Appendix D

Biological Resources

Appendix D
South Bend Floristic Quality Assessment

Conservation Design Forum
Ecological Design Services • Landscape Architecture • Planning • Civil / Water Resources Engineering
Sustainable Urbanism • Ecosystem Sciences

Vegetation Memorandum for Record

Date:	October 10, 2011
To:	Pokagon Band of Potawatomi
From:	Gerould Wilhelm/Patrick Judd
Re:	Vegetation Assessment: Floristic Quality Assessment, Spring - Fall 2011
cc:	Mark Parrish
Ref. #:	11022.00 Pokagon Neighborhood Redevelopment (Rum Village)

Memo for Record

On May 4th, June 7th and September 20th the Rum Village site was visited to determine the extent to which any plant communities dominated by native vegetation remained. Four significant ones were discovered, of which two are quite impressive. All of the woodlands would become lush examples of the landscapes within which the people of the Pokagon Band once lived and from which drew nearly all their resources. When burned and appropriately thinned in the ancient way, these landscapes represent some of the more beautiful in the Midwest.

Although Rum Village is in Indiana, the coefficients of conservatism are those used by the state of Michigan, in order to make these areas more comparable to the Band's holdings in that state. It is expected that, as additional surveys are conducted, the Floristic Quality Indices will rise, but that the Mean C values will change little.

SITE UNITS

There is a small, fairly degraded, but irreplaceable remnant woodlot off the south end of Maple Road. If burned regularly and thinned appropriately, this **Southwest Woods** unit could be integrated into the public realm of the proposed plan. No Indiana state-listed plant species were noted, nor are there any likely to persist there. This woodland, if properly managed and disposed, would be in the line of sight for those entering the property off of Route 23. What follows is an inventory of the species noted.

FLORISTIC QUALITY DATA	Native	28	84.8%	Adventive	5	15.2%
28 NATIVE SPECIES	Tree	4	12.1%	Tree	0	0.0%
33 Total Species	Shrub	2	6.1%	Shrub	3	9.1%
3.9 NATIVE MEAN C	W-Vine	2	6.1%	W-Vine	0	0.0%
3.3 W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
20.4 NATIVE FQI	P-Forb	16	48.5%	P-Forb	1	3.0%
18.8 W/Adventives	B-Forb	0	0.0%	B-Forb	1	3.0%
1.8 NATIVE MEAN W	A-Forb	1	3.0%	A-Forb	0	0.0%
1.8 W/Adventives	P-Grass	0	0.0%	P-Grass	0	0.0%
AVG: Fac. Upland (+)	A-Grass	0	0.0%	A-Grass	0	0.0%
	P-Sedge	3	9.1%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Fern	0	0.0%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACESAU	5	Acer saccharum	3	FACU	Nt Tree	SUGAR MAPLE
ALLPET	0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
ALLTRI	5	Allium tricoccum	2	FACU+	Nt P-Forb	WILD LEEK
ARITRI	5	Arisaema triphyllum	-2	FACW-	Nt P-Forb	JACK IN THE PULPIT

CXBLAN	1	Carex blanda	0	FAC	Nt	P-Sedge	SEDGE
CXGRIS	3	Carex grisea	-3	FACW	Nt	P-Sedge	SEDGE
CXROSE	2	Carex rosea	5	UPL	Nt	P-Sedge	CURLY STYLED WOOD SEDGE
CIRLUT	2	Circaea lutetiana	3	FACU	Nt	P-Forb	ENCHANTER'S NIGHTSHADE
DENLAC	5	Dentaria laciniata	3	FACU	Nt	P-Forb	CUT LEAVED TOOTHWORT
DICCUC	7	Dicentra cucullaria	5	UPL	Nt	P-Forb	DUTCHMAN'S BREECHES
EUOOBO	5	Euonymus obovata	5	UPL	Nt	Shrub	RUNNING STRAWBERRY BUSH
FLOPRO	7	Floerkea proserpinacoides	-1	FAC+	Nt	A-Forb	FALSE MERMAID
FRAAME	5	Fraxinus americana	3	FACU	Nt	Tree	WHITE ASH
GEUCAN	1	Geum canadense	0	FAC	Nt	P-Forb	WHITE AVENS
HACVIR	1	Hackelia virginiana	1	FAC-	Nt	P-Forb	BEGGAR'S LICE
ISOBIT	8	Isopyrum biternatum	0	FAC	Nt	P-Forb	FALSE RUE ANEMONE
LAPCAN	4	Laportea canadensis	-3	FACW	Nt	P-Forb	WOOD NETTLE
LONMAA	0	LONICERA MAACKII	5	UPL	Ad	Shrub	AMUR HONEYSUCKLE
LONBEL	0	LONICERA XBELLA	3	FACU	Ad	Shrub	HYBRID HONEYSUCKLE
PARQUI	5	Parthenocissus quinquefolia	1	FAC-	Nt	W-Vine	VIRGINIA CREEPER
PODPEL	3	Podophyllum peltatum	3	FACU	Nt	P-Forb	MAY APPLE
POLPUB	5	Polygonatum pubescens	5	UPL	Nt	P-Forb	DOWNY SOLOMON SEAL
PRUSER	2	Prunus serotina	3	FACU	Nt	Tree	WILD BLACK CHERRY
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad	Shrub	MULTIFLORA ROSE
RUBALL	1	Rubus allegheniensis	2	FACU+	Nt	Shrub	COMMON BLACKBERRY
RUMOBT	0	RUMEX OBTUSIFOLIUS	-3	FACW	Ad	P-Forb	BITTER DOCK
SANCAA	5	Sanguinaria canadensis	4	FACU-	Nt	P-Forb	BLOODROOT
TOXRAR	2	Toxicodendron radicans	-1	FAC+	Nt	W-Vine	POISON IVY
TRIGRA	5	Trillium grandiflorum	5	UPL	Nt	P-Forb	COMMON TRILLIUM
TRIREC	8	Trillium recurvatum	4	FACU-	Nt	P-Forb	RED TRILLIUM
ULMAME	1	Ulmus americana	-2	FACW-	Nt	Tree	AMERICAN ELM
VIOPUB	4	Viola pubescens	4	FACU-	Nt	P-Forb	YELLOW VIOLET
VIOSOR	1	Viola sororia	1	FAC-	Nt	P-Forb	COMMON BLUE VIOLET

Off to the east of Maple Road, just as one enters from Prairie Avenue, is another very small **Woodlot**, a little higher in quality. Its position as a flank to a well signed and designed entrance could be quite a statement and emblem with regard to the nature of Pokagon Land and the beautiful way in which the people care for it.

FLORISTIC QUALITY DATA	Native	42	84.0%	Adventive	8	16.0%
42 NATIVE SPECIES	Tree	13	26.0%	Tree	0	0.0%
50 Total Species	Shrub	1	2.0%	Shrub	3	6.0%
4.2 NATIVE MEAN C	W-Vine	1	2.0%	W-Vine	0	0.0%
3.5 W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
27.0 NATIVE FQI	P-Forb	17	34.0%	P-Forb	3	6.0%
24.7 W/Adventives	B-Forb	0	0.0%	B-Forb	1	2.0%
1.8 NATIVE MEAN W	A-Forb	5	10.0%	A-Forb	1	2.0%
1.9 W/Adventives	P-Grass	1	2.0%	P-Grass	0	0.0%
AVG: Fac. Upland (+)	A-Grass	0	0.0%	A-Grass	0	0.0%
	P-Sedge	4	8.0%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Fern	0	0.0%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACESAU	5	Acer saccharum	3	FACU	Nt Tree	SUGAR MAPLE
ALLPET	0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
AMBTRI	0	Ambrosia trifida	-1	FAC+	Nt A-Forb	GIANT RAGWEED
ASACAN	5	Asarum canadense	5	UPL	Nt P-Forb	WILD GINGER
CXBLAN	1	Carex blanda	0	FAC	Nt P-Sedge	SEDGE
CXCEPP	3	Carex cephalophora	3	FACU	Nt P-Sedge	SEDGE
CXGRIS	3	Carex grisea	-3	FACW	Nt P-Sedge	SEDGE
CXPENS	4	Carex pensylvanica	5	UPL	Nt P-Sedge	SEDGE
CELOCC	5	Celtis occidentalis	1	FAC-	Nt Tree	HACKBERRY
CIRLUT	2	Circaea lutetiana	3	FACU	Nt P-Forb	ENCHANTER'S NIGHTSHADE
DENLAC	5	Dentaria laciniata	3	FACU	Nt P-Forb	CUT LEAVED TOOTHWORT
FAGGRA	6	Fagus grandifolia	3	FACU	Nt Tree	AMERICAN BEECH
FESSUB	5	Festuca subverticillata	2	FACU+	Nt P-Grass	NODDING FESCUE
FLOPRO	7	Floerkea proserpinacoides	-1	FAC+	Nt A-Forb	FALSE MERMAID
FRAAME	5	Fraxinus americana	3	FACU	Nt Tree	WHITE ASH
GALAPA	0	Galium aparine	3	FACU	Nt A-Forb	ANNUAL BEDSTRAW
GEUCAN	1	Geum canadense	0	FAC	Nt P-Forb	WHITE AVENS
GEUVER	6	Geum vernum	1	FAC-	Nt P-Forb	SPRING AVENS
HACVIR	1	Hackelia virginiana	1	FAC-	Nt P-Forb	BEGGAR'S LICE
HYDVIR	4	Hydrophyllum virginianum	-2	FACW-	Nt P-Forb	VIRGINIA WATERLEAF
IMPPAL	6	Impatiens pallida	-3	FACW	Nt A-Forb	PALE TOUCH ME NOT
JUGNIG	5	Juglans nigra	3	FACU	Nt Tree	BLACK WALNUT
LIRTUL	9	Liriodendron tulipifera	2	FACU+	Nt Tree	TULIP TREE
LONMAA	0	LONICERA MAACKII	5	UPL	Ad Shrub	AMUR HONEYSUCKLE
LONBEL	0	LONICERA XBELLA	3	FACU	Ad Shrub	HYBRID HONEYSUCKLE
OSMLON	3	Osmorhiza longistylis	4	FACU-	Nt P-Forb	SMOOTH SWEET CICELY
PARQUI	5	Parthenocissus quinquefolia	1	FAC-	Nt W-Vine	VIRGINIA CREEPER
POLBIB	4	Polygonatum biflorum	3	FACU	Nt P-Forb	SOLOMON SEAL
POLVIM	4	Polygonum virginianum	0	FAC	Nt P-Forb	JUMPSEED
PRUSER	2	Prunus serotina	3	FACU	Nt Tree	WILD BLACK CHERRY
QUEALB	5	Quercus alba	3	FACU	Nt Tree	WHITE OAK
QUERUB	5	Quercus rubra	3	FACU	Nt Tree	RED OAK
QUEVEL	6	Quercus velutina	5	UPL	Nt Tree	BLACK OAK
RANABO	0	Ranunculus abortivus	-2	FACW-	Nt A-Forb	SMALL FLOWERED BUTTERCUP
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad Shrub	MULTIFLORA ROSE
RUMOBT	0	RUMEX OBTUSIFOLIUS	-3	FACW	Ad P-Forb	BITTER DOCK
SANCAA	5	Sanguinaria canadensis	4	FACU-	Nt P-Forb	BLOODROOT
SASALB	5	Sassafras albidum	3	FACU	Nt Tree	SASSAFRAS
SEDSAR	0	SEDUM SARMENTOSUM	5	UPL	Ad P-Forb	STRINGY STONECROP
SMIRAC	5	Smilacina racemosa	3	FACU	Nt P-Forb	FALSE SPIKENARD
SOLCAE	7	Solidago caesia	3	FACU	Nt P-Forb	BLUE STEMMED GOLDENROD
STEMED	0	STELLARIA MEDIA	3	FACU	Ad A-Forb	COMMON CHICKWEED
TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad P-Forb	COMMON DANDELION
TILAME	5	Tilia americana	3	FACU	Nt Tree	BASSWOOD
TRIREC	8	Trillium recurvatum	4	FACU-	Nt P-Forb	RED TRILLIUM
ULMAME	1	Ulmus americana	-2	FACW-	Nt Tree	AMERICAN ELM
VIBPRU	7	Viburnum prunifolium	3	FACU	Nt Shrub	BLACK HAW
VIOPUB	4	Viola pubescens	4	FACU-	Nt P-Forb	YELLOW VIOLET
VIOSOR	1	Viola sororia	1	FAC-	Nt P-Forb	COMMON BLUE VIOLET
VIOSTR	5	Viola striata	-3	FACW	Nt P-Forb	CREAM VIOLET

Just off of Locust Street, west of the fine old house with the great Sugar Maple Tree, there is a wooded ridge system that runs as far as the high tension lines. This is **Southeast Woods** unit is a remarkably intact remnant. So far this spring, 88 native species have been recorded with a rare, high-quality mean coefficient of the conservatism of 4.9. If the ambient landscape were cleaned up, restored and programmed appropriately, these woods would be visible from throughout the site, a constant reminder of the beautiful land of the Pokagon Band and of the gentle but knowledgeable way in which they care for their remnant landscapes. Although none were noted during this initial inventory, if there are state-listed species at Rum Village, they are likely to be either in this tract or in the West Woods.

FLORISTIC QUALITY DATA	Native	88	92.6%	Adventive	7	7.4%
88 NATIVE SPECIES	Tree	13	13.7%	Tree	2	2.1%
95 Total Species	Shrub	4	4.2%	Shrub	3	3.2%
4.9 NATIVE MEAN C	W-Vine	3	3.2%	W-Vine	0	0.0%
4.6 W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
46.3 NATIVE FQI	P-Forb	46	48.4%	P-Forb	1	1.1%
44.5 W/Adventives	B-Forb	0	0.0%	B-Forb	1	1.1%
2.0 NATIVE MEAN W	A-Forb	5	5.3%	A-Forb	0	0.0%
1.9 W/Adventives	P-Grass	4	4.2%	P-Grass	0	0.0%
AVG: Fac. Upland (+)	A-Grass	0	0.0%	A-Grass	0	0.0%
	P-Sedge	9	9.5%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Fern	4	4.2%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACESAU	5	Acer saccharum	3	FACU	Nt Tree	SUGAR MAPLE
ACTPAC	7	Actaea pachypoda	5	UPL	Nt P-Forb	DOLL'S EYES
ACTRUB	7	Actaea rubra	5	UPL	Nt P-Forb	RED BANEBERRY
ALLPET	0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
ALLTRI	5	Allium tricoccum	2	FACU+	Nt P-Forb	WILD LEEK
ANEQUI	5	Anemone quinquefolia	0	FAC	Nt P-Forb	WOOD ANEMONE
AQUCAN	5	Aquilegia canadensis	1	FAC-	Nt P-Forb	WILD COLUMBINE
ARITRI	5	Arisaema triphyllum	-2	FACW-	Nt P-Forb	JACK IN THE PULPIT
ASACAN	5	Asarum canadense	5	UPL	Nt P-Forb	WILD GINGER

ASITRI	9	Asimina triloba	0	FAC	Nt	Tree	PAWPAW
ATHFIL	4	Athyrium filix-femina	0	FAC	Nt	Fern	LADY FERN
ATHTHE	6	Athyrium thelypterioides	0	FAC	Nt	Fern	SILVERY SPLEENWORT
CARDOU	6	Cardamine douglassii	-3	FACW	Nt	P-Forb	PINK SPRING CRESS
CARPAR	10	Cardamine parviflora	0	FAC	Nt	A-Forb	DRYLAND BITTER CRESS
CXALBU	5	Carex albursina	5	UPL	Nt	P-Sedge	SEDGE
CXBLAN	1	Carex blanda	0	FAC	Nt	P-Sedge	SEDGE
CXDIGI	5	Carex digitalis	5	UPL	Nt	P-Sedge	SEDGE
CXHIRI	5	Carex hirtifolia	5	UPL	Nt	P-Sedge	SEDGE
CXJAME	8	Carex jamesii	5	UPL	Nt	P-Sedge	JAMES' SEDGE
CXLEPO	3	Carex leptonervia	0	FAC	Nt	P-Sedge	SEDGE
CXROSE	2	Carex rosea	5	UPL	Nt	P-Sedge	CURLY STYLED WOOD SEDGE
CXSPAR	5	Carex sparganioides	0	FAC	Nt	P-Sedge	SEDGE
CXSWAN	4	Carex swanii	3	FACU	Nt	P-Sedge	SEDGE
CARCOR	5	Carya cordiformis	0	FAC	Nt	Tree	BITTERNUT HICKORY
CAUTHA	5	Caulophyllum thalictroides	5	UPL	Nt	P-Forb	BLUE COHOSH
CELOCC	5	Celtis occidentalis	1	FAC-	Nt	Tree	HACKBERRY
CIRLUT	2	Circaea lutetiana	3	FACU	Nt	P-Forb	ENCHANTER'S NIGHTSHADE
CLAVIR	4	Claytonia virginica	3	FACU	Nt	P-Forb	SPRING BEAUTY
CORALT	5	Cornus alternifolia	5	UPL	Nt	Tree	ALTERNATE LEAVED DOGWOOD
CYSPRO	5	Cystopteris protrusa	5	UPL	Nt	Fern	FRAGILE FERN
DENLAC	5	Dentaria laciniata	3	FACU	Nt	P-Forb	CUT LEAVED TOOTHWORT
DICCAN	7	Dicentra canadensis	5	UPL	Nt	P-Forb	SQUIRREL CORN
DICCUC	7	Dicentra cucullaria	5	UPL	Nt	P-Forb	DUTCHMAN'S BREECHES
DRYCAR	5	Dryopteris carthusiana	-2	FACW-	Nt	Fern	SPINULOSE WOODFERN
ERIBUL	10	Erigenia bulbosa	5	UPL	Nt	P-Forb	HARBINGER OF SPRING
ERYAME	5	Erythronium americanum	5	UPL	Nt	P-Forb	YELLOW TROUT LILY
FESSUB	5	Festuca subverticillata	2	FACU+	Nt	P-Grass	NODDING FESCUE
FLOPRO	7	Floerkea proserpinacoides	-1	FAC+	Nt	A-Forb	FALSE MERMAID
FRAAME	5	Fraxinus americana	3	FACU	Nt	Tree	WHITE ASH
FRAPEN	2	Fraxinus pennsylvanica	-3	FACW	Nt	Tree	RED ASH
GALAPA	0	Galium aparine	3	FACU	Nt	A-Forb	ANNUAL BEDSTRAW
GALTRR	4	Galium triflorum	2	FACU+	Nt	P-Forb	FRAGRANT BEDSTRAW
GEUCAN	1	Geum canadense	0	FAC	Nt	P-Forb	WHITE AVENS
GLYSTR	4	Glyceria striata	-5	OBL	Nt	P-Grass	FOWL MANNA GRASS
HACVIR	1	Hackelia virginiana	1	FAC-	Nt	P-Forb	BEGGAR'S LICE
HEPACU	8	Hepatica acutiloba	5	UPL	Nt	P-Forb	SHARP LOBED HEPATICA
HYDAPP	7	Hydrophyllum appendiculatum	5	UPL	Nt	P-Forb	GREAT WATERLEAF
HYDCAE	7	Hydrophyllum canadense	-2	FACW-	Nt	P-Forb	CANADA WATERLEAF
HYDVIR	4	Hydrophyllum virginianum	-2	FACW-	Nt	P-Forb	VIRGINIA WATERLEAF
HYSPAT	5	Hystrix patula	5	UPL	Nt	P-Grass	BOTTLEBRUSH GRASS
IMPCAP	2	Impatiens capensis	-3	FACW	Nt	A-Forb	SPOTTED TOUCH ME NOT
IMPPAL	6	Impatiens pallida	-3	FACW	Nt	A-Forb	PALE TOUCH ME NOT
ISOBIT	8	Isopyrum biternatum	0	FAC	Nt	P-Forb	FALSE RUE ANEMONE
LAPCAN	4	Laportea canadensis	-3	FACW	Nt	P-Forb	WOOD NETTLE
LINBEN	7	Lindera benzoin	-2	FACW-	Nt	Shrub	SPICEBUSH
LIRTUL	9	Liriodendron tulipifera	2	FACU+	Nt	Tree	TULIP TREE
LONMAA	0	LONICERA MAACKII	5	UPL	Ad	Shrub	AMUR HONEYSUCKLE
LONBEL	0	LONICERA XBELLA	3	FACU	Ad	Shrub	HYBRID HONEYSUCKLE
MENCAN	5	Menispermum canadense	0	FAC	Nt	W-Vine	MOONSEED
OSMLON	3	Osmorhiza longistylis	4	FACU-	Nt	P-Forb	SMOOTH SWEET CICELY
PARQUI	5	Parthenocissus quinquefolia	1	FAC-	Nt	W-Vine	VIRGINIA CREEPER
PHLDIV	5	Phlox divaricata	3	FACU	Nt	P-Forb	WOODLAND PHLOX
POASYL	8	Poa sylvestris	0	FAC	Nt	P-Grass	WOODLAND BLUEGRASS
PODPEL	3	Podophyllum peltatum	3	FACU	Nt	P-Forb	MAY APPLE
POLBIB	4	Polygonatum biflorum	3	FACU	Nt	P-Forb	SOLOMON SEAL
POLPUB	5	Polygonatum pubescens	5	UPL	Nt	P-Forb	DOWNY SOLOMON SEAL
POLVIM	4	Polygonum virginianum	0	FAC	Nt	P-Forb	JUMPSEED
PREALB	5	Prenanthes alba	3	FACU	Nt	P-Forb	WHITE LETTUCE
PRUSER	2	Prunus serotina	3	FACU	Nt	Tree	WILD BLACK CHERRY
PRUVIR	2	Prunus virginiana	1	FAC-	Nt	Shrub	CHOKE CHERRY
QUERUB	5	Quercus rubra	3	FACU	Nt	Tree	RED OAK
QUEVEL	6	Quercus velutina	5	UPL	Nt	Tree	BLACK OAK
RANHIS	5	Ranunculus hispidus	0	FAC	Nt	P-Forb	SWAMP BUTTERCUP
RHUTYP	2	Rhus typhina	5	UPL	Nt	Tree	STAGHORN SUMAC
RIBCYN	4	Ribes cynosbati	5	UPL	Nt	Shrub	PRICKLY or WILD GOOSEBERRY
ROBPSE	0	ROBINIA PSEUDOACACIA	4	FACU-	Ad	Tree	BLACK LOCUST
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad	Shrub	MULTIFLORA ROSE
RUMOBT	0	RUMEX OBTUSIFOLIUS	-3	FACW	Ad	P-Forb	BITTER DOCK
SALALB	0	SALIX ALBA	-3	FACW	Ad	Tree	WHITE WILLOW
SAMCAN	3	Sambucus canadensis	-2	FACW-	Nt	Shrub	ELDERBERRY
SANCAA	5	Sanguinaria canadensis	4	FACU-	Nt	P-Forb	BLOODROOT
SANGRE	2	Sanicula gregaria	-1	FAC+	Nt	P-Forb	BLACK SNAKEROOT
SCRMAR	5	Scrophularia marilandica	4	FACU-	Nt	P-Forb	LATE FIGWORT
SMIRAC	5	Smilacina racemosa	3	FACU	Nt	P-Forb	FALSE SPIKENARD
SMITAM	5	Smilax tamnoides	0	FAC	Nt	W-Vine	BRISTLY GREEN BRIER
SOLCAE	7	Solidago caesia	3	FACU	Nt	P-Forb	BLUE STEMMED GOLDENROD
SOLHIS	3	Solidago hispida	5	UPL	Nt	P-Forb	WHITE GOLDENROD
STYDIP	10	Stylophorum diphyllum	5	UPL	Nt	P-Forb	WOOD POPPY

TILAME	5	Tilia americana	3	FACU	Nt Tree	BASSWOOD
TRIGRA	5	Trillium grandiflorum	5	UPL	Nt P-Forb	COMMON TRILLIUM
TRIREC	8	Trillium recurvatum	4	FACU-	Nt P-Forb	RED TRILLIUM
VIOCAN	5	Viola canadensis	5	UPL	Nt P-Forb	CANADA VIOLET
VIOPUB	4	Viola pubescens	4	FACU-	Nt P-Forb	YELLOW VIOLET
VIOSOR	1	Viola sororia	1	FAC-	Nt P-Forb	COMMON BLUE VIOLET
VIOSTR	5	Viola striata	-3	FACW	Nt P-Forb	CREAM VIOLET

Just southeast of the South Woods and west of Locust Road is a **Wet Mesic** unit, both of which have been degraded by stormwater runoff. The quality could improve marginally if the wetland were to be burned annually, but dramatic improvements cannot occur until the stormwater issues have been resolved.

FLORISTIC QUALITY DATA	Native	43	82.7%	Adventive	9	17.3%
43 NATIVE SPECIES	Tree	7	13.5%	Tree	0	0.0%
52 Total Species	Shrub	3	5.8%	Shrub	1	1.9%
3.2 NATIVE MEAN C	W-Vine	3	5.8%	W-Vine	0	0.0%
2.6 W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
20.7 NATIVE FQI	P-Forb	16	30.8%	P-Forb	4	7.7%
18.9 W/Adventives	B-Forb	0	0.0%	B-Forb	2	3.8%
-0.9 NATIVE MEAN W	A-Forb	6	11.5%	A-Forb	0	0.0%
-0.4 W/Adventives	P-Grass	3	5.8%	P-Grass	2	3.8%
AVG: Faculative (+)	A-Grass	0	0.0%	A-Grass	0	0.0%
	P-Sedge	4	7.7%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Fern	1	1.9%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACESAI	2	Acer saccharinum	-3	FACW	Nt Tree	SILVER MAPLE
ALLPET	0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
AMBTRI	0	Ambrosia trifida	-1	FAC+	Nt A-Forb	GIANT RAGWEED
ARCMIN	0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
ARITRI	5	Arisaema triphyllum	-2	FACW-	Nt P-Forb	JACK IN THE PULPIT
ASTLAN	2	Aster lanceolatus	-3	FACW	Nt P-Forb	EASTERN LINED ASTER
ASTLAT	2	Aster lateriflorus	-2	FACW-	Nt P-Forb	SIDE FLOWERING ASTER
BOECYL	5	Boehmeria cylindrica	-5	OBL	Nt P-Forb	FALSE NETTLE
BROINE	0	BROMUS INERMIS	5	UPL	Ad P-Grass	SMOOTH BROME
CALSEP	2	Calystegia sepium	0	FAC	Nt P-Forb	HEDGE BINDWEED
CXGRIS	3	Carex grisea	-3	FACW	Nt P-Sedge	SEDGE
CXHIRI	5	Carex hirtifolia	5	UPL	Nt P-Sedge	SEDGE
CXRADI	2	Carex radiata	1	FAC-	Nt P-Sedge	STRAIGHT STYLED WOOD SEDGE
CXSTIP	1	Carex stipata	-5	OBL	Nt P-Sedge	SEDGE
CIRLUT	2	Circaea lutetiana	3	FACU	Nt P-Forb	ENCHANTER'S NIGHTSHADE
CIRARV	0	CIRSIUM ARVENSE	3	FACU	Ad P-Forb	CANADIAN THISTLE
CRYCAN	2	Cryptotaenia canadensis	0	FAC	Nt P-Forb	HONEWORT
FRAPEN	2	Fraxinus pennsylvanica	-3	FACW	Nt Tree	RED ASH
GALAPA	0	Galium aparine	3	FACU	Nt A-Forb	ANNUAL BEDSTRAW
GEUCAN	1	Geum canadense	0	FAC	Nt P-Forb	WHITE AVENS
GEUVER	6	Geum vernum	1	FAC-	Nt P-Forb	SPRING AVENS
GLYSTR	4	Glyceria striata	-5	OBL	Nt P-Grass	FOWL MANNA GRASS
HACVIR	1	Hackelia virginiana	1	FAC-	Nt P-Forb	BEGGAR'S LICE
HESMAT	0	HESPERIS MATRONALIS	5	UPL	Ad P-Forb	DAME'S ROCKET
IMPCAP	2	Impatiens capensis	-3	FACW	Nt A-Forb	SPOTTED TOUCH ME NOT
IRIVIR	5	Iris virginica	-5	OBL	Nt P-Forb	SOUTHERN BLUE FLAG
JUGNIG	5	Juglans nigra	3	FACU	Nt Tree	BLACK WALNUT
LEEVIR	5	Leersia virginica	-3	FACW	Nt P-Grass	WHITE GRASS
LEMMIN	5	Lemna minor	-5	OBL	Nt A-Forb	SMALL DUCKWEED
LINBEN	7	Lindera benzoin	-2	FACW-	Nt Shrub	SPICEBUSH
LIRTUL	9	Liriodendron tulipifera	2	FACU+	Nt Tree	TULIP TREE
LYSNUM	0	LYSIMACHIA NUMMULARIA	-4	FACW+	Ad P-Forb	MONEYWORT
ONOSEN	2	Onoclea sensibilis	-3	FACW	Nt Fern	SENSITIVE FERN
OXAFON	0	Oxalis fontana	3	FACU	Nt P-Forb	YELLOW WOOD SORREL
PARQUI	5	Parthenocissus quinquefolia	1	FAC-	Nt W-Vine	VIRGINIA CREEPER
PHAARU	0	Phalaris arundinacea	-4	FACW+	Nt P-Grass	REED CANARY GRASS
PLAOCC	7	Platanus occidentalis	-3	FACW	Nt Tree	SYCAMORE
POATRI	0	POA TRIVIALIS	-3	FACW	Ad P-Grass	BLUEGRASS
POLPUN	5	Polygonum punctatum	-5	OBL	Nt A-Forb	SMARTWEED
POLVIM	4	Polygonum virginianum	0	FAC	Nt P-Forb	JUMPSEED
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad Shrub	MULTIFLORA ROSE
RUBOCC	1	Rubus occidentalis	5	UPL	Nt Shrub	BLACK RASPBERRY
RUMPAT	0	RUMEX PATIENTIA	5	UPL	Ad P-Forb	PATIENCE DOCK

SAMCAN	3	Sambucus canadensis	-2	FACW-	Nt Shrub	ELDERBERRY
SMIECI	6	Smilax ecirrhata	5	UPL	Nt P-Forb	UPRIGHT CARRION FLOWER
SOLALT	1	Solidago altissima	3	FACU	Nt P-Forb	TALL GOLDENROD
TILAME	5	Tilia americana	3	FACU	Nt Tree	BASSWOOD
TOXRAR	2	Toxicodendron radicans	-1	FAC+	Nt W-Vine	POISON IVY
ULMAME	1	Ulmus americana	-2	FACW-	Nt Tree	AMERICAN ELM
URTDIO	1	Urtica dioica	-1	FAC+	Nt P-Forb	NETTLE
VITRIP	3	Vitis riparia	-2	FACW-	Nt W-Vine	RIVERBANK GRAPE
WOLCOL	5	Wolffia columbiana	-5	OBL	Nt A-Forb	COMMON WATER MEAL

West of the transmission line there is another wooded tract, the **Southcentral Woods**, the eastern portion of which is higher in quality than the western and quite similar in potential to the Southeast Woods.

FLORISTIC QUALITY DATA	Native	83	91.2%	Adventive	8	8.8%
83 NATIVE SPECIES	Tree	20	22.0%	Tree	0	0.0%
91 Total Species	Shrub	5	5.5%	Shrub	5	5.5%
4.3 NATIVE MEAN C	W-Vine	5	5.5%	W-Vine	0	0.0%
3.9 W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
39.0 NATIVE FQI	P-Forb	34	37.4%	P-Forb	1	1.1%
37.2 W/Adventives	B-Forb	0	0.0%	B-Forb	2	2.2%
1.4 NATIVE MEAN W	A-Forb	3	3.3%	A-Forb	0	0.0%
1.4 W/Adventives	P-Grass	5	5.5%	P-Grass	0	0.0%
AVG: Faculative (-)	A-Grass	0	0.0%	A-Grass	0	0.0%
	P-Sedge	10	11.0%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Fern	1	1.1%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACENEG	0	Acer negundo	-2	FACW-	Nt Tree	BOX ELDER
ACESAU	5	Acer saccharum	3	FACU	Nt Tree	SUGAR MAPLE
ACTPAC	7	Actaea pachypoda	5	UPL	Nt P-Forb	DOLL'S EYES
ALLPET	0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
ARCMIN	0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
ARITRI	5	Arisaema triphyllum	-2	FACW-	Nt P-Forb	JACK IN THE PULPIT
ASACAN	5	Asarum canadense	5	UPL	Nt P-Forb	WILD GINGER
ASITRI	9	Asimina triloba	0	FAC	Nt Tree	PAWPAW
ASTLAN	2	Aster lanceolatus	-3	FACW	Nt P-Forb	EASTERN LINED ASTER
ASTLAT	2	Aster lateriflorus	-2	FACW-	Nt P-Forb	SIDE FLOWERING ASTER
ATHFIL	4	Athyrium filix-femina	0	FAC	Nt Fern	LADY FERN
BERTHU	0	BERBERIS THUNBERGII	4	FACU-	Ad Shrub	JAPANESE BARBERRY
CXALBU	5	Carex albursina	5	UPL	Nt P-Sedge	SEDGE
CXBLAN	1	Carex blanda	0	FAC	Nt P-Sedge	SEDGE
CXGRIS	3	Carex grisea	-3	FACW	Nt P-Sedge	SEDGE
CXHIRI	5	Carex hirtifolia	5	UPL	Nt P-Sedge	SEDGE
CXHITC	5	Carex hitchcockiana	5	UPL	Nt P-Sedge	SEDGE
CXJAME	8	Carex jamesii	5	UPL	Nt P-Sedge	JAMES' SEDGE
CXLEPO	3	Carex leptonervia	0	FAC	Nt P-Sedge	SEDGE
CXOLIC	8	Carex oligocarpa	5	UPL	Nt P-Sedge	SEDGE
CXRADI	2	Carex radiata	1	FAC-	Nt P-Sedge	STRAIGHT STYLED WOOD SEDGE
CXROSE	2	Carex rosea	5	UPL	Nt P-Sedge	CURLY STYLED WOOD SEDGE
CARCAO	6	Carpinus caroliniana	0	FAC	Nt Tree	BLUE BEECH
CARCOR	5	Carya cordiformis	0	FAC	Nt Tree	BITTERNUT HICKORY
CAUTHA	5	Caulophyllum thalictroides	5	UPL	Nt P-Forb	BLUE COHOSH
CELSCA	3	Celastrus scandens	3	FACU	Nt W-Vine	AMERICAN BITTERSWEET
CELOCC	5	Celtis occidentalis	1	FAC-	Nt Tree	HACKBERRY
CIRLUT	2	Circaea lutetiana	3	FACU	Nt P-Forb	ENCHANTER'S NIGHTSHADE
CORALT	5	Cornus alternifolia	5	UPL	Nt Tree	ALTERNATE LEAVED DOGWOOD
DENLAC	5	Dentaria laciniata	3	FACU	Nt P-Forb	CUT LEAVED TOOTHWORT
EUOATR	8	Euonymus atropurpurea	1	FAC-	Nt Shrub	WAHOO; BURNING BUSH
EUOOBO	5	Euonymus obovata	5	UPL	Nt Shrub	RUNNING STRAWBERRY BUSH
FAGGRA	6	Fagus grandifolia	3	FACU	Nt Tree	AMERICAN BEECH
FESSUB	5	Festuca subverticillata	2	FACU+	Nt P-Grass	NODDING FESCUE
FRAAME	5	Fraxinus americana	3	FACU	Nt Tree	WHITE ASH
FRAPEN	2	Fraxinus pennsylvanica	-3	FACW	Nt Tree	RED ASH
FRAQUA	8	Fraxinus quadrangulata	5	UPL	Nt Tree	BLUE ASH
GALAPA	0	Galium aparine	3	FACU	Nt A-Forb	ANNUAL BEDSTRAW
GALTRR	4	Galium triflorum	2	FACU+	Nt P-Forb	FRAGRANT BEDSTRAW
GEUCAN	1	Geum canadense	0	FAC	Nt P-Forb	WHITE AVENS
GEUVER	6	Geum vernum	1	FAC-	Nt P-Forb	SPRING AVENS
GLYSTR	4	Glyceria striata	-5	OBL	Nt P-Grass	FOWL MANNA GRASS
HACVIR	1	Hackelia virginiana	1	FAC-	Nt P-Forb	BEGGAR'S LICE
HEPACU	8	Hepatica acutiloba	5	UPL	Nt P-Forb	SHARP LOBED HEPATICA
HYDCAE	7	Hydrophyllum canadense	-2	FACW-	Nt P-Forb	CANADA WATERLEAF

HYDVIR	4	Hydrophyllum virginianum	-2	FACW-	Nt	P-Forb	VIRGINIA WATERLEAF
HYPPUN	4	Hypericum punctatum	-1	FAC+	Nt	P-Forb	SPOTTED ST. JOHN'S WORT
HYSPAT	5	Hystrix patula	5	UPL	Nt	P-Grass	BOTTLEBRUSH GRASS
IMPCAP	2	Impatiens capensis	-3	FACW	Nt	A-Forb	SPOTTED TOUCH ME NOT
IMPPAL	6	Impatiens pallida	-3	FACW	Nt	A-Forb	PALE TOUCH ME NOT
ISOBIT	8	Isopyrum biternatum	0	FAC	Nt	P-Forb	FALSE RUE ANEMONE
JUNTEN	1	Juncus tenuis	0	FAC	Nt	P-Forb	PATH RUSH
LAPCAN	4	Laportea canadensis	-3	FACW	Nt	P-Forb	WOOD NETTLE
LEEVIR	5	Leersia virginica	-3	FACW	Nt	P-Grass	WHITE GRASS
LIGVUL	0	LIGUSTRUM VULGARE	1	FAC-	Ad	Shrub	COMMON PRIVET
LINBEN	7	Lindera benzoin	-2	FACW-	Nt	Shrub	SPICEBUSH
LIRTUL	9	Liriodendron tulipifera	2	FACU+	Nt	Tree	TULIP TREE
LONBEL	0	LONICERA XBELLA	3	FACU	Ad	Shrub	HYBRID HONEYSUCKLE
MALCOR	4	Malus coronaria	5	UPL	Nt	Tree	AMERICAN CRAB
OSMCLI	4	Osmorhiza claytonii	4	FACU-	Nt	P-Forb	HAIRY SWEET CICELY
OXAFON	0	Oxalis fontana	3	FACU	Nt	P-Forb	YELLOW WOOD SORREL
PARQUI	5	Parthenocissus quinquefolia	1	FAC-	Nt	W-Vine	VIRGINIA CREEPER
PHYAME	2	Phytolacca americana	1	FAC-	Nt	P-Forb	POKEWEED
POASYL	8	Poa sylvestris	0	FAC	Nt	P-Grass	WOODLAND BLUEGRASS
PODPEL	3	Podophyllum peltatum	3	FACU	Nt	P-Forb	MAY APPLE
POLPUB	5	Polygonatum pubescens	5	UPL	Nt	P-Forb	DOWNY SOLOMON SEAL
POLVIM	4	Polygonum virginianum	0	FAC	Nt	P-Forb	JUMPSEED
POPDEL	1	Populus deltoides	-1	FAC+	Nt	Tree	COTTONWOOD
PREALB	5	Prenanthes alba	3	FACU	Nt	P-Forb	WHITE LETTUCE
PRUSER	2	Prunus serotina	3	FACU	Nt	Tree	WILD BLACK CHERRY
QUERUB	5	Quercus rubra	3	FACU	Nt	Tree	RED OAK
RANHIS	5	Ranunculus hispidus	0	FAC	Nt	P-Forb	SWAMP BUTTERCUP
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad	Shrub	MULTIFLORA ROSE
RUBALL	1	Rubus allegheniensis	2	FACU+	Nt	Shrub	COMMON BLACKBERRY
RUBOCC	1	Rubus occidentalis	5	UPL	Nt	Shrub	BLACK RASPBERRY
RUMOBT	0	RUMEX OBTUSIFOLIUS	-3	FACW	Ad	P-Forb	BITTER DOCK
SASALB	5	Sassafras albidum	3	FACU	Nt	Tree	SASSAFRAS
SCRMAR	5	Scrophularia marilandica	4	FACU-	Nt	P-Forb	LATE FIGWORT
SMIRAC	5	Smilacina racemosa	3	FACU	Nt	P-Forb	FALSE SPIKENARD
SMITAM	5	Smilax tamnoides	0	FAC	Nt	W-Vine	BRISTLY GREEN BRIER
STYDIP	10	Stylophorum diphyllum	5	UPL	Nt	P-Forb	WOOD POPPY
TILAME	5	Tilia americana	3	FACU	Nt	Tree	BASSWOOD
TOXRAR	2	Toxicodendron radicans	-1	FAC+	Nt	W-Vine	POISON IVY
TRIGRA	5	Trillium grandiflorum	5	UPL	Nt	P-Forb	COMMON TRILLIUM
ULMAME	1	Ulmus americana	-2	FACW-	Nt	Tree	AMERICAN ELM
ULMRUB	2	Ulmus rubra	0	FAC	Nt	Tree	SLIPPERY ELM
VERURT	4	Verbena urticifolia	-1	FAC+	Nt	P-Forb	WHITE VERVAIN
VIBOPO	0	VIBURNUM OPULUS	0	FAC	Ad	Shrub	EUROPEAN HIGHBUSH CRANBERRY
VIOSOR	1	Viola sororia	1	FAC-	Nt	P-Forb	COMMON BLUE VIOLET
VIOSTR	5	Viola striata	-3	FACW	Nt	P-Forb	CREAM VIOLET
VITRIP	3	Vitis riparia	-2	FACW-	Nt	W-Vine	RIVERBANK GRAPE

A significant portion of the site has been either in tillage agriculture or intense pasture use. Most of these **Eurasian Meadow** units are now dominated by Eurasian meadow species. Such areas and the ambient, heavily pastured wooded districts ambient to them would be ideal areas in which to nestle a neighborhood. The wooded district north of U.S. 20, along the south side of Prairie Avenue, is currently wooded, but since it has been intensely tilled or pasture, the woods are not of remnant quality.

FLORISTIC QUALITY DATA	Native	31	50.0%	Adventive	31	50.0%
31 NATIVE SPECIES	Tree	4	6.5%	Tree	1	1.6%
62 Total Species	Shrub	4	6.5%	Shrub	3	4.8%
2.0 NATIVE MEAN C	W-Vine	3	4.8%	W-Vine	0	0.0%
1.0 W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
11.3 NATIVE FQI	P-Forb	10	16.1%	P-Forb	13	21.0%
8.0 W/Adventives	B-Forb	3	4.8%	B-Forb	4	6.5%
0.9 NATIVE MEAN W	A-Forb	4	6.5%	A-Forb	5	8.1%
1.8 W/Adventives	P-Grass	1	1.6%	P-Grass	5	8.1%
AVG: Faculative (-)	A-Grass	0	0.0%	A-Grass	0	0.0%
	P-Sedge	2	3.2%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Fern	0	0.0%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACENEG	0	Acer negundo	-2	FACW-	Nt Tree	BOX ELDER
AGRGIG	0	AGROSTIS GIGANTEA	0	FAC	Ad P-Grass	REDTOP
ALLPET	0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
AMBART	0	Ambrosia artemisiifolia	3	FACU	Nt A-Forb	COMMON RAGWEED
AMBTRI	0	Ambrosia trifida	-1	FAC+	Nt A-Forb	GIANT RAGWEED
ARATHA	0	ARABIDOPSIS THALIANA	5	UPL	Ad A-Forb	MOUSE EAR CRESS
ARCMIN	0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
ASCSYR	1	Asclepias syriaca	5	UPL	Nt P-Forb	COMMON MILKWEED
ASTPIL	1	Aster pilosus	2	FACU+	Nt P-Forb	HAIRY ASTER
BARVUL	0	BARBAREA VULGARIS	0	FAC	Ad B-Forb	YELLOW ROCKET
BROINE	0	BROMUS INERMIS	5	UPL	Ad P-Grass	SMOOTH BROME
CARPAR	10	Cardamine parviflora	0	FAC	Nt A-Forb	DRYLAND BITTER CRESS

CXBLAN	1	Carex blanda	0	FAC	Nt	P-Sedge	SEDGE
CXCEPP	3	Carex cephalophora	3	FACU	Nt	P-Sedge	SEDGE
CERFON	0	CERASTIUM FONTANUM	3	FACU	Ad	P-Forb	MOUSE EAR CHICKWEED
CHEALB	0	CHENOPODIUM ALBUM	1	FAC-	Ad	A-Forb	LAMB'S QUARTERS
CHRLEU	0	CHRYSANTHEMUM LEUCANTHEMUM	5	UPL	Ad	P-Forb	OX EYE DAISY
CIRDIS	4	Cirsium discolor	5	UPL	Nt	B-Forb	PASTURE THISTLE
CLEVIR	4	Clematis virginiana	0	FAC	Nt	W-Vine	VIRGIN'S BOWER
CORFOE	1	Cornus foemina	-2	FACW-	Nt	Shrub	GRAY DOGWOOD
DACGLO	0	DACTYLIS GLOMERATA	3	FACU	Ad	P-Grass	ORCHARD GRASS
DAUCAR	0	DAUCUS CAROTA	5	UPL	Ad	B-Forb	QUEEN ANNE'S LACE
DUCIND	0	DUCHESNEA INDICA	4	FACU-	Ad	P-Forb	INDIAN STRAWBERRY
ELAUMB	0	ELAEAGNUS UMBELLATA	3	FACU	Ad	Shrub	AUTUMN OLIVE
ERIANN	0	Erigeron annuus	1	FAC-	Nt	B-Forb	ANNUAL FLEABANE
FESARU	0	FESTUCA ARUNDINACEA	2	FACU+	Ad	P-Grass	TALL FESCUE
FRAPEN	2	Fraxinus pennsylvanica	-3	FACW	Nt	Tree	RED ASH
GEUCAN	1	Geum canadense	0	FAC	Nt	P-Forb	WHITE AVENS
GEUVER	6	Geum vernum	1	FAC-	Nt	P-Forb	SPRING AVENS
HACVIR	1	Hackelia virginiana	1	FAC-	Nt	P-Forb	BEGGAR'S LICE
HIECAE	0	HIERACIUM CAESPITOSUM	5	UPL	Ad	P-Forb	KING DEVIL
HYPRAD	0	HYPOCHAERIS RADICATA	5	UPL	Ad	P-Forb	SPOTTED CAT'S EAR
JUNTEN	1	Juncus tenuis	0	FAC	Nt	P-Forb	PATH RUSH
LIGVUL	0	LIGUSTRUM VULGARE	1	FAC-	Ad	Shrub	COMMON PRIVET
MORALB	0	MORUS ALBA	0	FAC	Ad	Tree	WHITE MULBERRY
OENBIE	2	Oenothera biennis	3	FACU	Nt	B-Forb	COMMON EVENING PRIMROSE
PARQUI	5	Parthenocissus quinquefolia	1	FAC-	Nt	W-Vine	VIRGINIA CREEPER
PHAARU	0	Phalaris arundinacea	-4	FACW+	Nt	P-Grass	REED CANARY GRASS
PLALAN	0	PLANTAGO LANCEOLATA	0	FAC	Ad	P-Forb	ENGLISH PLANTAIN
POAPRA	0	POA PRATENSIS	1	FAC-	Ad	P-Grass	KENTUCKY BLUEGRASS
POTREC	0	POTENTILLA RECTA	5	UPL	Ad	P-Forb	ROUGH FRUITED CINQUEFOIL
PRUSER	2	Prunus serotina	3	FACU	Nt	Tree	WILD BLACK CHERRY
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad	Shrub	MULTIFLORA ROSE
RUBALL	1	Rubus allegheniensis	2	FACU+	Nt	Shrub	COMMON BLACKBERRY
RUBFLA	1	Rubus flagellaris	4	FACU-	Nt	Shrub	NORTHERN DEWBERRY
RUBOCC	1	Rubus occidentalis	5	UPL	Nt	Shrub	BLACK RASPBERRY
RUMACL	0	RUMEX ACETOSELLA	0	FAC	Ad	P-Forb	SHEEP SORREL
RUMOBT	0	RUMEX OBTUSIFOLIUS	-3	FACW	Ad	P-Forb	BITTER DOCK
SASALB	5	Sassafras albidum	3	FACU	Nt	Tree	SASSAFRAS
SILPRA	0	SILENE PRATENSIS	5	UPL	Ad	A-Forb	WHITE CATCHFLY
SOLALT	1	Solidago altissima	3	FACU	Nt	P-Forb	TALL GOLDENROD
SOLCAN	1	Solidago canadensis	3	FACU	Nt	P-Forb	CANADA GOLDENROD
TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad	P-Forb	COMMON DANDELION
TRICAM	0	TRIFOLIUM CAMPESTRE	5	UPL	Ad	A-Forb	LOW HOP CLOVER
TRIHYB	0	TRIFOLIUM HYBRIDUM	1	FAC-	Ad	P-Forb	ALSIKE CLOVER
TRIPRA	0	TRIFOLIUM PRATENSE	2	FACU+	Ad	P-Forb	RED CLOVER
TRIREP	0	TRIFOLIUM REPENS	2	FACU+	Ad	P-Forb	WHITE CLOVER
URTDIO	1	Urtica dioica	-1	FAC+	Nt	P-Forb	NETTLE
VERURT	4	Verbena urticifolia	-1	FAC+	Nt	P-Forb	WHITE VERVAIN
VERARV	0	VERONICA ARVENSIS	5	UPL	Ad	A-Forb	CORN SPEEDWELL
VERPEG	0	Veronica peregrina	-4	FACW+	Nt	A-Forb	PURSLANE SPEEDWELL or NECKWEED
VITRIP	3	Vitis riparia	-2	FACW-	Nt	W-Vine	RIVERBANK GRAPE

Floristic Quality Data Summary **n =** Number of Native Species; **w =** Weeds; **Mean C =** Average Coefficient of Conservatism; **Index =** Floristic Quality Index				
Inventory Areas	**n**	**w**	**Mean C**	**Index**
Southeast Woods Unit	88	7	4.9	46
Southcentral Woods Unit	83	8	4.3	39
Woodlot Unit	42	8	4.2	27
Wet Mesic Unit	43	9	3.2	21
Southwest Woods Unit	28	5	3.9	20
Eurasian Meadows Unit	31	31	2.0	11
West Unit	121	46	3.7	40

Wherever the Floristic Quality Assessment system has been applied across the country, we have found that the Mean C values of most landscapes range from 0, in lawns, to 2 in most Eurasian meadows. In light of the fact that about 90% of our native flora has a C value of 4 or greater, it is evident that the principal elements of our native systems are virtually uninvolved in our landscapes today---which circumstance excludes most of our native insects as well.

The great preponderance of our landscapes today register Floristic Quality Index values less than 20 and essentially have no significance from a natural area perspective. Areas with I values higher than 35 possess sufficient conservatism and richness to be of profound importance state-wide perspective. Areas that register in the 50's and higher are extremely rare and of paramount significance; for most states, such areas represent less than 0.5% of the landscape today.

In well designed and implemented restorations, after five years of annual fire, one may expect the Mean C to range from 2.5-3.9, with index values as high as 35. Obviously restorations can renew our landscape to beauty and diversity far higher than the great proportion of our landscape, but they cannot replace and aboriginal remnant.

Here at the South Bend site, both the Southeast and Southcentral Woods are quite high in quality, but on the decline do to chronic fire suppression and overtaking by trees and invasive non-native shrubs. Annual fire in all of the systems with Index values of 20 or higher can be maintained or will set out on a trajectory of improvement and optimum biodiversity if a regular controlled burn were implemented. If fire is withheld, their quality and beauty will continue to dissipate over time.

Sincerely,
Conservation Design Forum

Appendix D
Elkhart Floristic Quality Assessment

Conservation Design Forum
Ecological Design Services • Landscape Architecture • Planning • Civil / Water Resources Engineering
Sustainable Urbanism • Ecosystem Sciences

DRAFT

Vegetation Memorandum for Record

Date:	November 19, 2012
To:	Amy Krebs, ATKINS
From:	Gerould Wilhelm/Patrick Judd
Re:	Vegetation Assessment: Floristic Quality Assessment, Parcel 63 & 64, Fall 2012
cc:	
Ref. #:	12034.00 Pokagon NEPA

Memo

On August 22, 2012, I surveyed Parcel 63 & 64, which lies south of Co. Rd 26, east of Nappanee St., in Elkhart, Indiana. With the exceptions of an old 1.8-acre home site ¼ mile south of Co. Rd, off of Nappanee St. and a substation nearly ½ mile east of the same home-site, also ¼ mile south of Co. Rd. 26, the entire parcel, as well as Parcel 64, is in row-crop agriculture.

The data presented below are from the old home site, inventoried from a wooded fence row and driveway to a defunct residence in the southwest corner of the parcel. The mean C of 2.3 is as high as it is only because there are 3 native trees along the north fence line, with few other native species. There is little or no vegetative infrastructure likely to provide habitat for listed organisms, nor is there any jurisdictional wetland I'm aware of.

FLORISTIC QUALITY DATA	Native	13	44.8%	Adventive	16	55.2%
13 NATIVE SPECIES	Tree	3	10.3%	Tree	4	13.8%
29 Total Species	Shrub	1	3.4%	Shrub	0	0.0%
2.3 NATIVE MEAN C	W-Vine	4	13.8%	W-Vine	0	0.0%
1.0 W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
8.3 NATIVE FQI	P-Forb	1	3.4%	P-Forb	3	10.3%
5.6 W/Adventives	B-Forb	2	6.9%	B-Forb	2	6.9%
1.9 NATIVE MEAN W	A-Forb	2	6.9%	A-Forb	3	10.3%
2.3 W/Adventives	P-Grass	0	0.0%	P-Grass	3	10.3%
AVG: Fac. Upland (+)	A-Grass	0	0.0%	A-Grass	1	3.4%
	P-Sedge	0	0.0%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Fern	0	0.0%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACEPLA	0	ACER PLATANOIDES	5	UPL	Ad Tree	NORWAY MAPLE
AMBTRI	0	Ambrosia trifida	-1	FAC+	Nt A-Forb	GIANT RAGWEED
ARCMIN	0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
ATRPAT	0	ATRIPLEX PATULA	-2	FACW-	Ad A-Forb	SPEARSCALE
BROINE	0	BROMUS INERMIS	5	UPL	Ad P-Grass	SMOOTH BROME
CHEALB	0	CHENOPODIUM ALBUM	1	FAC-	Ad A-Forb	LAMB'S QUARTERS
CICINT	0	CICHORIUM INTYBUS	5	UPL	Ad P-Forb	CHICORY
DACGLO	0	DACTYLIS GLOMERATA	3	FACU	Ad P-Grass	ORCHARD GRASS
DAUCAR	0	DAUCUS CAROTA	5	UPL	Ad B-Forb	QUEEN ANNE'S LACE
ERIANN	0	Erigeron annuus	1	FAC-	Nt B-Forb	ANNUAL FLEABANE
JUGNIG	5	Juglans nigra	3	FACU	Nt Tree	BLACK WALNUT
LEPVIR	0	Lepidium virginicum	4	FACU-	Nt A-Forb	COMMON PEPPERGRASS
MORALB	0	MORUS ALBA	0	FAC	Ad Tree	WHITE MULBERRY

OENBIE	2	Oenothera biennis	3	FACU	Nt	B-Forb	COMMON EVENING PRIMROSE
PARINS	4	Parthenocissus inserta	3	FACU	Nt	W-Vine	THICKET CREEPER
PARQUI	5	Parthenocissus quinquefolia	1	FAC-	Nt	W-Vine	VIRGINIA CREEPER
PLALAN	0	PLANTAGO LANCEOLATA	0	FAC	Ad	P-Forb	ENGLISH PLANTAIN
POAANN	0	POA ANNUA	1	FAC-	Ad	A-Grass	ANNUAL BLUEGRASS
POAPRA	0	POA PRATENSIS	1	FAC-	Ad	P-Grass	KENTUCKY BLUEGRASS
POLAVI	0	POLYGONUM AVICULARE	1	FAC-	Ad	A-Forb	KNOTWEED
PRUSER	2	Prunus serotina	3	FACU	Nt	Tree	WILD BLACK CHERRY
QUERUB	5	Quercus rubra	3	FACU	Nt	Tree	RED OAK
RHACAT	0	RHAMNUS CATHARTICA	3	FACU	Ad	Tree	COMMON BUCKTHORN
RUBOCC	1	Rubus occidentalis	5	UPL	Nt	Shrub	BLACK RASPBERRY
SOLALT	1	Solidago altissima	3	FACU	Nt	P-Forb	TALL GOLDENROD
TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad	P-Forb	COMMON DANDELION
TOXRAR	2	Toxicodendron radicans	-1	FAC+	Nt	W-Vine	POISON IVY
ULMPUM	0	ULMUS PUMILA	5	UPL	Ad	Tree	SIBERIAN ELM
VITRIP	3	Vitis riparia	-2	FACW-	Nt	W-Vine	RIVERBANK GRAPE

Sincerely,
Conservation Design Forum

Appendix D

IDNR Determination Letter

Indiana Department of Natural Resources

Mitchell E. Daniels, Jr., Governor
Robert E. Carter, Jr., Director

Division of Nature Preserves
402 W. Washington St., Rm W267
Indianapolis, IN 46204-2739

November 19, 2012

Woody L. Held
King & MacGregor Environmental, Inc.
43050 Ford Road, Suite 130
Canton, MI 48187

Dear Woody Held:

I am responding to your request for information on the endangered, threatened, or rare (ETR) species, high quality natural communities, and natural areas documented from the Pokagon Tribe sites, St. Joseph and Elkhart Counties, Indiana. The Indiana Natural Heritage Data Center has been checked and following you will find information on the ETR species documented within 0.5 mile of the project area.

For more information on the animal species mentioned, please contact Christie Stanifer, Environmental Coordinator, Division of Fish and Wildlife, 402 W. Washington Room W273, Indianapolis, Indiana 46204, (317)232-8163.

The information I am providing does not preclude the requirement for further consultation with the U.S. Fish and Wildlife Service as required under Section 7 of the Endangered Species Act of 1973. If you have concerns about potential Endangered Species Act issues you should contact the Service at their Bloomington, Indiana office.

U.S. Fish and Wildlife Service
620 South Walker St.
Bloomington, Indiana 47403-2121
812-334-4261

At some point, you may need to contact the Department of Natural Resources' Environmental Review Coordinator so that other divisions within the department have the opportunity to review your proposal.

An Equal Opportunity Employer

For more information, please contact:

Department of Natural Resources
attn: Christie Stanifer
Environmental Coordinator
Division of Fish and Wildlife
402 W. Washington Street, Room W273
Indianapolis, IN 46204
(317)232-8163

Please note that the Indiana Natural Heritage Data Center relies on the observations of many individuals for our data. In most cases, the information is not the result of comprehensive field surveys conducted at particular sites. Therefore, our statement that there are no documented significant natural features at a site should not be interpreted to mean that the site does not support special plants or animals.

Due to the dynamic nature and sensitivity of the data, this information should not be used for any project other than that for which it was originally intended. It may be necessary for you to request updated material from us in order to base your planning decisions on the most current information.

Thank you for contacting the Indiana Natural Heritage Data Center. You may reach me at (317)232-8059 if you have any questions or need additional information.

Sincerely,

Ronald P. Hellmich

Ronald P. Hellmich
Indiana Natural Heritage Data Center

Enclosure: Data sheets

Endangered, Threatened and Rare Species Documented From the Pokagon Sites Project Areas, St. Joseph and Elkhart Counties, Indiana

Type	Species Name	Common Name	Fed	State	Town Range	Date	Comments
Bird	Botaurus lentiginosus	American Bittern		SE	037N002E 06	1991-04-09	
Bird	Lanius ludovicianus	Loggerhead Shrike		SE	037N002E 35 NWQ	2002-08-02	
High Quality Natural Community	Forest - floodplain wet-mesic	Wet-mesic Floodplain Forest		SG	037N004E 16 EH	1986-06-17	
High Quality Natural Community	Forest - floodplain wet-mesic	Wet-mesic Floodplain Forest		SG	037N004E 16 EH & NEQ NEQ NWQ	1986-06-17	
High Quality Natural Community	Forest - upland mesic	Mesic Upland Forest		SG	036N004E 15 NEQ	1985-07	
Mammal	Condylura cristata	Star-nosed Mole		SSC	036N005E 12	1971-06	
Mammal	Condylura cristata	Star-nosed Mole		SSC	037N005E 25 SWQ	1991-06-13	
Mammal	Taxidea taxus	American Badger		SSC	037N005E 27	2002-07	
Reptile	Emydoidea blandingii	Blanding's Turtle		SE	036N002E 03	1983-08-16	
Reptile	Emydoidea blandingii	Blanding's Turtle		SE	038N002E 36	1997-08-13	
Reptile	Nerodia erythrogaster neglecta	Copperbelly Water Snake	PS:LT	SE	037N003E 06 SWQ SWQ NWQ	1965-06-17	MUSEUM

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State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SG = state significant; WL = Watch List; no rank - not ranked but tracked to monitor status

Type	Species Name	Common Name	Fed	State	Town Range	Date	Comments
Vascular Plant	Actaea rubra	Red Baneberry		SR	037N003E 32	1924-05-24	
Vascular Plant	Arabis drummondii	Drummond Rockcress		SE	037N002E 30	1930-06	
Vascular Plant	Arabis glabra	Tower-mustard		WL	037N004E 21 NWQ NWQ NWQ	1992-06-09	
Vascular Plant	Arenaria stricta	Michaux's Stitchwort		SR	037N004E 02	1945-06-17	
Vascular Plant	Carex straminea	Straw Sedge		ST	037N004E 4 MI SE OF MISHAWAKA.	1922-06-07	
Vascular Plant	Cypripedium candidum	Small White Lady's-slipper		WL	037N002E 30 SWQ	1979-08-15	
Vascular Plant	Eriophorum angustifolium	Narrow-leaved Cotton-grass		SR	037N002E 30	1934-06	
Vascular Plant	Linum sulcatum	Grooved Yellow Flax		SR	037N004E 09 NEQ	1935-09-29	
Vascular Plant	Lycopodium obscurum	Tree Clubmoss		SR	037N002E 05 SWQ NEQ SWQ	1991-04-09	
Vascular Plant	Milium effusum	Tall Millet-grass		SR	037N004E 34	1929-05-28	
Vascular Plant	Panicum verrucosum	Warty Panic-grass		ST	037N002E 07 NEQ SWQ NWQ	1993-09-04	
Vascular Plant	Panicum verrucosum	Warty Panic-grass		ST	037N002E 05 SWQ NEQ SWQ	1991-09-21	
Vascular Plant	Poa paludigena	Bog Bluegrass		WL	037N002E 30 W HALF SWQ	1946-06-13	
Vascular Plant	Rubus enslenii	Southern Dewberry		SE	037N002E 05 NEQ NWQ SWQ	1992-08-07	

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State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SG = state significant; WL = Watch List; no rank - not ranked but tracked to monitor status

Type	Species Name	Common Name	Fed	State	Town Range	Date	Comments
Vascular Plant	Stipa avenacea	Blackseed Needlegrass		SR	037N002E 06 NEQ SEQ NWQ	1990-07-07	
Vascular Plant	Triglochin palustris	Marsh Arrow-grass		SR	037N002E 30	1950-06	
Vascular Plant	Vaccinium oxycoccos	Small Cranberry		ST	037N002E 30	1940-07	
Vascular Plant	Valerianella chenopodiifolia	Goose-foot Corn-salad		SE	037N004E 09	1987-04	
AUTEN DITCH							
Mollusk Gastropod	Lymnaea stagnalis	Swamp Lymnaea		SSC	037N002E 27 SWQ SWQ SEQ	1988-06-02	
BAUGO CREEK							
Fish	Rhinichthys cataractae	Longnose Dace		SSC	036N004E 23	2008-SUMMER	
Fish	Rhinichthys cataractae	Longnose Dace		SSC	037N004E 26	2008-SUMMER	
Mollusk	Venustaconcha ellipsiformis	Ellipse		SSC	036N004E 10	2005-06-21	LIVE
BENDIX PARK							
Vascular Plant	Lathyrus venosus	Smooth Veiny Pea		ST	037N002E 03	1929-06-13	
ELKHART CONSERVATION CLUB							
Reptile	Emydoidea blandingii	Blanding's Turtle		SE	037N004E 03 SWQ NEQ NEQ	1994-06-05	

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Type	Species Name	Common Name	Fed	State	Town Range	Date	Comments
ELKHART RIVER							
Fish	Moxostoma valenciennesi	Greater Redhorse		SE	037N005E 24	2010-08-05	
Mollusk	Venustaconcha ellipsiformis	Ellipse		SSC	037N005E 25	2005-06-21	FRESH DEAD
Mollusk	Venustaconcha ellipsiformis	Ellipse		SSC	037N005E 4	2004-10-12	FRESH DEAD
NEWCOMER DITCH							
Mollusk Gastropod	Lymnaea stagnalis	Swamp Lymnaea		SSC	036N004E 31 NWQ NEQ NEQ	1988-05-31	
RUM VILLAGE PARK							
Bird	Mniotilta varia	Black-and-white Warbler		SSC	037N002E 23 WH	1993-05-25	
High Quality Natural Community	Forest - upland dry-mesic	Dry-mesic Upland Forest		SG	037N002E 23 SH NWQ	1987-06-17	
RUPEL FARM							
Vascular Plant	Deschampsia cespitosa	Tufted Hairgrass		SR	037N001E 36	1937-06	
Vascular Plant	Sorbus decora	Northern Mountain-ash		SX	037N001E 36	1933-10	
SOUTH BEND CITY COUNTY TOWER BUILDING							
Bird	Falco peregrinus	Peregrine Falcon		SE	037N002E 12	2011-06-13	NEST SITE

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Type	Species Name	Common Name	Fed	State	Town Range	Date	Comments
ST JOSEPH RIVER							
Fish	Moxostoma valenciennesi	Greater Redhorse		SE	037N005E 6	2010-07-21	
Mollusk	Venustaconcha ellipsiformis	Ellipse		SSC	037N005E 5	2004-10-12	WEATHERED DEAD
ST. JOSEPH RIVER							
Fish	Moxostoma valenciennesi	Greater Redhorse		SE	037N002E 12	2008-07-30	
STUDEBAKER'S WOODS (RUM VILLAGE PARK)							
Vascular Plant	Geranium robertianum	Herb-robert		ST	037N002E 23 SWQ NWQ	1912-06	
WAKARUSA ROOKERY							
Bird	Ardea herodias	Great Blue Heron			036N004E 15 SWQ NEQ	1993-05-03	
WOLVERTON ESTATE							
Vascular Plant	Deschampsia cespitosa	Tufted Hairgrass		SR	037N002E 30	1946-06	
WOOLVERTON ESTATE							
Vascular Plant	Carex flava	Yellow Sedge		ST	037N002E 30	1979-08-15	
Vascular Plant	Utricularia cornuta	Horned Bladderwort		ST	037N002E 30	1934-07	
WOOLVERTON ESTATE (DESTROYED)							

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Type	Species Name	Common Name	Fed	State	Town Range	Date	Comments
Vascular Plant	Platanthera dilatata	Leafy White Orchis		SE	037N002E 30	1946-06-13	
YELLOW CREEK							
Fish	Rhinichthys cataractae	Longnose Dace		SSC	037N005E 21	2008-SUMMER	
YELLOW RIVER							
Mollusk	Venustaconcha ellipsiformis	Ellipse		SSC	037N005E 22	2003-08-01	WEATHERED DEAD

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Vascular Plant	Cypripedium candidum	Small White Lady's-slipper		WL	037N002E 30 SWQ	1979-08-15	
Vascular Plant	Eriophorum angustifolium	Narrow-leaved Cotton-grass		SR	037N002E 30	1934-06	
Vascular Plant	Linum sulcatum	Grooved Yellow Flax		SR	037N004E 09 NEQ	1935-09-29	
Vascular Plant	Lycopodium obscurum	Tree Clubmoss		SR	037N002E 05 SWQ NEQ SWQ	1991-04-09	
Vascular Plant	Milium effusum	Tall Millet-grass		SR	037N004E 34	1929-05-28	
Vascular Plant	Panicum verrucosum	Warty Panic-grass		ST	037N002E 07 NEQ SWQ NWQ	1993-09-04	
Vascular Plant	Panicum verrucosum	Warty Panic-grass		ST	037N002E 05 SWQ NEQ SWQ	1991-09-21	
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AUTEN DITCH							
Mollusk Gastropod	Lymnaea stagnalis	Swamp Lymnaea		SSC	037N002E 27 SWQ SWQ SEQ	1988-06-02	
BAUGO CREEK							
Fish	Rhinichthys cataractae	Longnose Dace		SSC	036N004E 23	2008-SUMMER	
Fish	Rhinichthys cataractae	Longnose Dace		SSC	037N004E 26	2008-SUMMER	
Mollusk	Venustaconcha ellipsiformis	Ellipse		SSC	036N004E 10	2005-06-21	LIVE
BENDIX PARK							
Vascular Plant	Lathyrus venosus	Smooth Veiny Pea		ST	037N002E 03	1929-06-13	
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ST. JOSEPH RIVER							
Fish	Moxostoma valenciennesi	Greater Redhorse		SE	037N002E 12	2008-07-30	
STUDEBAKER'S WOODS (RUM VILLAGE PARK)							
Vascular Plant	Geranium robertianum	Herb-robert		ST	037N002E 23 SWQ NWQ	1912-06	
WAKARUSA ROOKERY							
Bird	Ardea herodias	Great Blue Heron			036N004E 15 SWQ NEQ	1993-05-03	
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YELLOW RIVER							
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Division of Nature Preserves
402 W. Washington St., Rm W267
Indianapolis, IN 46204-2739

January 26, 2016

Kirsten Williams
QPS Engineering, LLC
2000 Cliff Mine Road, Suite 420
Pittsburgh, PA 15275

Dear Kirsten Williams:

I am responding to your request for information on the endangered, threatened, or rare (ETR) species, high quality natural communities, and natural areas documented from a project area, Tribal Village and Casino City, South Bend, Indiana. The Indiana Natural Heritage Data Center has been checked and there are no *Myotis septentrionalis* occurrences documented near this project area. Also, there are no ETR species and significant areas documented within 0.5 mile of the project area.

The information I am providing does not preclude the requirement for further consultation with the U.S. Fish and Wildlife Service as required under Section 7 of the Endangered Species Act of 1973. If you have concerns about potential Endangered Species Act issues you should contact the Service at their Bloomington, Indiana office.

U.S. Fish and Wildlife Service
620 South Walker St.
Bloomington, Indiana 47403-2121
(812)334-4261

At some point, you may need to contact the Department of Natural Resources' Environmental Review Coordinator so that other divisions within the department have the opportunity to review your proposal. For more information, please contact:

Department of Natural Resources
attn: Christie Stanifer
Environmental Coordinator
Division of Fish and Wildlife
402 W. Washington Street, Room W273
Indianapolis, IN 46204
(317)232-8163

Please note that the Indiana Natural Heritage Data Center relies on the observations of many individuals for our data. In most cases, the information is not the result of comprehensive field surveys conducted at particular sites. Therefore, our statement that there are no documented significant natural features at a site should not be interpreted to mean that the site does not support special plants or animals.

Due to the dynamic nature and sensitivity of the data, this information should not be used for any project other than that for which it was originally intended. It may be necessary for you to request updated material from us in order to base your planning decisions on the most current information.

Thank you for contacting the Indiana Natural Heritage Data Center. You may reach me at (317)232-8059 you have any questions or need additional information.

Sincerely,

Ronald P. Hellmich

Ronald P. Hellmich
Indiana Natural Heritage Data Center

Appendix D

USACE and IDEM Meeting Notes

Meeting notes

Project:	Pokagon South Bend EIS		
Subject:	Wetland jurisdiction and permitting		
Date and time:	29 Jan 2013 - 11:00		
Meeting place:	USACE South Bend office	**Minutes by:**	Amy Krebs

Present/Representing:

Amy Krebs	Atkins
Woody Held	King and MacGregor
Aaron Damrill	USACE
Matt Smedley	IDEM
Kerrie Kuhne	USACE
Scott Doig	BIA

Meeting Summary

The purpose of this meeting was to initiate a dialog with the USACE and IDEM regarding the wetlands on the S. Bend and Elkhart properties and the potential impacts to these systems by the proposed site development. The meeting began by looking at the S. Bend wetlands.

- The project manager for the USACE will be Kerrie Kuhne from Detroit but the field work would be done from the South Bend office.
- The USACE cannot definitely say which wetlands they would consider jurisdictional but they believe wetlands A &B would be considered jurisdictional. A jurisdictional determination would have to be done during the growing season (late March to early November) and would take approximately four months to complete.
- IDEM is not sure if they have jurisdiction over Federal Trust Lands. Matt will discuss this with his superiors. This may be the first case where IDEM is asked to make this determination for Indian Federal Trust Lands.
- The EPA coordinator for tribal lands in Chicago would issue the Section 401 permit if IDEM does not have jurisdiction.
- USACE outlined a procedure where the applicant can request that the USACE determine all wetlands on site to be jurisdictional. This is done to speed up the jurisdictional process In these situations, the USACE defers to IDEMS mitigation standards.
    - For a forested system, IDEM requires a 2.5 to 1 ratio onsite and a 4 to 1 ratio offsite.
- The existing wetland mitigation banks in the Kankakee watershed do not have the appropriate habitat credits available.
- USACE would prefer to see tribal lands utilized for mitigation. Suitability for the type of wetland mitigation required (forested) should be demonstrated.
- Aaron stated that other areas of concern on the site would be potential impacts to Indiana bat habitat and cultural resources.

  - This will be less of a concern during permitting because by that time the Section 7 and 106 concurrences will be complete.
- USACE stressed that during the permitting process it will be important to show how the development was designed to minimize impacts to wetlands and/or to justify why the development could not be altered to minimize wetland impacts.
- There is a regional permit that allows for up to 1 acre of impacts but cannot be utilized if IDEM is not involved in the permitting process.
- There is a nationwide permit that allows for up to ½ acre of impacts.
- Kerrie stated that she feels that this project would be permitted as an individual permit due to its controversial nature. Processing a permit application would take at least six months but likely closer to a year.
- The Elkhart site could potentially have more wetlands than have been previously identified. If it is shown that once the agricultural tiles are broken up the system could return to a functioning wetland then those wetlands would need to be mitigated for as well. There is no specific USACE guidance for this determination.
- USACE estimated approximately 3-4 months for a field determination of the wetlands and 6 months to a 1 year for the permitting process.

Appendix D

USFWS Determination Letter

United States Department of the Interior
Fish and Wildlife Service

Bloomington Field Office (ES)
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273

February 8, 2013

Mr. Scott Doig
Bureau of Indian Affairs
c/o Amy B. Krebs
ATKINS
3901 Calverton Boulevard
Calverton, Maryland 20705

Project: Pokagon Band of Potawatomi Indiana Tribal Village and Casino
Location: South Bend, St. Joseph County or Elkhart, Elkhart County

Dear Mr. Doig:

This responds to Ms. Kreb's emailed letter dated January 22, 2013, requesting our comments on the aforementioned project.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et. seq.) and are consistent with the intent of the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, and the U. S. Fish and Wildlife Service's Mitigation Policy.

The proposed project consists of the construction of a tribal village and casino project for the Pokagon Band at a site in St. Joseph County on the southwest side of South Bend or an Elkhart County site on the southwest side of Elkhart. The Elkhart site is about 200 acres of level row-crop farmland along SR 19 at CR 26, about 0.5 miles south of the US 20/St. Joseph Valley Parkway interchange with SR 19. There are no woodlands, wetlands, or other significant habitat types at this site.

The South Bend site is along SR 23/Prairie Avenue in the northeast quadrant of the interchange of that roadway with US 20/St. Joseph Valley Parkway. It consists of about 164 acres in an irregular triangular parcel bounded by the aforementioned highways and Locust Street, with a large apartment complex inholding to the north and a number of single-family residences along Locust Street. It supports a variety of woodlands, shrublands, old fields, fencerows, and

ponds/wetlands within rolling terrain. The woodlands are general mixed-age hardwoods, although there are scattered pines and other evergreens, primarily within former residential properties. The proposed development plan incorporates both the terrain and vegetation into the design, with most of the woodland left as community open space.

ENDANGERED SPECIES

The proposed project is within the range of the Federally endangered Indiana bat (Myotis sodalis), the threatened northern copperbelly water snake (Nerodia erythrogaster neglecta), and the candidate eastern massasauga rattlesnake (Sistrurus catenatus catenatus). However, there is no habitat available for any of these species within either of the proposed project areas, so we agree that the proposed project is not likely to adversely affect these endangered, threatened, and candidate species.

This precludes the need for further consultation on this project as required under Section 7 of the Endangered Species Act of 1973, as amended. However, should new information arise pertaining to project plans or a revised species list be published, it will be necessary for the Federal agency to reinitiate consultation.

We appreciate the opportunity to comment at this early stage of project planning. If you have any questions, please contact Elizabeth McCloskey at (219) 983-9753 or elizabeth_mccloskey@fws.gov.

Sincerely yours,

Elizabeth S. McCloskey

for Scott E. Pruitt
Supervisor

cc: Christie Stanifer, Environmental Coordinator, Division of Water, Indianapolis, IN

15 APR 20 AM 9:33

United States Department of the Interior
Fish and Wildlife Service

Bloomington Field Office (ES)
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273

April 16, 2015

Mr. Scott Doig
Regional Environmental Protection Specialist
Bureau of Indiana Affairs, Midwest Regional Office
5600 West American Boulevard, Suite 500
Bloomington, Minnesota 55437

RE: Draft Environmental Impact Statement for the Pokagon Band of Potawatomi Indians Fee-to-Trust Transfer for Tribal Village and Casino, City of South Bend, Indiana

Dear Mr. Doig:

The U.S. Fish and Wildlife Service (USFWS) has reviewed the subject document under our authorities and special expertise, including possible impacts on endangered species, migratory birds, and wetlands. We believe that the document adequately addresses the likely impacts of the preferred alternative, which is the conveyance into trust of ±165.81 acres of land in the City of South Bend, St. Joseph County, Indiana. The Pokagon Band already owns the land and proposes to develop a tribal village, multi-purpose facility, health services, other tribal government facilities, and a Class III gaming facility with hotel, meeting space, and parking. The DEIS also addresses the impacts of an alternative location for the facility at Elkhart, Elkhart County, and an alternative design at the South Bend site (tribal village with commercial development), as well as the No Action alternative.

Therefore, the USFWS has no comments on this Draft Environmental Impact Statement.

We appreciate the opportunity to review this document. For further discussion, please contact Elizabeth McCloskey at (219) 983-9753 or elizabeth_mccloskey@fws.gov.

Sincerely yours,

Elizabeth S. McCloskey
for Scott E. Pruitt
Supervisor

BUREAU OF INDIAN AFFAIRS
MIDWEST REGIONAL OFFICE
15 AUG 31 AM 8:32

United States Department of the Interior
Fish and Wildlife Service

Bloomington Field Office (ES)
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273

August 21, 2015

Ms. Diane K. Rosen
Regional Director
Bureau of Indian Affairs
Norman Pointe II Building, Suite 500
Bloomington, Minnesota 55427

Project: Proposed Pokagon Band Tribal Village Fee-to-Trust Acquisition and Casino Project
Location: South Bend, St. Joseph County, Indiana

Dear Ms. Rosen:

This responds to your letter dated July 22, 2015 concern the possibility of the threatened northern long-eared bat (Myotis septentrionalis) being present within the proposed project area. The U.S. Fish and Wildlife Service previously concurred that the endangered Indiana bat (Myotis sodalis), the threatened northern copperbelly water snake (Nerodia erythrogaster neglecta), and the candidate eastern massasauga rattlesnake (Sistrurus catenatus) are not known to be present and therefore are not likely to be adversely affected by the project (letter of February 8, 2013).

The northern long-eared bat was listed as threatened effective May 4; 2015. This species utilizes habitats that are very similar to those used by the Indiana bat, but it can utilize smaller/younger trees and woodlands with denser understories, is more likely to use cavities, and is known to utilize buildings and other human structures for roosting. We are not aware of any surveys for this or other bat species in the vicinity of the proposed project site, but a review of aerial photographs and the Draft Environmental Impact Statement's description of the available habitats indicate that suitable summer nursery habitat may be present for the northern long-eared bat. This species has been found in wooded habitats (*e.g.* forest preserves) within urban areas and where small woodlots are connected by fencerows.

We have enclosed information on conducting summer habitat assessments for Indiana and northern long-eared bats; the entire document is available on the U.S. Fish and Wildlife Service's Midwest Region website:
http://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2015IndianaBatSummerSurveyGuidelines01April2015.pdf

It is too late in the year to conduct presence/absence surveys for actual bats because they have already started migrating south to the caves where they overwinter. However, habitat assessments can be conducted at any time. These can be conducted within potential roosting and foraging habitat areas that would be cleared or otherwise altered by the proposed project in order to determine if summer nursery habitat may actually be present and, if so, how much of it would be affected by project development. This information may already be available if the winter 2013 site evaluation of potential Indiana bat habitat gathered sufficient information to also address potential northern long-eared bat habitat. If not, additional surveys are likely necessary. It is our understanding that the majority of the best potential habitats, which are hardwood woodlands along the south side of the property, would be left undeveloped, although a portion would be removed to construct the casino. We do not know if the areas shown on the DEIS site vegetation map (Figure 3.5-1) as Shrubs/Trees and Hedgerow provide potential foraging or roosting habitats for the northern long-eared bat.

If suitable habitat is determined to be present, acoustic surveys can be undertaken during the summer of 2016 (May 15 to August 15); protocols for these surveys are described in the Indiana Bat Summer Survey Guidelines. These Guidelines are regularly reviewed and any changes for 2016 will be posted on the FWS Midwest Region's website. If either the Indiana bat or northern long-eared bat is identified as likely being present by these acoustic surveys, mist net surveys would then be undertaken to attempt to catch a bat and install a radio transmitter in order to follow the bat to the roost(s). If no listed bats are found, no further consultation would be necessary, but if they are found formal consultation would proceed.

If the habitat assessment determines that only a small amount of potential habitat and/or a few potential bat roost trees would be removed during project development, these woodlots/fencerows/trees can be cut and removed during the time period when the bats would not be present, which is between October 1 and April 1. If the tree clearing cannot be completed during that time period, bat emergence surveys can be conducted at potential roost trees to determine whether or not they are actually being used by bats. If no bats emerge, the tree(s) should be removed as soon as possible (*e.g.* early the next morning).

When it is available, please provide us with the habitat assessment, including acres of impacts to potential roosting and foraging habitats, so we can evaluate the likelihood of adverse impacts and actions that can be taken to avoid such impacts. If you need additional information on how to proceed with Section 7 consultation for this proposed project, please contact Elizabeth McCloskey at (219) 983-9753 or elizabeth_mccloskey@fws.gov.

Sincerely yours,

Elizabeth S. McCloskey
for Scott E. Pruitt
Supervisor

2015
RANGE-WIDE INDIANA BAT SUMMER SURVEY GUIDELINES
April 2015

INTRODUCTION

The Indiana bat (*Myotis sodalis*) was originally listed as being in danger of extinction under the Endangered Species Preservation Act of 1966 (32 FR 4001, March 11, 1967), and is currently listed as endangered under the Endangered Species Act (ESA) of 1973, as amended. This survey protocol provides the U.S. Fish and Wildlife Service's (USFWS) recommended guidance on survey methodology and outlines additional reporting requirements for surveyors.

The following guidance is designed to determine whether Indiana bats are present[1] or likely absent at a given site during the summer (May 15 to August 15). The phased-approach, which includes coordination with the USFWS[2], habitat assessments, and acoustic, mist-net, radio-tracking, and emergence surveys, supersedes all prior summer survey guidance (including the 2007 and 2014 Indiana Bat Mist-Netting Guidelines). Future changes to this guidance may occur and will be posted on the USFWS Indiana bat survey guidance website (http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html). Please check this website to ensure use of the most current version of the guidance.

These protocols may be different from those designed for general bat monitoring as part of the North American Bat Monitoring Program (NABat). NABat surveys may be thought of as similar to breeding bird surveys and are not project-specific surveys in most cases. Information from NABat surveys can be considered as part of "best available" information when assessing whether there is already some existing information on presence of Indiana bats in the vicinity of a given project. We recommend following these guidelines for presence/probable absence surveys.

NOTE: These protocols can also be used for northern long-eared bat presence/probable absence surveys for the 2015 field season. The only difference is our definition of suitable summer habitat for northern long-eared bats.

OBJECTIVES

The objectives of Indiana bat summer survey guidelines are to (1) standardize range-wide survey procedures; (2) maximize the potential for detection/capture of Indiana bats at a minimum acceptable level of effort;(3) make accurate presence/absence determinations; and (4) aid in conservation efforts for the species by identifying areas where the species is present.

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[1] The guidance are not intended to be rigorous enough to provide sufficient data to fully determine population size or structure.

[2] Coordinate with the appropriate state natural resource agencies and any involved federal agency(ies) whenever "USFWS" coordination is listed. USFWS FO(s) may direct project sponsors to state agencies for existing occurrence information. Coordinate with your local USFWS FO(s) to understand the process for their area of jurisdiction.

APPENDIX A
PHASE 1 SUMMER HABITAT ASSESSMENTS

Summer habitat assessments are Step 2 of Phase 1- Initial Project Screening. The information below is provided to assist applicants, consultants, and/or project proponents (hereinafter termed the "applicant") in establishing whether summer surveys for Indiana bats should be conducted. As a reminder, the first step for determining presence of Indiana bats at a given site is to determine whether there is any existing occurrence data available for the vicinity of the project from the local USFWS FO. This step can be conducted remotely via a desktop analysis (e.g., use of aerial photography to assess the potential presence of suitable habitat). The applicant is responsible for developing and providing sufficient information as to whether potentially suitable summer Indiana bat habitat exists within a proposed project area. If suitable habitat is present, the applicant should calculate the amount and submit this to the USFWS FO(s) and determine the need for any presence/absence surveys (Phase 2). Note: if Indiana bats are present or assumed to be present during any phase, more detailed habitat information may be necessary to adequately assess the potential for impacts (see attached example Indiana Bat Habitat Assessment Datasheet). If no suitable habitat is present, no surveys are needed to assess risk during the summer. Habitat assessments for Indiana bats can be completed any time of year and applicants are encouraged to submit results and proposed Phase 2 study plans well in advance of the summer survey season.

PERSONNEL

Habitat assessments should be completed by individuals with a natural resource degree or equivalent work experience.

DEFINITION FOR POTENTIALLY SUITABLE INDIANA BAT SUMMER HABITAT

Suitable summer habitat for Indiana bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats[18] such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥5 inches dbh[19] (12.7 centimeter) that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other

[18] Non-forested habitats typically should be excluded from acreages used to establish a minimum level of survey effort for Phase 2 surveys.

[19] While trees <5 inches (<12.7 cm) dbh that have exfoliating bark, cracks, crevices, and/or hollows may have some potential to be male Indiana bat summer roosting habitat, the USFWS does not consider early-successional, even-aged stands of trees <5 inches dbh to be suitable roosting habitat for the purposes of this guidance. Suitable *roosting* habitat is defined as forest patches with trees of 5-inch (12.7 cm) dbh or larger. However, early successional habitat with small diameter trees may be used as foraging habitat by Indiana bats. Therefore, a project that would remove or otherwise adversely affect ≥20 acres of early successional habitat containing trees between 3 and 5 inches (7.6-12.7 cm) dbh would require coordination/consultation with the USFWS FO to ensure that associated impacts would not rise to the level of take. The USFWS may request P/A surveys if >20 acres of early successional habitat were proposed for removal.

forested/wooded habitat. We recommend that project proponents or their representatives coordinate with the appropriate USFWS Field Office to more clearly define suitable habitat for their particular region as some differences in state/regional suitability criteria may be warranted (e.g., high-elevation areas may be excluded as suitable habitat in some states).

DEFINITION FOR POTENTIALLY SUITABLE NORTHERN LONG-EARED BAT SUMMER HABITAT

Suitable summer habitat for NLEB consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1000 feet of other forested/wooded habitat[20]. NLEB has also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat[21]. NLEBs typically occupy their summer habitat from mid-May through mid-August each year[22] and the species may arrive or leave some time before or after this period.

SUBMISSION OF HABITAT ASSESSMENT AND PHASE 2 STUDY PLAN (IF NEEDED)

If a proposed project may affect (positively or negatively) Indiana bats and the conditions outlined in Step 3 a or b are not met, a habitat assessment report should be submitted to the appropriate USFWS FO(s) (and/or to the lead Federal Action Agency, such as the USACE, as appropriate) along with a draft study plan for the Phase 2 (acoustic or netting) survey (if suitable habitat is present). Complete reports will include the following:

1. Full names and relevant titles/qualifications of individuals (e.g., John E. Smith, Biologist II, State University, B.S. Wildlife Science 2007) completing the habitat assessment and when the assessment was conducted
2. A map and latitude/longitude or UTM clearly identifying the project location (or approximate center point) and boundaries
3. A detailed project description (if available)
4. Documentation of any known/occupied spring staging, summer, fall swarming, and/or winter habitat for Indiana bats within or near the project area

[20] This number is based on observations of bat behavior indicating that such an isolated tree (i.e., ≥1000 feet) would be extremely unlikely to be used as a roost. This distance has also been evaluated and vetted for use for the Indiana bat. See the "Indiana bat Section 7 and Section 10 Guidance for wind Energy Projects," question 33, found at: http://www.fws.gov/midwest/endangered/mammals/inba/WindEnergyGuidance.html

[21] Trees found in highly-developed urban areas (e.g., street trees, downtown areas) are extremely unlikely to be suitable NLEB habitat.

[22] Exact dates vary by location.

5. A description of methods used during the habitat assessment
6. A summary of the assessment findings and a completed Indiana Bat Habitat Assessment Datasheet (see attached below; use of this particular datasheet is optional)
7. Other information that may have a bearing on Indiana bat use of the project area (e.g., presence of fall or winter habitat [caves, crevices, fissures, or sinkholes, or abandoned mines of any kind], bridges and other non-tree potential summer roosts.)
8. Any other information requested by the local USFWS FO(s) related to the project

In addition, Phase 2 Study Plans should contain the following:

1. A statement as to which type of P/A surveys will be conducted (i.e., mist netting or acoustic surveys) and how the proposed survey level of effort (i.e., total # of net nights or detector nights) was calculated/determined;
2. A map depicting the proposed number of survey sites (mist netting or acoustic) and their tentative distribution throughout the project area;
3. A tentative list of surveyors names and copies of relevant federal permits (if required in the project State);
4. A tentative survey schedule (e.g., start date, duration, end date);
5. For mist netting surveys with planned Phase 4 radio-tracking – the approximate number and distribution of transmitters (e.g., prioritization of sex/age, maximum number per site) and a request that bats targeted for tracking may be held for up to 45 minutes[23] to allow for application of transmitters; and
6. For acoustic surveys - information on which specific program(s) will be used and what level of acoustic analyses will be conducted.

[23] Current standard federal Section 10 bat permit conditions require prior written approval from the Field Supervisor in the USFWS FO(s) if capture times may exceed 30 minutes.

APPENDIX E
PHASE 4 EMERGENCE SURVEYS

PERSONNEL

Qualified biologists[48], biological technicians, and any other individuals deemed qualified by a local USFWS FO may conduct emergence surveys for Indiana bats by following the protocols below.

EMERGENCE SURVEYS FOR KNOWN INDIANA BAT ROOSTS

The following protocols should begin as soon as feasible after identification of a diurnal roost (ideally that night):

1. Bat emergence surveys should begin one half hour before sunset[49] and continue until at least one hour after sunset or until it is otherwise too dark to see emerging bats. The surveyor(s) should be positioned so that emerging bats will be silhouetted against the sky as they exit the roost. Tallies of emerging bats should be recorded every few minutes or as natural breaks in bat activity allow. There should be at least one surveyor per roost. Surveyors must be close enough to the roost to observe all exiting bats but not close enough to influence emergence. That is, do not stand directly beneath the roost, do not make noise or carry on a conversation, and minimize use of lights (use a small flashlight or similar to record data, if necessary). Do not shine a light on the roost as this may prevent or delay bats from emerging. Use of an infra-red, night vision, or thermal-imaging video camera or spotting scope is encouraged but not required. Likewise, use of an ultrasonic bat detector may aid in identifying the exact timing of bats emerging and may be used to help differentiate between low- and high-frequency bats species, and therefore, is strongly recommended. If multiple roosts are known within a colony, then simultaneous emergence surveys are encouraged to estimate population size. [Note: If a roost cannot be adequately silhouetted, then the local USFWS FO(s) should be contacted to discuss alternative survey methods].

2. Bat activity is affected by weather; therefore emergence surveys should not be conducted when the following conditions exist: (a) temperatures that fall below 50°F (10°C); (b) precipitation, including rain and/or fog, that exceeds 30 minutes or continues intermittently during the survey period; and (c) sustained wind speeds greater than 9 miles/hour (4 meters/second; 3 on Beaufort scale).

3. Surveyors should use the attached (or similar) "Bat Emergence Survey Datasheet".

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[48] A qualified biologist is an individual who holds a USFWS Recovery Permit (Federal Fish and Wildlife Permit) for federally-listed bats in the state/region in which they are surveying and/or has been authorized by the appropriate state agency to mist-net for Indiana bats. Several USFWS offices maintain lists of qualified bat surveyors, and if working in one of those states with authorizations in lieu of a Recovery Permits, the individual will either need to be on that list or submit qualifications to receive USFWS approval prior to conducting any field work.

[49] Surveys may need to start a little earlier or later than one half hour before official sunset times (i.e., before "dusk") in some settings such as deep/dark forested valleys or ridge tops, respectively. Sunset tables for the location of survey can be found at: http://aa.usno.navy.mil/data/docs/RS_OneYear.php

4. Surveyors should also complete an "Indiana Bat Roost Datasheet" for each roost known to be used by one or more Indiana bats (see Appendix D for an example).

5. Completed datasheets should be included in reports prepared for the USFWS.

EMERGENCE SURVEYS FOR POTENTIAL INDIANA BAT ROOSTS

In some limited cases (e.g., individual hazard tree removal during the active season), surveyors may have the option of conducting emergence surveys for individual potential Indiana bat roosts to determine use prior to removal. The following protocol applies to these surveys:

1. Consult with the local USFWS FO(s) to determine whether a tree(s) that needs to be felled/ cleared may be potential roosting habitat for Indiana bats and whether conducting an emergence survey is an appropriate means of avoiding take of Indiana bats[50]. In general, the USFWS only approves of conducting emergence surveys as a means of avoiding direct take of bats for projects that only affect a very small number of potential roosts (e.g., less than or equal to 10)[51] in relatively small project areas. An online directory of USFWS offices is available at: http://www.fws.gov/offices/.

2. If the USFWS FO(s) approves/concurs with Step 1, then follow the emergence guidelines for Emergence Surveys for Known Indiana Bat Roosts (above) to determine if any bats are roosting in the tree(s).

3. At the conclusion of the emergence survey:

    a. If **no** bats were observed emerging from the potential roost(s), then it maybe felled immediately. If safety concerns dictate that a tree cannot be felled immediately (i.e., in the dark), then the tree(s) should be felled as soon as possible after sunrise on the following day. If a tree is not felled during the daytime immediately following an emergence survey, then the survey has to be repeated, because bats may switch roosts on a nightly basis. Immediately after the tree is felled, a visual inspection of the downed tree must be completed to ensure that no bats were present, injured, or killed. The USFWS FO(s) should be contacted immediately, if bats are discovered during this inspection.

    b. If **1 or more** bats (regardless of species, because species identification cannot reliably be made during visual emergence counts alone) are observed emerging from the roost, then it should **not** be felled, and the USFWS FO(s) should be contacted the next working day for further guidance.

[50] If a potential bat roost tree poses an imminent threat to human safety or property, then emergency consultation procedures should be followed as appropriate. (50 CFR §402.05). If a hazard tree does not pose an imminent threat, then the USFWS requests that it be felled during the bat's inactive season (i.e., generally from October – March, but contact the FO for specific dates for your area.) When possible, felling of potential roost/hazard trees should be avoided during the primary maternity period (June – July) to avoid potential adverse effects to non-volant pups.
[51] Areas containing >10 hazard trees will be assessed by the USFWS on a case-by-case basis with the project proponent.

APPENDIX E
PHASE 4 EMERGENCE SURVEYS

SUBMISSION OF EMERGENCE SURVEY RESULTS

Emergence survey results should be included with the mist-netting survey report, unless the survey was completed as an evaluation of potential roosts, and should be submitted to the appropriate USFWS FO(s) for review. Each survey report should include the following information related to emergence survey efforts:

1. Copy of prior phase reports (if not previously provided)
2. Explanation of any modifications from the Phase 4 emergence count study plan (e.g., number of potential roosts surveyed), if applicable
3. Summary of roost emergence data
4. Map identifying location of roost(s) identified during radio-tracking and/or emergence surveys for Indiana bat(s) including GPS coordinates
5. Full names of personnel present during emergence survey efforts and who conducted emergence surveys of roosts
6. Photographs of each identified roost
7. Copies of all "Emergence Survey" and "Indiana Bat Roost" datasheets
8. Any other information requested by the local USFWS FO(s) where work was conducted
9. Copy of the pre-approved site-specific written authorization from USFWS and/or state natural resource agency (if required)

APPENDIX E
PHASE 4 EMERGENCE SURVEYS

USFWS BAT EMERGENCE SURVEY DATASHEET

Date: _____ **Surveyor(s) Full Name:**_____

State: _____ **County:** _____ **Project Name:** _____

Site Name/#: _____ **Roost Name/#** _____ **Bat #:**_____

Lat/Long or UTM of Roost: _____

Description of Roost/Habitat Feature Surveyed: _____

_____

Bat Species Known to be using this Roost/Feature (if not known, leave blank):

_____

Other Suspected Bat Species (explain): _____

Weather Conditions during Survey (temperature, precipitation, wind speed):

_____

Survey Start Time: _____ **Time of Sunset:** _____ **Survey End Time:** _____

NOTE: Emergence surveys should begin ½ hour before sunset and continue for a minimum of 1 hour or until it is otherwise too dark to see emerging bats. The surveyor(s) should position him or herself so that emerging bats will be silhouetted against the sky as they exit the roost. Tallies of emerging bats should be recorded every few minutes or as natural breaks in bat activity allow. Please ensure that surveyor(s) are close enough to the roost to observe all exiting/returning bats, but not close enough to influence emergence (i.e., do not stand directly beneath the roost and do not make unnecessary noise and/or conversation, and minimize use of lights other than a small flashlight to record data, if necessary). Do not shine a light on the roost tree crevice/cave/mine entrance itself as this may prevent or delay bats from emerging. If available, use of an infra-red, night vision, or thermal-imaging video camera or spotting scope and an ultrasonic bat detector are strongly recommended but not required.

Time	Number of Bats Leaving Roost*	Comments / Notes

United States Department of the Interior
Fish and Wildlife Service

Bloomington Field Office (ES)
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273

December 18, 2015

Mr. Scott Doig
Bureau of Indiana Affairs
Midwest Regional Office
5600 West American Boulevard, Suite 500
Bloomington, Minnesota 55437

Project: Proposed Pokagon Band Tribal Village Fee-to-Trust Acquisition and Casino Project
Location: South Bend, St. Joseph County, Indiana

Dear Mr. Doig:

The U.S. Fish and Wildlife Service (FWS) has reviewed the undated draft letter from King & MacGregor Environmental, Inc. provided to us under your cover letter of October 29, 2015. This letter responded to our letter of August 21, 2015 to BIA Regional Director Diane K. Rosen concerning potential habitat at the Pokagon site for the federally threatened northern long-eared bat (*Myotis septentrionalis*).

The FWS in Indiana defines habitat for Indiana and northern long-eared bats as all forested areas except those that are ≤5 acres and isolated from other forested tracts. Isolated means no connectivity with other forested habitat, with the open, non-woodland distance being 1000 feet; brushy ditches or fence lines count as connectivity. In addition, wooded fence lines/ditches that connect wooded areas that are <5 acres are also habitat. As an example, a series of <5 acre wooded parcels that are never more than 1000 feet from the next wooded parcel would be considered habitat. We consider Indiana and/or northern long-eared bats to be present in suitable habitat unless surveys indicate that the likelihood of their presence is discountably low.

In the August 21st letter, we requested that a summer habitat assessment for northern long-eared bats be prepared and provided to us for review in order to determine whether or not the proposed tribal village and casino project was likely to adversely affect this species. However, we were only provided a generalized map of the site on the southwest side of South Bend, showing where woodlands and fencerows would be removed (about 46 acres) and where they would remain (about 58 acres) and the general locations of possible roost trees. No descriptions of the possible

roost trees were provided with the King & MacGregor letter. However, approximately 44 percent of the available woodlands and woody fencerows at the site would be cleared, eliminating about half the identified potential bat roost trees.

We believe this loss of potential habitat to be significant, and that simply limiting tree clearing to the time period when the bats would not be present, which is between October 1 and April 1, is not sufficiently protective of the species.

Because of the project impact on this woodland habitat, we request a commitment to mitigation in the form of planting native trees as close as possible to the project site. We support the upland woodland mitigation guidelines of the Indiana Department of Natural Resources contained in their Information Bulletin #17 (http://www.in.gov/legislative/register/20061213-IR-312060562NRA.xml.pdf) which states that the standard minimum mitigation ratio for non-wetland forest losses of more than 1 acre is to be 2:1 (2 acres replanted for every acre destroyed), planted as close to the impact site as possible. A copy of Information Bulletin #17 is enclosed.

Alternatively, the BIA can conduct surveys for bats during the summer of 2016, generally between June 1 and August 1 in northern Indiana, in order to determine whether or not the northern long-eared bat is unlikely to be present at the Pokagon Village and Casino site. If it is determined that the species in not likely to be present, no mitigation (replacement of the lost habitat) would be necessary.

Please contact Elizabeth McCloskey at (219) 983-9753 or elizabeth_mccloskey@fws.gov for further discussion on this matter.

Sincerely yours,

Elizabeth S. McCloskey
acting
for Scott E. Pruitt
Supervisor

Sent via email December 18, 2015; no hard copy to follow.

cc: Kerrie E. Kuhne, USACE, Regulatory Branch, Detroit, MI
Matt Smedley, IDEM, Office of Water Quality, Indianapolis, IN

NATURAL RESOURCES COMMISSION
Information Bulletin #17
(First Amendment)
Subject: Wetlands and Habitat Mitigation

I. Purpose

The purpose of Information Bulletin #17 is to establish a general framework for the assessment and determination of wetlands or habitat compensatory mitigation where a construction project is likely to reduce or degrade an existing wetland or habitat. The Department of Natural Resources will reference this bulletin when making licensing determinations and when commenting upon federal licenses, such as comments to the U.S. Army Corps of Engineers relative to Section 404 of the Clean Water Act (33 U.S.C. 1344).

The terms of the bulletin are not intended to establish inflexible mitigation standards, however, and are presented with the understanding that each parcel of real estate is unique and offers both challenges and opportunities which are peculiar to the parcel. Neither is the information bulletin intended to deprive an applicant or another interested person of the opportunity for administrative review of a licensing determination; for state licenses, which opportunity will be accorded as provided when a division of the Department of Natural Resources makes a decision to grant, condition, or deny a specific application.

II. Definitions

Unless otherwise provided by law, the following definitions will be applied to this bulletin:

1. "Cumulative effects" means the impact which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what person undertakes the other actions. Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time.
2. "Mitigation" means taking specified action to eliminate, lessen, or replace the loss of environmental benefits and ecological functions where those benefits and functions are disturbed by human activities.
3. "Urban forest" means a wooded area or trees growing within the corporate limits of a city, town, or platted development.
4. "Wetland" means a transitional area between a terrestrial and deep water habitat (but not necessarily adjacent to a deep water habitat) where at most times the area is either covered by shallow water or the water table is at or near the surface and under normal circumstances any of the following are met:
   (A) The area predominantly supports hydrophytes, at least periodically, or the substrate is predominantly undrained hydric soil, for example, peat or muck.
   (B) The substrate is not a soil but is instead saturated with water or covered by shallow water some time during the growing season, for example, marl beaches or sand bars.

III. Background

In 1990, the Indiana Department of Natural Resources, the Indiana Department of Transportation, and the U.S. Fish and Wildlife Service determined standardization among these agencies would be beneficial with regard to wetlands mitigation. No standard mitigation ratios were established by law, and license applicants attempted to reach agreement on an individual project basis with no general guidance. Toward the goal of standardization, a memorandum was developed among these three agencies and remains in effect. Generally, mitigation ratios for projects of the department transportation range from 1:1 to 4:1 or higher.

The agency memorandum of understanding has no direct application, however, to private developers or to governmental agencies other than the signatories. Developing a memorandum of understanding to incorporate all private developers was a practical impossibility, but the need for guidance is even more acute. By far, the greatest impact upon wetlands and other habitats derives from private development and sources other than the Department of Transportation. The development of a wetlands and habitat mitigation bulletin was viewed as the most flexible method for addressing these interests.

IV. Application

Although state legislation administered by the Department of Natural Resources does not typically address wetlands or habitat by this terminology, the broad language contained within several programs expresses a clear legislative mandate that environmental and resource functions and benefits be considered in the regulatory process. Notable among these are IC 14-28-1, IC 14-26-2, IC 14-26-5, and IC 14-29-1. For example, the Flood Control Act (IC 14-28-1) precludes the issuance of a license which will have "unreasonably detrimental affects upon fish, wildlife, or botanical resources".

The Lake Preservation Act (IC 14-26-2) protects against activities which would threaten the "natural resources and natural scenic beauty" of Indiana's public freshwater lakes. At the heart of these environmental and resource values are wetlands.

To be noted, initially, is that some license applications must properly be denied in order to maintain the

integrity of the statutory pronouncements. Mitigation is in many instances a viable alternative to denial, however, and the purpose of this bulletin is to assist in identifying how mitigation will be applied.

A compensatory mitigation procedure may be accomplished by various methods. The procedure is often defined in terms of a ratio of units replaced to units altered. In other words, three acres may be replaced or reconstructed for one acre adversely impacted or destroyed. In short terms, this compensatory mitigation is described as a ratio of 3:1.

Compensatory mitigation for disturbances to natural resources is the final alternative which should be considered when a project is planned. The sequence to follow during project planning is

1. avoidance of disturbance;
2. minimization of disturbance; and
3. where these two alternatives do not dispose of the issue, compensatory mitigation for the loss of natural resources.

Mitigation ratios for wetlands and habitat should generally be greater than 1:1 for several reasons. There is typically a long term loss of values and functions of the impacted resources before a constructed or reconstructed area is developed. There is also the risk that the values and functions of the original area may not be fully replaced by the mitigation effort. There is a loss of production when a habitat is destroyed, and this production may never be equaled within the replacement area. With this foundation, the following chart is adopted for use in measuring wetlands and habitat mitigation:

DEPARTMENT OF NATURAL RESOURCES
WETLANDS AND HABITAT MITIGATION GUIDELINES

Habitat Category	Standard Minimum
1. Palustrine Emergent Wetland	2:1
2. Non-wetland Forest (more than one acre of disturbance)	2:1
3. Palustrine Scrub-Shrub Wetland	3:1
4. Palustrine Forested Wetland	4:1

The standard minimum ratio assumes that the functions and values of the original habitat will be replaced in the same watershed as a result of compensatory mitigation. All ratios are in land measurements. The ratio is defined as the amount of area to be replaced or created (the first number): the amount of area being disturbed (the second number). There are several criteria pertaining to the disturbed habitat or the replacement habitat which influence the environmental value of the habitat area. When one or more of these criteria apply to the existing or replacement habitat, there will be an increase (or possibly a decrease) to the standard minimum ratio. Each of these criteria can increase or decrease the standard minimum by a factor from 0 to 1.0 in increments of 0.25. An activity that requires the adjustment of the standard mitigation ratio by a total increase greater than 2.0 will, most likely, be recommended for denial. These factors will be applied on a case-by-case basis. Where the following criteria apply to the existing or replacement habitat, the compensatory mitigation ratio requirement will be adjusted from the standard minimum:

a) Proximity of the replacement habitat to the disturbed habitat. The standard minimum ratio may be increased if replacement does not occur on the same stream or within a 2.5 mile diameter of the disturbed site. This factor will be revised to require replacement within the same 14-digit Hydrologic Unit Code Area as the 14-digit Hydrologic Unit Code Area Maps are developed and become available. Maps for all counties in Indiana should be available by the end of 1999. Since 14-digit hydrologic units are between two and three miles in diameter, these maps will provide a basis for wetland replacement in the same watershed or within 2.5 miles of the disturbed site.

Examples of increased ratio:

+ 0.50 Mitigation site not on same stream, but site is on a nearby stream and within 2.5 miles from the disturbed site. (Mitigation site not within the same 14-digit hydrologic unit, but within an adjacent 14-digit hydrologic unit)

+ 1.0 Mitigation site on the same stream or a nearby stream and is greater than 2.5 miles from the disturbed site. (Mitigation site not within the same or adjacent 14-digit hydrologic unit, but within the same 8-digit hydrologic unit)

Mitigation outside of the 8-digit hydrologic unit will likely be denied.

b) Cumulative effect of the activity. The standard minimum ratio may be increased when the impact on the disturbed area results in an incremental impact when added to other past, present, and reasonably foreseeable future disturbance to the area.

Examples of increased ratio:

+ 0.25 Riparian corridor development is common so that there is very limited or nonexistent fish or wildlife habitat remaining

+ 0.50 Riparian corridor development has occurred, but there is functional fish and wildlife habitat remaining.

The proposed project will result in additional losses to the remaining fish and wildlife habitat +0.75 to 1.0 Either of these two conditions exist. The proposed project will result in the loss of the last remaining fish and wildlife habitat within the area. Or, the proposed project is the first or nearly the first development that will result in fish and wildlife habitat losses in th e area and there is the knowledge that the proposed project approval will invite additional projects in the area.

c) Location of the disturbed habitat to include such considerations as riparian corridor, community structure and composition, species diversity, and quality degradation. The standard minimum ratio may be increased when it is determined that one or more of these considerations apply and are a major influence in the functions and benefits of the habitat. The standard minimum ratio may be decreased in instances where the quality of the replacement habitat, in terms of functions and benefits, exceeds the quality of the disturbed habitat because either:

1. degradation has occurred to the existing habitat; or
2. improved interspersion of habitats, community structure, or species composition is likely to occur as a result of the replacement.

Examples of increased or decreased ratios:

+0.25 The site contains at least a 50-foot wide diverse wooded riparian corridor interspersed with at least one other habitat type

+0.50 Either of these conditions are present at the site. There is at least a 50-foot wide diverse wooded riparian corridor interspersed with more than one other habitat type. Or, there is a diverse wooded corridor greater than 100 feet wide

+0.75 or 1.0 There is a diverse wooded corridor greater than 100 feet wide which is interspersed with more than one other habitat type, or there are more than two habitat types interspersed at the site

-0.50 or 1.0 The habitat to be disturbed is degraded and no longer performs some or all of the functions it is capable of performing. The mitigation site will be capable of performing most or all of the functions lost at the disturbed site

d) Other habitats of concern

These guidelines do not specifically address all possible habitats, such as lacustrine and riverine wetlands. Disturbance of these habitats is discouraged but may be unavoidable for certain projects. The Indiana Department of Natural Resources and Indiana Department of Environmental Management offer numerous techniques to minimize negative impacts to these resources and to enhance their functions for erosion, sedimentation, and fish and wildlife. These techniques may also be required as a compensatory mitigation requirement for disturbance of these habitats.

Urban forests are not specifically addressed in the guidelines. If the disturbed area has more than one acre of tree removal, mitigation will be required as specified in the standard ratios. When the disturbed area has less than one acre of tree removal, five trees shall be planted for each tree that is removed having a diameter of at least 10 inches.

Denial of projects in some areas is likely, or mitigation ratios exceeding these guidelines may be required, if disturbance is permitted. Examples include:

1. disturbance to areas owned or managed by the department of natural resources;
2. exceptional and extremely rare habitats (such as bogs) that cannot, or are extremely difficult to reconstruct; and
3. critical habitat for endangered and threatened species.

V. History

This information bulletin was published on September 1, 1997, at 20 IR 3546. On November 14, 2006, the Commission reviewed and affirmed this bulletin. The November 2006 amendments modified formatting and added a history section.

Posted: 12/13/2006 by Legislative Services Agency
An html version of this document.

United States Department of the Interior
Fish and Wildlife Service

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February 19, 2016

Ms. Diane K. Rosen
Regional Director
Bureau of Indian Affairs
Midwest Regional Office
5600 West American Boulevard, Suite 500
Bloomington, Minnesota 55437

RE: Pokagon Band Tribal Village Fee-to-Trust Acquisition and Casino Project, South Bend, St. Joseph County, Indiana

Dear Ms. Rosen:

The U.S. Fish and Wildlife Service has reviewed your January 28, 2016 letter concerning the likelihood of the Federally threatened northern long-eared bat (*Myotis septentrionalis*) being impacted by the proposed development of the Pokagon Band Tribal Village and Casino Project at South Bend, Indiana. You have determined, based upon the 4(d) Rule developed for the species and published in the January 14, 2016 Federal Register, that the proposed project is not likely to adversely affect the northern long-eared bat. There are no known hibernacula or occupied maternity roost trees at the site.

The U.S. Fish and Wildlife Service concurs with your determination that the proposed project is not likely to adversely affect this threatened species.

This precludes the need for further consultation on this project as required under Section 7 of the Endangered Species Act of 1973, as amended. However, should new information arise pertaining to project plans or a revised species list be published, please contact us for further consultation.

For further discussion, please contact Elizabeth McCloskey at (219) 983-9753 or elizabeth_mccloskey@fws.gov.

Sincerely yours,

Elizabeth S. McCloskey
for Scott E. Pruitt Acting
Supervisor

Sent via email February 19, 2016; no hard copy to follow.

cc: Scott Doig, BIA, Acting Regional Environmental Scientist, Bloomington, MN
Kerrie Kuhne, USCOE, Detroit District, Detroit, MI
Matt Smedley, IDEM, Office of Water Quality, Indianapolis, IN