake habitat identified during the remote habitat assessment will be field verified. During field verification, habitat will be categorized as either likely to support protected snake species (i.e., meets all habitat requirements), or not likely to support protected snake species (meets no requirements).

Habitat categorization will be based upon these requirements:

- Presence of seasonally or temporarily saturated ground, or proximity to a body of water such as a lake or pond.
- Presence of adjacent open areas such as fields or meadows.
- Presence and density of potential hibernacula such as crayfish burrows.

As presence of suitable hibernacula appear to be the limiting factor to these snakes' occurrence, categorization of "likely to support" will be highly dependent upon presence of potential hibernacula such as crayfish or small mammal burrows, submerged root masses, or other means by which snakes can access subsurface saturated ground. If potential hibernacula are sparse (fewer than 1 per 10 meter²), or if surface soil is saturated, the area will be categorized as "not likely to support" protected snake species.

Areas identified during the remote assessment that were not accurately represented in aerial photos or NWI maps (i.e., have since been altered) and are no longer suitable for these species will be eliminated from further study.

All areas categorized as "likely to support" protected snakes identified during the on-site survey will be described on a Site Description Data Sheet (attached) and the location recorded with GPS equipment. Photographs will be taken of all sites visited during the on-site habitat assessment and field verification.

Following the on-site habitat assessment, ENSR and BHE will reconvene with IDNR to review results, and discuss potential future monitoring efforts. If further survey or monitoring of snake habitat on the construction corridor is necessary, it will be coordinated through IDNR, with agency input.

If this plan is acceptable, please reply by e-mail, or sign this letter in the space provided below and return it by fax to me at 513.326.1178.

Should you have any questions or comments about the proposed study plan, please feel free to contact me by phone at 513.326.1175 or by e-mail at vhand@bheenvironmental.com.

Sincerely,



Vincent C. Hand, Ph.D.
Director, Natural Resources Management

Attachments

_____ I concur with the methods presented in this study plan

_____ I do not concur with the methods presented in this study plan
please provide additional guidance or explanation

_____ Signature

_____ Date

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Table showing location of wetland features by county and pipeline milepost numbers.

County	West Milepost	East Milepost
Madison	1017.6	1017.7
Madison	1019.3	1019.5
Madison	1022.5	1022.7
Madison	1023.9	1024
Madison	1025.3	1025.4
Madison	1032.2	1032.5
Madison	1036.4	1036.5
Madison	1038.1	1038.3
Madison	1041.4	1041.6
Bond	1048.8	1048.9
Bond	1049.4	1049.5
Bond	1050.7	1050.9
Bond	1051.1	
Bond	1051.7	
Bond	1052.4	1052.7
Bond	1054.1	1054.2
Bond	1054.7	1055
Bond	1056.4	1056.5
Bond	1057.2	1057.3
Bond	1057.9	1058
Bond	1063.8	1063.9
Fayette	1064.9	1068.1

Entries where only one milepost is provided indicate a wetland feature where the length along the pipeline right of way is less than ~ 300 ft.

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Site Description Data Sheet

Surveyor(s): _____ Date of Survey: _____

Location of Survey (Lat/Lon or UTM): _____

State: Missouri or Illinois County: _____

REX-West or Keystone Name of Feature/Wetland (assign): _____

General description of site: _____ Photo Number(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): _____

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

Type of water body: lake/pond stream river

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

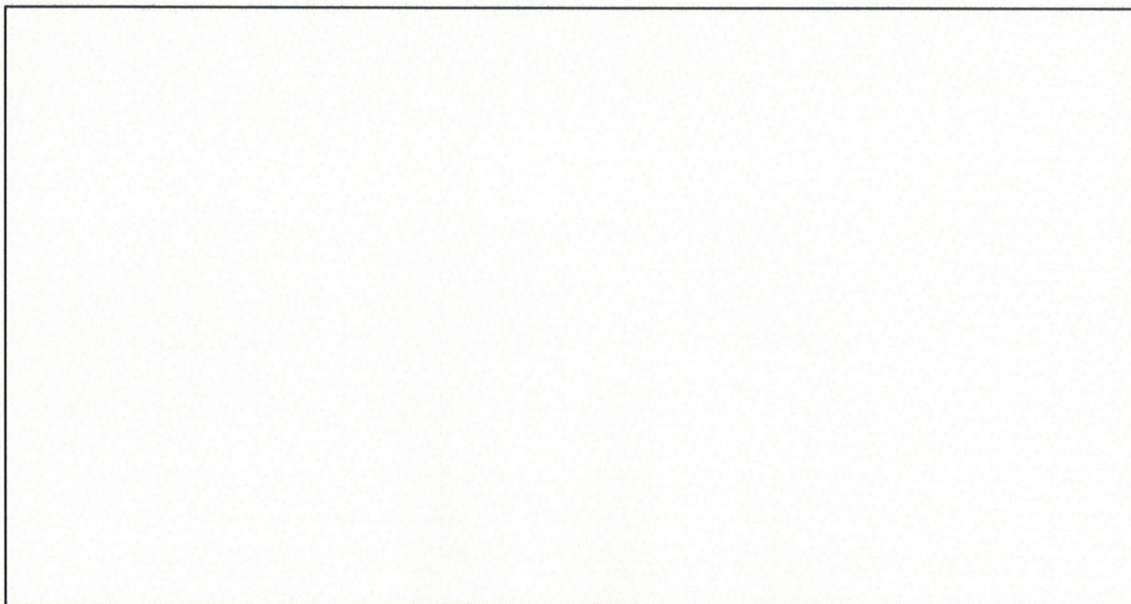
Describe other potential hibernacula present: _____

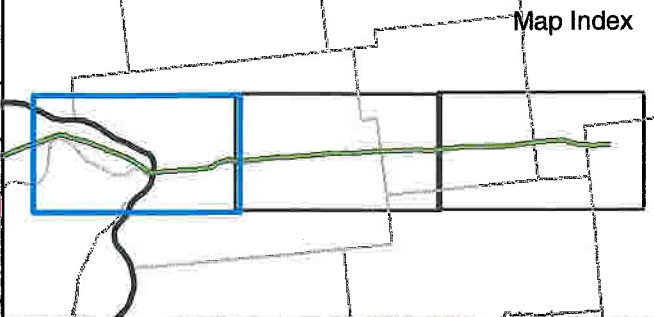
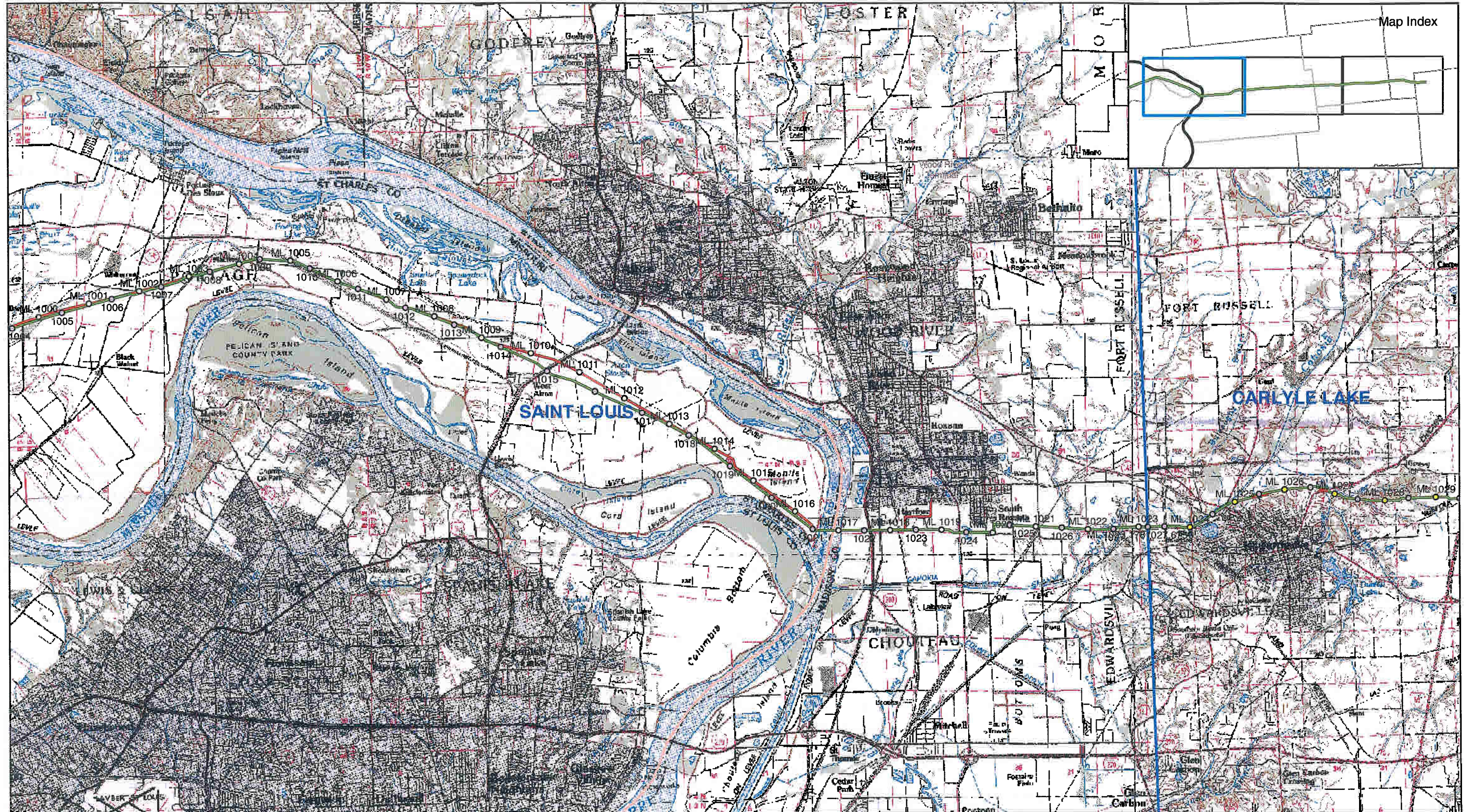
Are there trees in the area? Y / N If yes, estimated percent canopy closure: _____%

Dominant species (3): _____

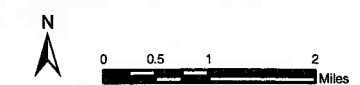
Notes:

Sketch of Survey Area (indicate mileposts):



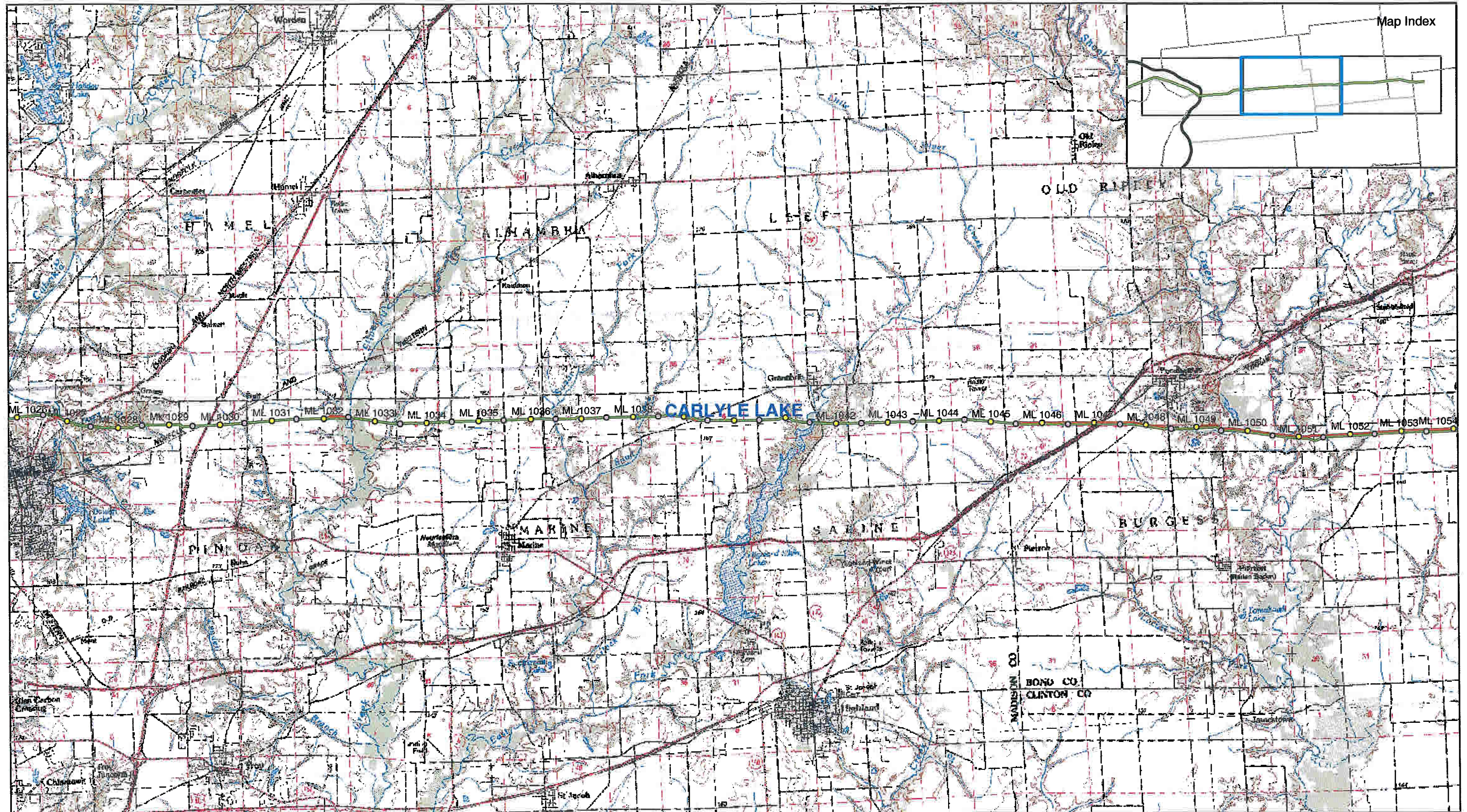


- ◊ Mileposts (8/17/06)
- ◊ Mileposts (2/9/06)
- Pipeline (8/17/06)
- Pipeline (2/9/06)

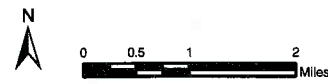


Keystone Pipeline Project
 **TransCanada**
In business to deliver

Map of 1 of 3
 General Project Location
 (Illinois)



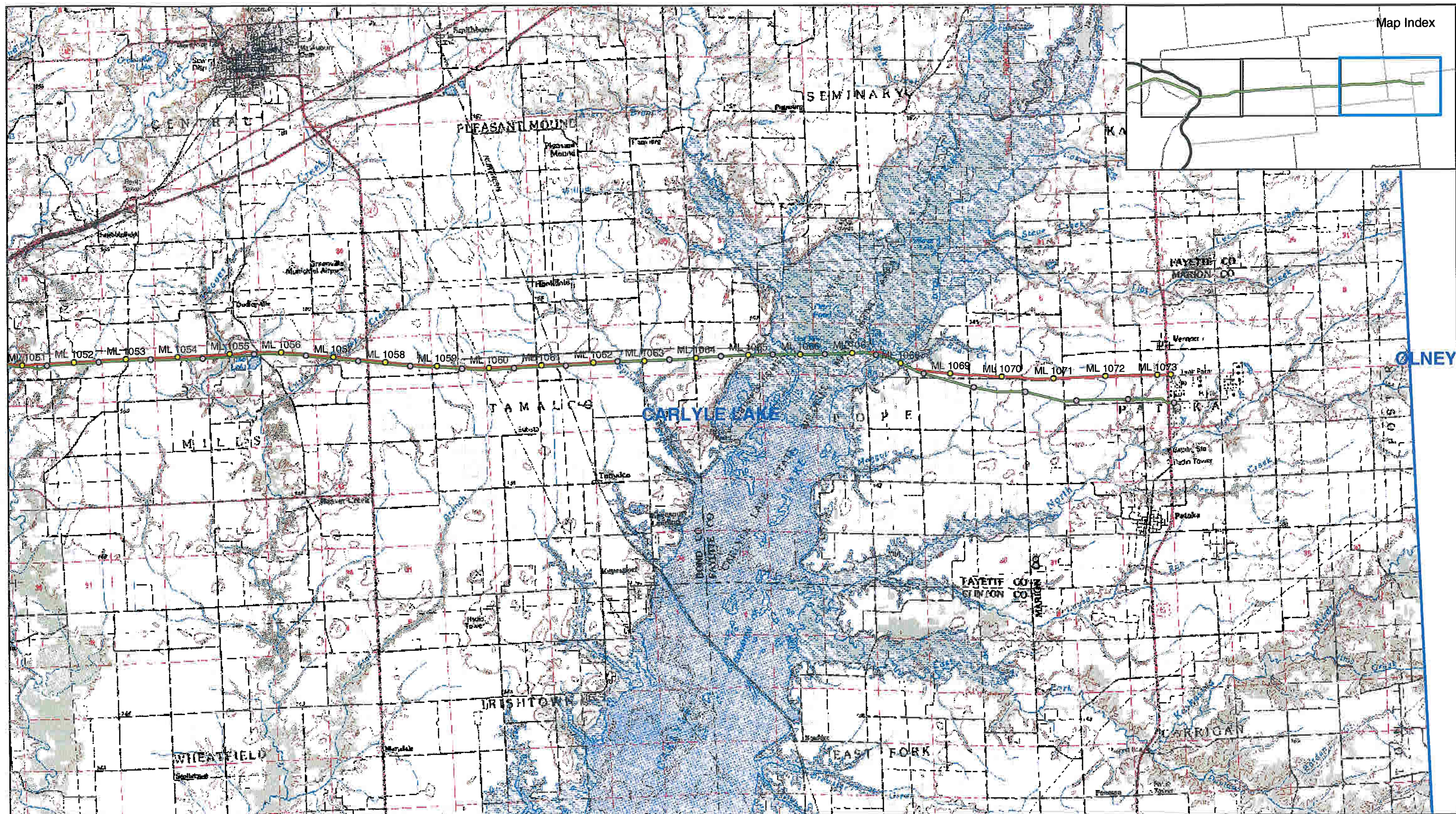
- ◊ Mileposts (8/17/06)
- ◊ Mileposts (2/9/06)
- Pipeline (8/17/06)
- Pipeline (2/9/06)



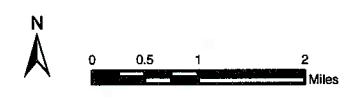
Keystone Pipeline Project



Map of 2 of 3
 General Project Location
 (Illinois)



- ◊ Mileposts (8/17/06)
- ◊ Mileposts (2/9/06)
- Pipeline (8/17/06)
- Pipeline (2/9/06)



Keystone Pipeline Project
 **TransCanada**
In business to deliver

Map of 3 of 3
 General Project Location
 (Illinois)

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Stribley, Sara

From: BOB HAMMEL [BOB.HAMMEL@illinois.gov]
Sent: Tuesday, January 16, 2007 8:24 AM
To: Stribley, Sara
Subject: RE: Keystone ENSR - Meeting with IDNR

Sara,

If it can be held locally, then I suggest the meeting take place at the Corps Carlyle Lake Mang. Office in Carlyle. They have a suitable conference room. That's where we have held the other meetings. Molly can give you more info on it or you can call the Corps office at 618-594-2484 and ask for Ranger Joe Smothers. If I can be of any other assistance, let me know.

Bob

>>> "Stribley, Sara" <sstribley@ensr.aecom.com> 01/15/07 2:48 PM >>>

Bob,

To answer your first question, biological surveys are planned for the following species in 2007:

Indiana Bat
River otter
Bald eagle
Loggerhead shrike
Eastern massasauga
Kirtland's snake
Decurrent false aster
Eastern prairie fringed orchid
Prairie spiderwort
Royal catchfly
Spring ladies' tresses

To answer your second question, we can definitely hold the meeting locally. I wasn't exactly sure where you were located, so I just left Springfield in as a question mark(?).

Please let me know if you have any other questions!

Thanks,

Sara

-----Original Message-----

From: BOB HAMMEL [mailto:BOB.HAMMEL@illinois.gov]
Sent: Monday, January 15, 2007 1:40 PM
To: Stribley, Sara
Subject: Re: Keystone ENSR - Meeting with IDNR

Sara,

I guess I have a couple of questions. First of all, what surveys are planned? And second, why do you want to hold the meeting in Springfield and who in Springfield do you want at this meeting? Field personnel don't set up meetings in Springfield. If you only need the people who have been attending the last three pipeline meetings, then we can set it up locally. Let me know. Otherwise, the Feb. 6th date is okay with me.

Bob Hammel

Site Supt.

Carlyle Lake SFWA

RR2, Box 233

Vandalia, IL 62471

68-425-3533

>>> "Stribley, Sara" <sstribley@ensr.aecom.com> 01/15/07 1:33 PM >>>

When: Tuesday, February 06, 2007 8:00 AM-10:00 AM (GMT-07:00) Mountain Time (US & Canada).

Where: Springfield, IL - IDNR Office

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~~*~*~*~*~*~*~*~*

Hello Bob,

ENSR would like to meet with an IDNR representative regarding the biological surveys that are planned for the Keystone Pipeline Project in 2007. I initially contacted Rick Pietruska to try and set up a meeting, but Rick may not be able to attend. Molly Giere (ENSR) recommended that I contact you as an alternative to set up a meeting with. Would the following meeting date and time work for you?

Date: Tuesday, February 6, 2007

Time: 8:00 - 10:00 am

Location: Springfield, IL - IDNR Office (? or other location)

ENSR is planning on sending out packages by the end of this week containing all of the information regarding the upcoming biological surveys for the Project in Illinois. We are hoping to use the information contained in this package as the template for discussions at the February meeting. Please feel free to invite other IDNR representatives if needed. Please let me know at your earliest convenience if you would or would not be able to attend this meeting, or if we should be coordinating with an alternative IDNR representative!

Sincerely,
Sara

Sara Stribley
ENSR | AECOM
1601 Prospect Parkway
Fort Collins, Colorado 80525
970-493-8878 ext 168
sstribley@ensr.aecom.com

Stribley, Sara

From: RICK PIETRUSZKA [RICK.PIETRUSZKA@illinois.gov]
Sent: Friday, January 05, 2007 10:22 AM
To: Stribley, Sara
Subject: Re: Keystone ENSR - Meeting with IDNR

Hi Sara, Is there a real need to meet at this time regarding surveys? Let me look over what ENSR's proposing first and we'll go from there. Thanks

Rick Pietruszka, Consultation Program
IDNR, Impact Analysis Section
Division of Ecosystems and Environment
217-785-4992.

>>> "Stribley, Sara" <sstribley@ensr.aecom.com> 1/4/2007 9:59 AM >>>

When: Tuesday, February 06, 2007 8:00 AM-10:00 AM (GMT-07:00) Mountain Time (US & Canada).
Where: Springfield, IL

~~*~*~*~*~*~*~*~*

Hi Rick,
ENSR would like to meet with you in early February to review the biological surveys that are planned for the Keystone Pipeline Project in 2007 and 2008 in Illinois. Would the following meeting date and time work for you?

Date: Tuesday, February 6, 2007
Time: 8:00 - 10:00 am
Location: Springfield, IL - IDNR Office

ENSR is planning on sending you a package by next week containing all of the information regarding the upcoming biological surveys for the Project. We are hoping to use the information contained in this package as the template for discussions at the February meeting. Please feel free to invite other IDNR representatives if needed. Please let me know at your earliest convenience if you would or would not be able to attend this meeting, or if we should be coordinating with an alternative IDNR or INHP representative!

Thanks and Happy New Year,
Sara

Sara Stribley
ENSR | AECOM
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970-493-8878 ext 168
sstribley@ensr.aecom.com