Effects of Site Management on the Avian Fauna of the Babe Woodyard State Natural Area, Vermilion County, Illinois

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Introduction

The Illinois Department of Natural Resources (IDNR) has recently acquired and begun development of the Babe Woodyard State Natural Area (BWSNA) in Vermilion Co., Illinois (Figure 1). In 1995 and 1996, at the request of IDNR, I conducted an inventory of the existing bird community in the BWSNA, with an emphasis on interior woodland species and a report was submitted to IDNR on 13 January 1997 (Amundsen 1997). IDNR used the information provided by this report to assist in the formulation of the management plan for this property. The management plan includes the development of recreational trails and a primitive campground, the removal of multiflora rose (*Rosa multiflora*) and fescue grass (*Festuca pratensis*) in old pastures, and the planting of trees in former row-crop fields within the site.

Anthropogentic changes have greatly altered the original landscape of the BWSNA. Areas strip-mined during the early part of the 20th century have largely reverted back to mature forest. However, agricultural inholdings and access roads still fragment the site. The predominance of edge associated with fragmentation has been shown to have adverse impacts on the breeding productivity of birds nesting near these edges through an increased potential of parasitism by Brown-headed Cowbirds and higher predation rates (Askins 1994, Rich et al. 1994, Ortega and Capen 1999). Studies indicate that some forest interior birds avoid breeding near edges or nest at lower densities in the vicinity of narrow hiking trails (Hickmann 1990, Fletcher et al. 1999, Fernandaz-Juric 2000).

Tree planting in peripheral and interior old fields is being carried out with the intent of increasing the amount of forest core area. As the habitat structure progresses from oldfield through shrubland to closed woodland, a transition in the avian community composition is expected to occur. Grassland bird species would gradually be replaced by shrubland species which in turn would be replaced by forest interior species (Karr 1968). It would also be predicted that forest interior bird already present in the existing forest, especially area sensitive species (i.e. species that avoid forests that are less than a specific size), will increase in number in the larger woodland tracts created by the reforestation of the oldfields (Askins and Philbrick 1987, Blake and Karr 1984, Wenny et al. 1993).

This study was designed primarily to produce a baseline data set that could be used to gauge the impact on the avian community produced by the development of this site.

Study Area and Methods

The Babe Woodyard State Natural Area is located in southeast Vermilion County, 4.8 km southeast of Georgetown, 19.3 km south of Danville and 3.2 km west of the Illinois-Indiana state line. This 423 ha site was once the property of the Peabody Coal Company, and a number of segments were strip-mined during the first half of the 20th century. Agricultural row-crop fields were also located on this site. Upland and floodplain forests are mainly confined to heavily ravined areas and to areas that border the Little Vermilion River which flows through the property.

Thirty five census points were established, including some that were selected from points visited during the 1995/96 survey and newly established points within the former row-cropped fields and areas not previously surveyed that will contain hiking trails and other developement (Figures 2 & 3). Census points were categorized into four habitat types: forest, edge (between forest and oldfield), oldfield and wetland (Table 1). All oldfields censused were recently planted or will be soon be planted with hardwood tree saplings in accordance with the management plan to increase forest core area. Forested census points were further differentiated by proposed management treatments: forest with existing trail (5 points), forest with no planned development (7 points), forest with proposed trail development (4 points) and a proposed campground (1 point). Census points at edges were also further differentiated into two categories: edge with no trail proposed and edge with proposed trail. Legal descriptions of these points are given in Table 2. A brief description of the habitat surrounding each census point is provided in Table 3. All points were visited twelve times over a twelve month period.

I divide the year into four census seasons corresponding to major periods of the avian life cycle in the Midwest (Table 4). Because of the migratory habits of birds, each of these seasons is expected to have a different and distinctive complement of resident species. Four censuses were made during the fall season, two during the winter season, two during the spring season and four during the breeding season. During these visits I used modified point-counts (Ralph et al. 1995) to determine community composition. I recorded all individuals seen or heard within a range of 75 m (including birds seen flying over) during the ten-minute count periods. Censuses were conducted between one half hour before sunrise and 11:00 am on days without appreciable wind or rain. These timed counts provide measures of the structure of the bird communities (number of individuals and

number of species) within the various habitat types. In order to facilitate comparisons between samples of uneven size, the mean number of birds per point in each treatment type was calculated by dividing the total number of birds recorded in each treatment type by the number of points located in each treatment and by the number of visits per season. The complete results of the timed censuses are provided in Appendix A.

Results

One hundred twenty eight species representing 38 families were recorded at the BWSNA during the twelve months of this study (Table 5). This total included two Illinois endangered species, the Northern Harrier and the Henslow's Sparrow; two Illinois threatened species, the Bald Eagle, which is also Federally threatened, and the Brown Creeper; and three Illinois watch-list species, the Common Snipe, the Golden-winged Warbler and the Cerulean Warbler.

Breeding Season

Forest Census Points: Sixty one species were recorded during the breeding season survey period at census points located in forested habitats (Table 6). Fifty three of these species were observed at census points that are located in areas that will be left undisturbed or in areas that are scheduled for management treatments (i.e. trail or campground development) but are presently relatively undisturbed. The mean number of birds recorded per visit to these points was 10.23. Forty five species were recorded at points located on existing roads or trails in forested sections of the BWSNA. The mean number of birds at these points was 10.30 birds per visit. Two Illinois Watch-list species, the Golden-winged Warbler, recorded at Census Point 11, and the Cerulean Warbler, recorded at Census Points 19 and 34, were observed during the breeding season survey.

Edge Census Points: Fifty five species were recorded during the breeding season census period at census points situated on edges (Table 7). The mean number of birds recorded per visit at all points was 10.31. The mean number of birds recorded at points located at sites with no planned development and sites scheduled for trail development was 10.00 and 10.63 birds per visit respectively. One Illinois endangered species, the Henslow's Sparrow, was recorded at Census Point 25 during the breeding season survey period.

Oldfield Census Points: Fourteen species were recorded during the breeding season survey at census points located in oldfields (Table 8). The mean number of birds recorded per visit at these points was 7.25. One Illinois endangered species, the Henslow's Sparrow, was recorded at Census Point 26 during the breeding season survey period.

Wetland Census Point: Eight species were recorded in the wetland during the breeding season survey period (Table 9). The mean number of birds recorded per visit was 7.75.

Fall Season

Forest Census Points: Forty seven species were recorded during the fall season survey period at census points located in forested habitats (Table 10). Thirty six of these species were observed at census points located in areas that will be left undisturbed or in areas that are scheduled for management treatments (i.e. trails or campground development) but are presently relatively undisturbed. The mean number of birds recorded per visit to these points was 6.49. Thirty one species were recorded at points located on existing roads or trails in forested sections of the BWSNA. The mean number of birds at these points was 5.95 birds per visit. One Illinois Watch-list species, the Golden-winged Warbler, was recorded during the fall season survey at census point 11.

Edge Census Points: Forty one species were recorded during the fall season census period at census points situated on edges (Table 11). The mean number of birds recorded per visit at all points was 4.99. The mean number of birds recorded at points located at sites scheduled for no development and sites scheduled for trail development was 4.13 and 5.86 birds per visit, respectively. No Illinois or federally listed species were recorded during the fall season survey period at edge points.

Oldfield Census Points: Twenty species were recorded during the fall season survey at census points located in oldfields (Table 12). The mean number of birds recorded per visit at these points was 1.96. No listed species were recorded during the timed censuses at oldfield census points.

Wetland Census Point: Eight species were recorded during the timed censuses conducted in the wetland during the fall season survey period (Table 13). The mean number of birds recorded per visit was 3.00. One Illinois endangered species, the

Northern Harrier, was recorded during the timed censuses conducted during the fall census period at the wetland.

Winter Season

Forest Census Points: Sixteen species were recorded during the winter season survey period at census points located in forested habitats (Table 14). Fourteen of these species were observed at census points that are located in areas that will be left undisturbed or in areas that are scheduled for management but are presently relatively undisturbed treatments (i.e. trails or campground development). The mean number of birds recorded per visit to these points was 4.52. Ten species were recorded at points located on existing roads or trails in forested sections of the BWSNA. The mean number of birds at these points was 4.50 birds per visit. No listed species were recorded at forest census points during the winter season survey.

Edge Census Points: Thirteen species were recorded during the winter season census period at census points situated on edges (Table 14). The mean number of birds recorded per visit at all points was 5.11. The mean number of birds recorded at points located at sites scheduled for no development and sites scheduled for trail development was 5.00 and 5.21 birds per visit, respectively. No Illinois or federally listed species were recorded during the winter season survey period at edge points.

Oldfield Census Points: Five species were recorded during the winter season survey at census points located in oldfields (Table 16). The mean number of birds recorded per visit at these points was 0.71. No listed species were recorded within 75 m of an oldfield census point during the winter season timed censuses; however, one Northern Harrier (Illinois endangered) was observed foraging over the oldfield surrounding Census Point 20.

Wetland Census Point: Nine species were recorded in the wetland during the winter season survey period (Table 17). The mean number of birds recorded per visit was 9.50. No listed species were recorded during the timed censuses conducted during the winter census period at the wetland.

Spring Season

Forest Census Points: Thirty species were recorded during the spring season survey period at census points located in forested habitats (Table 18). Twenty eight of these species were observed at census points that are located in areas that will be left undisturbed or in areas scheduled for management treatments (i.e. trails or campground development but presently relatively undisturbed. The mean number of birds recorded per visit to these points was 6.29. Nineteen species were recorded at points located on existing roads or trails in forested sections of the BWSNA. The mean number of birds at these points was 6.10 birds per visit. One Illinois threatened species, the Brown Creeper, was recorded at forest Census Point 19 during the spring season survey.

Edge Census Points: Thirty one species were recorded during the spring season census period at census points situated on edges (Table 19). The mean number of birds recorded per visit at all points was 6.38. The mean number of birds recorded at points located at sites scheduled for no development and sites scheduled for trail development was 6.75 and 6.00 birds per visit, respectively. No Illinois or federally listed species were recorded at edge points during the spring season survey period.

Oldfield Census Points: Eight species were recorded during the spring season survey at census points located in oldfields (Table 20). The mean number of birds recorded per visit at these points was 2.64. No listed species were recorded during the spring season timed censuses at oldfield census points.

Wetland Census Point: Four species were recorded in the wetland during the spring season timed censuses (Table 21). The mean number of birds recorded per visit was 7.00. One Illinois Watch-list species, the Common Snipe, was recorded during the timed censuses conducted during the spring census period at the wetland.

Discussion

This study was designed basically to provided a baseline data set that can be used in future studies to gauge the impact of management practices on the avian community found within the BWSNA. However, the results of the present study can be used to describe the existing community and to predict changes induced by the management plan.

Forest census points: There was little difference between the mean number of birds detected at undisturbed sites and sites with an existing trail during any season (Tables 5, 9, 13 and 17). However, there was a slight, though most likely not significant, trend for forest interior species (i.e. Ovenbird, Red-eyed Vireo and Great Crested Flycatcher) to exhibit higher densities at undisturbed sites. Because the forests at the BWSNA are presently highly fragmented with little forest core area, it is not surprising that there is no easily discernible differences in community structure at sites with and without trails. Reduced winter season numbers were as expected with overall reduced densities and species richness at all treatments.

Three Brown Creepers were detected near Census Point 19 during the spring census period. These birds were most likely migrants and did not remain to breed at the BWSNA. This species was also detected at Census Points 10 and 12 during the fall survey period. These birds were also most likely migrants.

The Golden-winged Warbler, which does not breed in forested habitats, was detected during the early breeding season and was most likely a late migrant. One Cerulean Warbler was detected at Census Point 34 on 18 May 2000 and a second bird was recorded at Census Point 19 on 26 May. Because this species was not detected near these points during later surveys, it is most likely they were late migrants and did not breed at the BWSNA.

Edge census points: The composition of the avian community near proposed trails along the interface between the forest and reforested oldfields is expected to change as the planted trees mature. The composition is presently a mix of forest interior, edge and grassland species. As the oldfield passes through different seral stages there will be a corresponding progressive change in species composition culminating in a forest interior assemblage.

One Brown Creeper was observed foraging near Census Point 21 during the spring census period. This individual was a most likely a migrant which did not remain to breed at the BWSNA.

Oldfield census points: As the trees in the reforested oldfields approach maturity, it would be predicted that the densities and numbers of forest interior species will increase as the total core area of the forest grows.

A small population of Henslow's Sparrows resided in one oldfield, planted with sapling hardwood trees in 1999, during the breeding season (Figure). Oldfield Census Point 26 and edge Census Points 25 and 27 are located at this site. Because this field is being managed as a reforestation site and not a grassland, the vegetation structure will gradually become less conducive to attracting breeding Henslow's Sparrows.

One Northern Harrier was observed foraging over the oldfield containing Census Point 20. This individual was most likely a fall migrant and did not breed within the BWSNA.

Wetland census point: Few species used the existing wetland now located where the lake and reconstructed wetland are to be developed. One vagrant Northern Harrier, Illinois endangered, was flushed from the marsh during the winter survey. The one Illinois Watch-list species, the Common Snipe, detected during the spring census period was not recorded during the breeding season survey and most likely did not breed at this site.

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Table 1. Treatment classification of census points used during the 1999/2000 avian survey conducted at the Babe Woodyard State Natural Area, Vermilion County, Illinois.

Treatment Subtreatment	Census points	
Forested Habitat		
No Development Proposed (NDP)	3, 10, 12, 17, 22, 28, 31, 33	
Proposed Trail (PT)	5, 6, 29, 30	
Proposed Campground (PC)	2	
Existing Trail	1, 11, 16, 19, 34	
Edge Habitat		
No Development Proposed (NDP)	13, 25	
Proposed Trail (PT)	4, 7, 9, 15, 21, 23, 27	
Oldfield Habitat Plantings (OHP)	8, 14, 18, 20, 24, 26, 35	
Wetland (WC)	32	

Table 2. Legal location of census points used during the 1999/2000 avian survey conducted at the Babe Woodyard State Natural Area, Vermilion County, Illinois.

Census Point	Legal Location
1	UTM Zone 16 4,424,600mN 450,175mE
	Vermilion Co., IL; T 18 N, R 11 E; Section 34, NW/4, SE/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
2	UTM Zone 16 4,424,750mN 450,300mE
	Vermilion Co., IL; T 18 N, R 11 E; Section 34, NE/4, SE/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
3	UTM Zone 16 4,424,650mN 450,400mE
	Vermilion Co., IL; T 18 N, R 11 E; Section 34, NE/4, SE/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
4	UTM Zone 16 4,424,200mN 450,350mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 3, NE/4, NE/4, NE/4; Humrick, IL 7.5' series USGS topographic map.
5	UTM Zone 16 4,424,300mN 450,950mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NW/4, NE/4, NW/4; Humrick, IL 7.5' series USGS topographic map.
6	UTM Zone 16 4,424,350mN 451,200mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NE/4, NE/4, NW/4; Humrick, IL 7.5' series USGS topographic map.

Table 2. Legal location of census points (continued).

Census Point	Legal Location
7	UTM Zone 16 4,424,525mN 451,375mE
	Vermilion Co., IL; T 18 N, R 11 E; Section 35, SW/4, SW/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
8	UTM Zone 16 4,424,600mN 451,600mE
	Vermilion Co., IL; T 18 N, R 11 E; Section 35, SE/4, SW/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
9	UTM Zone 16 4,424,500mN 451,675mE
	Vermilion Co., IL; T 18 N, R 11 E; Section 35, SE/4, SW/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
10	UTM Zone 16 4,424,075mN 451,600mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, SE/4, NW/4, NE/4; Humrick, IL 7.5' series USGS topographic map.
11	UTM Zone 16 4,423,750mN 451,775mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, SW/4, SE/4, NE/4; Humrick, IL 7.5' series USGS topographic map.
12	UTM Zone 16 4,423,350mN 452,100mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, SE/4, NE/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
13	UTM Zone 16 4,423,300mN 451,950mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, SE/4, NE/4, SE/4; Humrick, IL 7.5' series USGS topographic map.

Table 2. Legal location of census points (continued).

Census Point	Legal Location
14	UTM Zone 16 4,423,300mN 451,800mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, SW/4, NE/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
15	UTM Zone 16 4,423,500mN 451,750mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NW/4, NE/4, SW/4; Humrick, IL 7.5' series USGS topographic map.
16	UTM Zone 16 4,423,300mN 451,575mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, SE/4, NW/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
17	UTM Zone 16 4,423,375mN 451,500mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NW/4, NW/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
18	UTM Zone 16 4,423,550mN 451,200mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, SE/4, NE/4, NW/4; Humrick, IL 7.5' series USGS topographic map.
19	UTM Zone 16 4,424,050mN 451,150mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NE/4, SE/4, SE/4; Humrick, IL 7.5' series USGS topographic map.
20	UTM Zone 16 4,423,925mN 450,250mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 3, NW/4, SE/4, NE/4; Humrick, IL 7.5' series USGS topographic map.

Table 2. Legal location of census points (continued).

Census Point	Legal Location
21	UTM Zone 16 4,423,925mN 450,475mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 3, NE/4, SE/4, NE/4; Humrick, IL 7.5' series USGS topographic map.
22	UTM Zone 16 4,423,925mN 450,600mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NW/4, SW/4, NW/4; Humrick, IL 7.5' series USGS topographic map.
23	UTM Zone 16 4,423,875mN 450,600mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NW/4, SW/4, NW/4; Humrick, IL 7.5' series USGS topographic map.
24	UTM Zone 16 4,423,775mN 450,700mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NW/4, SW/4, NW/4; Humrick, IL 7.5' series USGS topographic map.
25	UTM Zone 16 4,423,550mN 450,900mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NE/4, NW/4, SW/4; Humrick, IL 7.5' series USGS topographic map.
26	UTM Zone 16 4,423,400mN 450,800mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NE/4, NW/4, SW/4; Humrick, IL 7.5' series USGS topographic map.
27	UTM Zone 16 4,423,425mN 450,900mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NW/4, NE/4, SW/4; Humrick, IL 7.5' series USGS topographic map.
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Table 2 continued on following page

Table 2. Legal location of census points (continued).

Census Point	Legal Location
28	UTM Zone 16 4,423,400mN 451,075mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NW/4, NE/4, SW/4; Humrick, IL 7.5' series USGS topographic map.
29	UTM Zone 16 4,423,225mN 451,125mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, SE/4, NE/4, SW/4; Humrick, IL 7.5' series USGS topographic map.
30	UTM Zone 16 4,423,025mN 451,025mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, NW/4, SE/4, SW/4; Humrick, IL 7.5' series USGS topographic map.
31	UTM Zone 16 4,422,850mN 451,200mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 2, SE/4, SE/4, SW/4; Humrick, IL 7.5' series USGS topographic map.
32	UTM Zone 16 4,423,450mN 450,250mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 3, NW/4, NE/4, SW/4; Humrick, IL 7.5' series USGS topographic map.
33	UTM Zone 16 4,422,675mN 451,825mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 11, NW/4, NE/4, NE/4; Humrick, IL 7.5' series USGS topographic map.
34	UTM Zone 16 4,422,600mN 452,000mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 11, NE/4, NE/4, NE/4; Humrick, IL 7.5' series USGS topographic map.

Table 2 concluded on following page

Table 2. Legal location of census points (concluded).

Census Point	Legal Location
35	UTM Zone 16 4,422,650mN 452,325mE
	Vermilion Co., IL; T 17 N, R 11 E; Section 12, NW/4, NW/4, NW/4; Humrick, IL 7.5' series USGS topographic map.

Table 3. Description of habitat surrounding census points used during the 1999/2000 avian census conducted at the Babe Woodyard State Natural Area, Vermilion County, Illinois.

Census Point	Habitat Description
1	Abandoned railway right-of-way surrounded by upland forest. Proposed hard surface trail.
2	Open upland forest. Site of proposed primitive campground.
3	Open upland forest. No development planned.
4	Edge between abandoned bottomland field containing cedars and shrubs and narrow riparian woodland. Proposed hiking trail.
5	Upland forest. Proposed hiking trail.
6	Abandoned field shrubland. Proposed hiking trail.
7	Edge between upland forest and old field with grass, herbaceous cover and trees planted in 1997. No other development proposed.
8	Old field with grass and forb cover. Trees planted for reforestation in 1997.
9	Edge between upland forest and old field with grass, herbaceous cover and trees planted in 1997. Proposed hiking trail.
10	Upland forest. No proposed development.
11	Dirt access road surrounded by upland forest. Will be maintained as access road and hiking trail.
12	Upland forest. No development proposed.
13	Edge between upland forest and old field with grass, herbaceous cover and trees planted in 1997. No other development proposed.
14	Old field with grass and herbaceous and cover. Trees planted for reforestation in 1997.

Table 3 continued on following page

Table 3. Description of habitat Continued.

Census Point	Habitat Description
15	Edge between upland forest and oldfield with grass, herbaceous cover and trees planted in 1997. Proposed hiking trail.
16	Dirt access road surrounded by upland forest. Will be maintained as hiking trail.
17	Upland forest. No development proposed.
18	Bottomland oldfield with grass, herbaceous cover and trees planted in 1998. No other development proposed.
19	Dirt access road surrounded by bottomland forest. Will be maintained as hiking trail.
20	Oldfield with grass and herbaceous and cover. Trees planted for reforestation in 1999.
21	Edge between upland forest and oldfield with grass, herbaceous cover and trees planted in 1999. Proposed hiking trail.
22	Ravine forest below proposed dam and fishing lake.
23	Edge between upland forest and old field with grass, herbaceous cover and trees planted in 1999. No other development proposed.
24	Oldfield with grass and forb cover. Trees planted for reforestation in 1999.
25	Edge between upland forest and old field with grass, herbaceous cover and trees planted in 1999. No other development proposed.
26	Oldfield with grass and forb cover. Trees planted for reforestation in 1999.
27	Edge between upland forest and oldfield with grass, herbaceous cover and trees planted in 1999. Proposed hiking trail.

Table 3 concluded on following page

Table 3. Description of habitat concluded.

Census Point	Habitat Description
28	Upland forest. No development proposed.
29	Upland forest. No development proposed.
30	Upland forest. Proposed hiking trail.
31	Upland forest. No development proposed.
32	Existing grassland / wetland. Expanded wetland above proposed fishing lake.
33	Upland forest. No development proposed.
34	Access road surrounded by upland forest. Will be maintained as hiking trail.
35	Old pasture with grass and herbaceous cover. multiflora rose eradication area, burned in 1999. Proposed savanna creation.

Table 4. Inclusive dates defining the winter, spring, breeding and fall census seasons used during the avian survey at the Babe Woodyard State Natural Area, Vermilion County, Illinois.

Season	Inclusive dates
Winter	1 December to 28 February
Spring	1 March to 30 April
Breeding	1 May to 31 August
Fall	1 September to 30 November

Table 5. List of bird species observed during the 1995/1996 (Amundsen 1997) and 1999/2000 surveys conducted at Babe Woodyard State Natural Area, Vermilion County, Illinois. Nomenclature and taxonomic order from A.O.U. Check-list of North American Birds 1998.

<u>Family</u> Subfamil	y		Obse	rved
Cor	nmon Name	Scientific name	95/96	99/00
<u>Ardeidae</u>				
	at Blue Heron en Heron	Ardea herodias Butorides virescens	X	X X
<u>Cathartidae</u>				
Turk	cey Vulture	Cathartes aura	X	X
<u>Anatidae</u> Anserinae				
Cana	ada Goose	Branta canadensis	X	X
Anatinae				
Woo Mall	d Duck ard	Aix sponsa Anas platyrhynchos	X X	X X
Accipteridae Acciptrina	e			
North	Eagle FT IT nern Harrier IE	Haliaeetus leucocephalus Circus cyaneus		X X
Coop	o-shinned Hawk per's hawk	Accipiter striatus Accipiter cooperii Butoo platoptorus	X	X X X
Red-t	d-winged Hawk ailed Hawk h-legged Hawk	Buteo platypterus Buteo jamaicensis Buteo lagopus	X X	X X X
Falconidae Falconinae				
Amer	ican Kestrel	Falco sparvius	X	X

Table 5. List of bird species (continued).

Subfamily			Obse	erved
Common	n Name	Scientific name	95/96	99/00
Phasianidae Phasianinae				
Ring-nec	cked Pheasant IN	Phasianus colchicus	X	x
Meleagrindina	ne			
Wild Tu	key	Meleagris gallopavo	X	X
Odontophoridae				
Northern	Bobwhite	Colinus virginianus	X	X
<u>Charadriidae</u>				
Killdeer	·	Charadrius vociferus	X	X
Scolopacidae				
Common American	Snipe WL Woodcock	Gallinago gallinago Scolopax minor		X X
<u>Columbidae</u>				
Rock Do Mourning		Columbia livia Zenaida macroura	X X	x
<u>Cucuidae</u>				
	led Cuckoo illed Cuckoo	Coccyzus erthropthalmus Coccyzus americanus	X X	X
<u>Strigidae</u>				
Great Hor Barred O		Bubo virginianus Strix varia	X X	X X
<u>Caprimulgidae</u>				
Common	Nighthawk	Chordeiles minor	X	

Table 5. List of bird species (continued).

Subf	amily		Obse	erved
	Common Name	Scientific name	95/96	99/00
<u>Frochilidae</u> Troc	hilinae			
	Ruby-throated Hummingbird	Archilochus colubris	X	X
Alcedinidae Ceryl	inae			
	Belted Kingfisher	Ceryle alcyon	X	. X
<u>Picidae</u> Picin	ae			
	Red-headed Woodpecker	Melanerpes erythocephalus	X	X
	Red-bellied Woodpecker	Melanerpes carolinus	X	X
	Yellow-bellied Sapsucker	Sphyrapicus varius	X	X
	Downy Woodpecker	Picoides pubescens Picoides villosus	X X	X X
	Hairy Woodpecker Northern Flicker	Colaptes auratus	X	X
	Pileated Woodpecker	Dryocopus pileatus	X	X
<u>Fyranidae</u>				
Fluvi	colinae			
	Eastern Wood-pewee	Contopus virens	X	Х
	Acadian Flycatcher	Empidonax virescens	X	X
	Alder Flycatcher	Empidonax alnorum		X
	Least Flycatcher	Empidonax mininus	X	X
	Eastern Pheobe	Sayomis pheobe	X	X
Tyraı	nninae			
	Great Crested Flycatcher	Myiarchus crinitus	X	X

Table 5. List of bird species (continued).

Family Subf	amily		Obse	erved
	Common Name	Scientific name	95/96	99/00
<u>Vireonidae</u>				
	White-eyed Vireo Blue-headed (Solitary) Vireo	Vireo griseus Vireo solitarius	X X	X
	Yellow-throated Vireo	Vireo flavifrons	X	X
	Warbling Vireo	Vireo gilvus	X	X
	Red-eyed Vireo	Vireo olivaceus	X	X
<u>Corvidae</u>				
	Blue Jay	Cyanocitta cristata	X	X
	American Crow	Corvus brachyrhynchos	X	X
<u>Alaudidae</u>				
	Horned Lark	Eremophila alpestris	X	X
<u>Hirundinid</u>	<u>ae</u>			
	Tree Swallow Northern Rough-winged Swa	Tachycinete bicolor		X
	winged by	Stelgidopteryx serripennis	X	X
<u>Paridae</u>	Barn Swallow	Hirunda rustica	X	X
	Carolina Chickadee	Poecile carolinensis	X	X
	Tufted Titmouse	Baeolophus bicolor	X	X
<u>Sittidae</u>				
<u>Certhidae</u>	White-breasted Nuthatch	Sitta carolinensis	X	X
	Brown Creeper IT	Certhia americana	X	X
Troglodytid	<u>ae</u>			
	Carolina Wren	Thryothorus ludovicianus	X	X
	House Wren	Troglodytes aedon	X	X
	Winter Wren	Troglodytes troglodytes	X	X
	Sedge Wren	Cistothorus platenesis		X

Table 5. List of bird species (continued).

<u>Family</u> Subf	amily		Obse	erved
	Common Name	Scientific name	95/96	99/00
Regulidae			- 177	
	Golden-crowned Kinglet Ruby-crowned Kinglet	Regulus satrapa Regulus calendula	X X	X X
<u>Sylviidae</u> Polio	ptilinae			
<u>Turdidae</u>	Blue-gray Gnatcatcher	Polioptila caerulea	X	X
	Eastern Bluebird Veery Gray-cheeked Thrush Swainson's Thrush Hermit Thrush Wood Thrush American Robin	Sialis sialis Catharus fuscescens Catharus minimus Catharus ustulatus Catharus guttatus Hylocixhla mustelina Turdus migratorius	X X X X X X X	X X X X X X
<u>Mimidae</u>				
	Gray Catbird Northern Mockingbird Brown Thrasher	Dumetella carolinensis Mimus polyglottos Toxostoma rufum	X X	X X X
<u>Sturnidae</u>				
	European Starling IN	Sturnus vulgaris	X	X
<u>Motacillida</u>	<u>e</u>			
	American Pipit	Anthus rubescens		X
Bombycillic	<u>lae</u>			
	Cedar Waxwing	Bombycilla cedrorum	X	X

Table 5. List of bird species (continued).

Subi	amily		CDSC	erved
	Common Name	Scientific name	95/96	99/00
<u>Parulidae</u>				
	Blue-winged Warbler	Vermivora pinus	X	X
	Golden-winged Warbler WL	Vermivora chrysoptera	X	X
	Tennessee Warbler	Vermivora peregrina	X	X
	Orange-crowned Warbler	Vermivora celata	X	X
	Nashville Warbler	Vermivora ruficapilla	X	X
	Northern Parula	Parula americana	X	X
	Yellow Warbler	Dendroica petechia	X	X
	Chestnut-sided Warbler	Dendroica pensyvanica	X	X
	Magnolia Warbler	Dendroica magnolia	X	X
	Cape May Warbler	Dendroica tigrina	X	
	Yellow-rumped Warbler	Dendroica coronata	X	X
	Black-throated Green Warbler		X	X
	Blackburnian Warbler	Dendroica fusca	X	X
	Yellow-throated Warbler	Dendroica dominica	\ddot{X}	X
	Palm Warbler	Dendroica palmarum	X	X
	Bay-breasted Warbler	Dendroica castania	X	X
	Blackpoll Warbler	Dendroica striata	X	X
	Cerulian Warbler WL	Dendroica cerulea	X	X
	Black-and-white Warbler	Mniotilta varia	X	X
	American Redstart	Setophaga ruticilla	X	X
	Worm-eating Warbler	Helmitheros vermivorus	X	X
	Ovenbird	Seiurus aurocapillus	X	X
	Northern Waterthrush	Seiurus noveboracensis	X	X
	Louisiana Waterthrush	Seiurus motacilla	X	X
	Kentucky Warbler	Oporornis formosus	X	X
	Common Yellowthroat		X	X
	Wilson's Warbler	Geothlypis trichas	Λ	X
	Canada Warbler	Wilsonia pusilla Wilsonia canadensis	X	Λ
	Yellow-breasted Chat		X	X
	a chow-dicasted Chat	Icteria virens	Λ	Λ
<u> Thraupidae</u>				
	Summer Tanager	Piranga rubra	X	X
	Scarlet Tanager	Piranga olivacea	X	X

Table 5. List of bird species (concluded).

<u>Family</u> Subi	family		Obse	erved
	Common Name	Scientific name	95/96	99/00
<u>Emberizida</u>	10			
	Eastern Towhee	Pipilo erythrophthalmus	X	X
	American Tree Sparrow	Spizella arborea		X
	Chipping Sparrow	Špizella passerina	X	\mathbf{X}
	Field Sparrow	Spizella pusilla	X	X X X X
	Grasshopper Sparrow	Ammodramus savannarum		X
	Henslow's Sparrow IE	Ammodramus henslowii		X
	Fox Sparrow	Passerella iliaca	X	X
	Song Sparrow	Melospiza melodia	X	\mathbf{X}
	Swamp Sparrow	Meolspiza georgiana	X	X
	White-throated Sparrow	Zonotrichia albicollis	X	X
	White-crowned Sparrow	Zonotrichia leucophrys		X
	Dark-eyed Junco	Junco hyemalis	X	X
<u>Cardinalid</u>	<u>ae</u>			
	Northern Cardinal	Cardinalis cardinalis	X	X
	Rose-breasted Grosbeak	Pheucticus ludovicianus	X	X
	Indigo Bunting	Passerina cyanea	X	X
	Dickcissel	Spiza americana		X
<u>Icteridae</u>				
	Red-winged Blackbird	Agelaius phoeniceus	X	X
	Eastern Meadowlark	Sturnella magna	X	X
	Common Grackle	Quscalus quiscalus	X	X
	Brown-headed Cowbird	Molothrus ater	X	X
	Baltimore Oriole	Icterus galbula	X	X
<u>Fringillida</u>	<u>e</u>			
	Purple Finch	Carpodacus purpureus	X	X
	House Finch IN	Carpodacus mexicanus	X	X
	American Goldfinch	Carduelis tristis	X	X
<u>Passeridae</u>				
	House Sparrow IN	Passer domesticus	X	X

FT=Federally threatened IE=Illinois endangered IT=Illinois threatened

WL=Illinois watch-list

IN=Non-native Species

Table 6. List of bird species recorded at forested census points during the breeding season survey with mean number of birds recorded per visit at presently undisturbed sites and sites with an existing trail. A combined mean for all undisturbed sites is also given. NDP=No Development Planned; PT=Proposed Trail; PC=Proposed Campground; CM=Combined Means for presently undisturbed census points.

0.56 0.69 0.44 0.56 0.69 0.94 0.13 0.50 0.56 0.44 0.94 0.56 0.25 0.13 0.13	PC 1.75 0.75 1.00 0.75 0.25 0.50 0.50 0.50 0.25 0.50 0.00 0.0	1.07 0.74 0.71 0.63 0.56 0.52 0.49 0.47 0.45 0.45 0.45 0.29 0.26 0.24 0.20 0.18	0.60 0.95 0.50 0.35 0.60 0.22 0.35 0.30 0.60 0.40 0.40 0.25 0.10 0.40
0.69 0.44 0.56 0.69 0.94 0.13 0.50 0.56 0.44 0.94 0.56 0.25 0.13 0.19 0.19	0.75 1.00 0.75 0.25 0.50 1.00 0.50 0.50 0.25 0.00 0.25 0.25 0.25	0.74 0.71 0.63 0.56 0.52 0.49 0.47 0.45 0.45 0.45 0.45 0.29 0.26 0.24 0.20	0.95 0.50 0.35 0.60 0.20 0.25 0.35 0.30 0.60 0.40 0.40 0.25 0.10 0.40 0.55 0.15
0.44 0.56 0.69 0.94 0.13 0.50 0.56 0.44 0.94 0.56 0.25 0.13 0.19 0.19	0.75 1.00 0.75 0.25 0.50 1.00 0.50 0.50 0.25 0.00 0.25 0.25 0.25	0.74 0.71 0.63 0.56 0.52 0.49 0.47 0.45 0.45 0.45 0.45 0.29 0.26 0.24 0.20	0.95 0.50 0.35 0.60 0.20 0.25 0.35 0.30 0.60 0.40 0.40 0.25 0.10 0.40 0.55 0.15
0.56 0.69 0.94 0.13 0.50 0.50 0.56 0.44 0.94 0.56 0.25 0.13 0.19 0.19	0.75 0.25 0.50 1.00 0.50 0.50 0.25 0.50 0.00 0.25 0.25 0	0.63 0.56 0.52 0.49 0.47 0.45 0.45 0.45 0.29 0.26 0.24	0.50 0.35 0.60 0.20 0.25 0.35 0.30 0.60 0.40 0.40 0.25 0.10 0.40 0.05 0.15
0.69 0.94 0.13 0.50 0.56 0.44 0.94 0.56 0.25 0.13 0.19 0.19	0.75 0.25 0.50 1.00 0.50 0.50 0.25 0.50 0.00 0.25 0.25 0	0.63 0.56 0.52 0.49 0.47 0.45 0.45 0.45 0.29 0.26 0.24	0.35 0.60 0.20 0.25 0.35 0.30 0.60 0.40 0.40 0.25 0.10 0.40 0.05 0.15
0.94 0.13 0.50 0.50 0.56 0.44 0.94 0.56 0.25 0.13 0.19 0.19	0.50 1.00 0.50 0.50 0.25 0.50 0.00 0.25 0.25 0	0.52 0.49 0.47 0.45 0.45 0.45 0.29 0.29 0.26 0.24 0.20	0.20 0.25 0.35 0.30 0.60 0.40 0.25 0.10 0.40 0.05 0.15
0.13 0.50 0.50 0.56 0.44 0.94 0.56 0.25 0.13 0.19 0.19	1.00 0.50 0.50 0.25 0.50 0.00 0.25 0.50 0.25 0.25	0.49 0.47 0.45 0.45 0.45 0.41 0.30 0.29 0.26 0.24 0.20	0.25 0.35 0.30 0.60 0.40 0.25 0.10 0.40 0.05 0.15
0.50 0.50 0.56 0.44 0.94 0.56 0.25 0.13 0.19 0.19	0.50 0.50 0.25 0.50 0.00 0.25 0.50 0.25 0.25	0.47 0.45 0.45 0.45 0.41 0.30 0.29 0.26 0.24	0.35 0.30 0.60 0.40 0.25 0.10 0.40 0.05 0.15
0.50 0.56 0.44 0.94 0.56 0.25 0.13 0.19 0.19	0.50 0.25 0.50 0.00 0.00 0.25 0.25 0.25	0.45 0.45 0.45 0.41 0.30 0.29 0.26 0.24 0.20	0.30 0.60 0.40 0.40 0.25 0.10 0.40 0.05 0.15
0.56 0.44 0.94 0.56 0.25 0.13 0.19 0.19	0.25 0.50 0.00 0.00 0.25 0.50 0.25 0.25	0.45 0.45 0.41 0.30 0.29 0.26 0.24 0.20	0.60 0.40 0.40 0.25 0.10 0.40 0.05
0.44 0.94 0.56 0.25 0.13 0.19 0.19	0.50 0.00 0.00 0.25 0.50 0.25 0.25 0.00	0.45 0.41 0.30 0.29 0.26 0.24 0.20	0.40 0.40 0.25 0.10 0.40 0.05 0.15
0.94 0.56 0.25 0.13 0.19 0.19 0.19	0.00 0.00 0.25 0.50 0.25 0.25 0.00	0.41 0.30 0.29 0.26 0.24 0.20	0.40 0.25 0.10 0.40 0.05 0.15
0.56 0.25 0.13 0.13 0.19 0.19	0.00 0.25 0.50 0.25 0.25 0.00	0.30 0.29 0.26 0.24 0.20	0.25 0.10 0.40 0.05 0.15
0.25 0.13 0.13 0.19 0.19 0.13	0.25 0.50 0.25 0.25 0.00	0.29 0.26 0.24 0.20	0.10 0.40 0.05 0.15
0.13 0.13 0.19 0.19 0.13	0.50 0.25 0.25 0.00	$0.26 \\ 0.24 \\ 0.20$	0.40 0.05 0.15
0.13 0.19 0.19 0.13	$0.25 \\ 0.25 \\ 0.00$	$\begin{array}{c} 0.24 \\ 0.20 \end{array}$	$\begin{array}{c} \textbf{0.05} \\ \textbf{0.15} \end{array}$
0.19 0.19 0.13	$\begin{array}{c} \textbf{0.25} \\ \textbf{0.00} \end{array}$	0.20	0.15
$\begin{array}{c} 0.19 \\ 0.13 \end{array}$	0.00		
0.13		0.18	
	^ ^=		0.70
A 4 A	0.25	0.15	0.25
0.19	0.00	0.15	0.25
0.38	0.00	0.13	0.05
0.19	0.00	0.10	0.15
0.00	0.25	0.09	0.05
0.19	0.00	0.09	0.05
0.19	0.00	0.08	0.10
0.25	0.00	0.08	0.05
0.00	0.25	0.08	0.00
			0.00
			0.00
			0.10
			0.00
			0.40
			0.15
0 4 3	A A A	0.05	
$\begin{array}{c} 0.13 \\ 0.06 \end{array}$	$0.00 \\ 0.00$	0.03	$\begin{array}{c} \textbf{0.00} \\ \textbf{0.15} \end{array}$
	0.13 0.13 0.13 0.00	$\begin{array}{cccc} 0.13 & 0.00 \\ 0.13 & 0.00 \\ 0.13 & 0.00 \\ 0.13 & 0.00 \\ 0.00 & 0.00 \end{array}$	$\begin{array}{ccccc} 0.13 & 0.00 & 0.07 \\ 0.13 & 0.00 & 0.07 \\ 0.13 & 0.00 & 0.06 \\ 0.13 & 0.00 & 0.06 \\ 0.00 & 0.00 & 0.05 \end{array}$

Table 6 concluded on following page.

Table 6. List of bird species (concluded).

	Pr	Presently Undisturbed			Existing Trail
Species	NDP	PT	PC	CM	
Yellow-throated Warbler	0.00	0.13	0.00	0.04	0.10
American Goldfinch	0.06	0.06	0.00	0.04	0.15
American Robin	0.09	0.00	0.00	0.03	0.05
Nashville Warbler	0.03	0.06	0.00	0.03	0.05
Wild Turkey	0.06	0.00	0.00	0.02	0.05
Eastern Pheobe	0.00	0.06	0.00	0.02	0.00
Louisiana Waterthrush	0.00	0.06	0.00	0.02	0.10
Broad-winged Hawk	0.03	0.00	0.00	0.01	0.00
Hairy Woodpecker	0.03	0.00	0.00	0.01	0.00
Northern Flicker	0.03	0.00	0.00	0.01	0.00
Yellow-throated Vireo	0.03	0.00	0.00	0.01	0.00
Gray-cheeked Thrush	0.03	0.00	0.00	0.01	0.00
Blackburnian Warbler	0.03	0.00	0.00	0.01	0.00
Blackpoll Warbler	0.03	0.00	0.00	0.01	0.00
Worm-eating Warbler	0.03	0.00	0.00	0.01	0.00
Rose-breasted Grosbeak	0.03	0.00	0.00	0.01	0.10
Baltimore Oriole	0.03	0.00	0.00	0.01	0.10
Cooper's Hawk	0.00	0.00	0.00	0.00	0.05
east Flycatcher	0.00	0.00	0.00	0.00	0.05
Warbling Vireo	0.00	0.00	0.00	0.00	0.10
Carolina Wren	0.00	0.00	0.00	0.00	0.05
Blue-winged Warbler	0.00	0.00	0.00	0.00	0.05
Golden-winged Warbler	0.00	0.00	0.00	0.00	0.05
Cerulean Warbler	0.00	0.00	0.00	0.00	0.10
White-throated Sparrow	0.00	0.00	0.00	0.00	0.25
OVERALL MEAN	9.63	11.06	11.00	10.23	10.30
TOTAL SPECIES	45	36	19	53	45

Table 7. List of bird species recorded at edge census points during the breeding season survey with mean number of birds recorded per visit. A mean for all undisturbed sites is also given. NDP=No Development Proposed; PT=Proposed Trail; CM=Combined Mean.

Species	PT	NDP	СМ
Field Sparrow	1.32	2.00	1.66
Indigo Bunting	1.14	1.38	1.26
Red-winged Blackbird	0.86	1.38	1.12
Common Yellowthroat	0.82	0.88	0.85
Henslow's Sparrow	0.18	1.00	0.59
House Wren	0.18	0.75	0.46
Northern Cardinal	0.46	0.13	0.29
Gray Catbird	0.07	0.50	0.29
Brown-headed Cowbird	0.25	0.25	0.25
American Robin	0.11	0.38	0.24
Eastern Wood-pewee	0.32	0.13	0.22
Eastern Towhee	0.32	0.13	0.22
American Goldfinch	0.29	0.13	0.21
Great Crested Flycatcher	0.25	0.13	0.19
Blue-gray Gnatcatcher	0.36	0.00	0.18
Blue Jay	0.21	0.13	0.17
Eastern Bluebird	0.07	0.25	0.16
Red-bellied Woodpecker	0.18	0.13	0.15
Carolina Chickadee	0.18	0.13	0.15
Hairy Woodpecker	0.00	0.25	0.13
Downy Woodpecker	0.21	0.00	0.11
Yellow-rumped Warbler	0.21	0.00	0.11
Yellow-breasted Chat	0.04	0.13	0.08
Rose-breasted Grosbeak	0.04	0.13	0.08
White-eyed Vireo	0.14	0.00	0.07
Warbling Vireo	0.14	0.00	0.07
Acadian Flycatcher	0.00	0.13	0.06
Kentucky Warbler	0.00	0.13	0.06
Eastern Meadowlark	0.00	0.13	0.06
Yellow-billed Cuckoo	0.11	0.00	0.05
Ruby-throated Hummingbird		0.00	0.05
Northern Flicker	0.11	0.00	0.05
White-breasted Nuthatch	0.11	0.00	0.05
Northern Parula	0.11	0.00	0.05
Scarlet Tanager	0.11	0.00	0.05
Red-headed Woodpecker	0.07	0.00	0.04
Eastern Kingbird	0.07	0.00	0.04

Table 7 concluded on following page.

Table 7. List of bird species recorded at edge census points during the breeding season (Concluded).

Species	NDP	NT	CM
Red-eyed Vireo	0.07	0.00	0.04
Tufted Titmouse	0.07	0.00	0.04
Palm Warbler	0.07	0.00	0.04
Black and White Warbler	0.07	0.00	0.04
Song Sparrow	0.07	0.00	0.04
Baltimore Oriole	0.07	0.00	0.04
Belted Kingfisher	0.04	0.00	0.02
Pileated Woodpecker	0.04	0.00	0.02
Alder Flycatcher	0.04	0.00	0.02
Least Flycatcher	0.04	0.00	0.02
Yellow-throated Vireo	0.04	0.00	0.02
Orange-crowned Warbler	0.04	0.00	0.02
Nashville Warbler	0.04	0.00	0.02
Chestnut-sided Warbler	0.04	0.00	0.02
Yellow-throated Warbler	0.04	0.00	0.02
Blackpoll Warbler	0.04	0.00	0.02
Ovenbird	0.04	0.00	0.02
Louisiana Waterthrush	0.04	0.00	0.02
OVERALL MEAN	10.00	10.63	10.31
TOTAL SPECIES	51	24	55

Table 8. List of bird species recorded at oldfield census points during the breeding season survey with mean number of birds recorded per visit. OHP=Oldfield Habitat Planted to trees.

Species	ОНР	
Ni-miliona Dalambia	0.04	
Northern Bobwhite	0.04	
American Robin	0.11	
Field Sparrow	1.86	
Red-winged Blackbird	1.89	
Common Yellowthroat	1.21	
Indigo Bunting	1.11	
Dickcissel	0.32	
Henslow's Sparrow	0.21	
Eastern Meadowlark	0.14	
Song Sparrow	0.14	
Northern Cardinal	0.04	
Yellow-breasted Chat	0.11	
Brown-headed Cowbird	0.04	
American Goldfinch	0.04	
OVERALL MEAN	7.25	
TOTAL SPECIES	14	

Table 9. List of bird species recorded at the wetland census point during the breeding season survey with mean number of birds recorded per visit. WC=Wetland Creation

Species	wc
Red-winged Blackbird	3.75
Dickcissel	1.25
Common Yellowthroa	- '
Grasshopper Sparrow	
Song Sparrow	0.50
Yellow-billed Cuckoo	
Brown Thrasher	0.25
Indigo Bunting	0.25
OVERALL MEAN TOTAL SPECIES	7.75 8

Table 10. List of bird species recorded at forested census points during the fall season survey with mean number of birds recorded per visit at presently undisturbed sites and sites with an existing trail. A combined mean for all undisturbed sites is also given. NDP=No Development Planned; PT=Proposed Trail; PC=Proposed Campground; CM=Combined Means for presently undisturbed census points.

	Presently Undisturbed			Existing Trail	
Species	NDP	PT	PC	CM	
Red-bellied Woodpecker	1.06	0.88	1.50	1.15	0.45
Blue Jay	0.84	0.88	1.00	0.91	0.90
Carolina Chickadee	0.78	0.88	0.75	0.80	0.85
White-breasted Nuthatch	0.78	0.50	0.75	0.68	0.70
Eastern Wood-pewee	0.31	0.38	0.50	0.40	0.25
American Robin	0.28	0.38	0.50	0.39	0.35
Downy Woodpecker	0.34	0.25	0.50	0.36	0.30
Red-headed Woodpecker	0.31	0.56	0.00	0.29	0.70
Northern Cardinal	0.09	0.19	0.50	0.26	0.15
Acadian Flycatcher	0.16	0.06	0.50	0.24	0.05
Tufted Titmouse	0.28	0.06	0.25	0.20	0.05
Gray Catbird	0.00	0.13	0.25	0.13	0.05
American Crow	0.13	0.13	0.00	0.08	0.05
Carolina Wren	0.06	0.13	0.00	0.06	0.15
Eastern Towhee	0.00	0.19	0.00	0.06	0.00
Dark-eyed Junco	0.13	0.06	0.00	0.06	0.00
American Redstart	0.03	0.13	0.00	0.05	0.05
White-eyed Vireo	0.00	0.13	0.00	0.04	0.00
Chestnut-sided Warbler	0.06	0.06	0.00	0.04	0.05
Cellow-throated Vireo	0.03	0.06	0.00	0.03	0.00
Black and White Warbler	0.03	0.06	0.00	0.03	0.00
Cooper's Hawk	0.00	0.06	0.00	0.02	0.00
ellow-bellied Sapsucker	0.00	0.06	0.00	0.02	0.05
łairy Woodpecker	0.06	0.00	0.00	0.02	0.05
Brown Creeper	0.06	0.00	0.00	0.02	0.00
Brown Thrasher	0.00	0.06	0.00	0.02	0.00
Aagnolia Warbler	0.00	0.06	0.00	0.02	0.05
Brown-headed Cowbird	0.00	0.06	0.00	0.02	0.00
led-tailed Hawk	0.03	0.00	0.00	0.01	0.00
ileated Woodpecker	0.03	0.00	0.00	0.01	0.05
Great Crested Flycatcher	0.03	0.00	0.00	0.01	0.00
Red-eyed Vireo	0.03	0.00	0.00	0.01	0.00
Iouse Wren	0.03	0.00	0.00	0.01	0.00
Gray-cheeked Thrush	0.03	0.00	0.00	0.01	0.00
carlet Tanager	0.03	0.00	0.00	0.01	0.00
ose-breasted Grosbeak	0.03	0.00	0.00	0.01	0.00
Vild Turkey	0.00	0.00	0.00	0.00	0.05

Table 10 concluded on following page.

Table 10. List of bird species recorded at forested census points during the fall season survey (concluded).

	Presently Undisturbed				Existing Trail	
Species	NDP	PT	PC	CM		
Golden-crowned Kinglet	0.00	0.00	0.00	0.00	0.10	
Swainson's Thrush	0.00	0.00	0.00	0.00	0.05	
Wood Thrush	0.00	0.00	0.00	0.00	0.05	
Golden-winged Warbler	0.00	0.00	0.00	0.00	0.05	
Tennessee Warbler	0.00	0.00	0.00	0.00	0.05	
Nashville Warbler	0.00	0.00	0.00	0.00	0.05	
Northern Parula	0.00	0.00	0.00	0.00	0.05	
Black-throated Green Warbler	0.00	0.00	0.00	0.00	0.10	
Common Yellowthroat	0.00	0.00	0.00	0.00	0.05	
White-throated Sparrow	0.00	0.00	0.00	0.00	0.05	
OVERALL MEAN	6.09	6.38	7.00	6.49	 5.95	
TOTAL SPECIES	28	26	12	36	31	

Table 11. List of bird species recorded at edge census points during the fall season survey with mean number of birds recorded per visit. A combined mean for all sites is also given. NDP=No Development Proposed; PT=Proposed Trail; CM=Combined Mean.

Species	PT	NDP	CM
Dark-eyed Junco	0.00	1.25	0.63
Blue Jay	0.46	0.38	0.42
Northern Cardinal	0.43	0.38	0.40
American Redstart	0.04	0.63	0.33
Carolina Chickadee	0.36	0.25	0.30
Red-bellied Woodpecker	0.61	0.00	0.30
Downy Woodpecker	0.25	0.25	0.25
White-breasted Nuthatch	0.36	0.13	0.24
Gray Catbird	0.29	0.13	0.21
Eastern Wood-pewee	0.39	0.00	0.20
Cedar Waxwing	0.39	0.00	0.20
Red-winged Blackbird	0.07	0.25	0.16
Common Yellowthroat	0.32	0.00	0.16
Field Sparrow	0.14	0.13	0.13
Red-headed Woodpecker	0.25	0.00	0.13
Tufted Titmouse	0.18	0.00	0.09
Great Crested Flycatcher	0.04	0.13	0.08
White-throated Sparrow	0.04	0.13	0.08
American Robin	0.14	0.00	0.07
Blackpoll Warbler	0.00	0.13	0.06
Indigo Bunting	0.11	0.00	0.05
Wild Turkey	0.07	0.00	0.04
Carolina Wren	0.07	0.00	0.04
House Wren	0.07	0.00	0.04
Black and White Warbler	0.07	0.00	0.04
Eastern Towhee	0.07	0.00	0.04
American Tree Sparrow	0.07	0.00	0.04
Dickcissel	0.07	0.00	0.04
American Goldfinch	0.07	0.00	0.04
Least Flycatcher	0.04	0.00	0.02
White-eyed Vireo	0.04	0.00	0.02
Warbling Vireo	0.04	0.00	0.02
Red-eyed Vireo	0.04	0.00	0.02
Nashville Warbler	0.04	0.00	0.02
Chestnut-sided Warbler	0.04	0.00	0.02
Magnolia Warbler	0.04	0.00	0.02

Table 11 concluded on following page.

Table 11. List of bird species recorded at edge census points during the fall season survey (concluded).

Species	PT	NDP	СМ
Yellow-rumped Warbler	0.04	0.00	0.02
Black-throated Green Warbler	0.04	0.00	0.02
Wilson's Warbler	0.04	0.00	0.02
Scarlet Tanager	0.04	0.00	0.02
Song Sparrow	0.04	0.00	0.02
OVERALL MEAN	5.86	4.13	4.99
TOTAL SPECIES	39	13	41

Table 12. List of bird species recorded at oldfield census points during the fall season survey with mean number of birds recorded per visit. OHP=Oldfield Habitat Planted to trees.

Species	ОНР	
Song Sparrow	0.32	
American Goldfinch	0.29	
Carolina Chickadee	0.18	
Field Sparrow	0.18	
Indigo Bunting	0.14	
Common Yellowthroat	0.11	
White-throated Sparrow	0.11	
White-crowned Sparrow	0.11	
American Tree Sparrow	0.07	
Swamp Sparrow	0.07	
Red-winged Blackbird	0.07	
Ruby-throated Hummingbird	0.04	
Red-headed Woodpecker	0.04	
Downy Woodpecker	0.04	
Blue Jay	0.04	
Tufted Titmouse	0.04	
Sedge Wren	0.04	
Orange-crowned Warbler	0.04	
Northern Cardinal	0.04	
Eastern Meadowlark	0.04	
OVERALL MEAN	1.96	
TOTAL SPECIES	20	

Table 13. List of bird species recorded at the wetland census point during the fall season survey with mean number of birds recorded per visit. WC=Wetland Creation

Species	wc	
Song Sparrow	0.75	
Swamp Sparrow	0.75	
Northern Harrier	0.25	
House Wren	0.25	
Common Yellowthroat	0.25	
Field Sparrow	0.25	
Indigo Bunting	0.25	
American Goldfinch	0.25	
OVERALL MEAN	3.00	
TOTAL SPECIES	8	

Table 14. List of bird species recorded at forested census points during the winter season survey with mean number of birds recorded per visit at presently undisturbed sites and sites with an existing trail. A combined mean for all undisturbed sites is also given. NDP=No Development Planned; PT=Proposed Trail; PC=Proposed Campground; CM=Combined Means for presently undisturbed census points

	Presently Undisturbed				Existing Trail
Species	NDP	PT	PC	СМ	
Red-bellied Woodpecker	0.88	0.63	1.50	1.00	0.40
Carolina Chickadee	0.50	0.63	1.00	0.71	1.30
Blue Jay	0.63	0.88	0.50	0.67	0.60
White-breasted Nuthatch	0.50	1.00	0.50	0.67	0.50
Red-headed Woodpecker	0.31	1.50	0.00	0.60	0.50
Tufted Titmouse	0.38	0.63	0.00	0.33	0.40
Downy Woodpecker	0.50	0.25	0.00	0.25	0.50
Northern Cardinal	0.19	0.13	0.00	0.10	0.10
Yellow-bellied Sapsucker	0.25	0.00	0.00	0.08	0.00
Sharp-shinned Hawk	0.06	0.00	0.00	0.02	0.00
Hairy Woodpecker	0.06	0.00	0.00	0.02	0.00
American Crow	0.06	0.00	0.00	0.02	0.00
Carolina Wren	0.06	0.00	0.00	0.02	0.00
American Goldfinch	0.06	0.00	0.00	0.02	0.00
Bared Owl	0.00	0.00	0.00	0.00	0.10
Pileated Woodpecker	0.00	0.00	0.00	0.00	0.10
OVERALL MEAN	4.44	5.63	3.50	4.52	4.50
TOTAL SPECIES	14	8	4	14	10

Table 15. List of bird species recorded at edge census points during the winter season survey with mean number of birds recorded per visit. A mean for all sites is also given. NDP=No Development Proposed; PT=Proposed Trail; CM=Combined Mean.

Species	PT	NDP	CM
American Tree Sparrow	1.43	0.25	0.84
Blue Jay	0.57	1.00	0.79
Carolina Chickadee	0.64	0.75	0.70
Northern Cardinal	0.43	0.75	0.59
White-breasted Nuthatch	0.64	0.50	0.57
Downy Woodpecker	0.57	0.25	0.41
European Starling	0.00	0.75	0.38
Red-bellied Woodpecker	0.57	0.00	0.29
Tufted Titmouse	0.07	0.50	0.29
Northern Flicker	0.00	0.25	0.13
Red-headed Woodpecker	0.14	0.00	0.07
Pileated Woodpecker	0.07	0.00	0.04
Dark-eyed Junco	0.07	0.00	0.04
TOTAL	5.21	5.00	5.11
TOTAL SPECIES	11	9	13

Table 16. List of bird species recorded at oldfield census points during the winter season survey with mean number of birds recorded per visit. OHP=Oldfield Habitat Planted to trees.

Species	ОНР	
Northern Cardinal	0.29	·
Song Sparrow	0.21	
Sharp-shinned Hawk	0.07	
Red-headed Woodpecker	0.07	
Red-bellied Woodpecker	0.07	
OVERALL MEAN	0.71	
TOTAL SPECIES	5	

Table 17. List of bird species recorded at the wetland census point during the winter season survey with mean number of birds recorded per visit. WC=Wetland Creation

:	Species	WC	
	Red-headed Woodpecker	3.00	
	White-breasted Nuthatch	1.50	
	Downy Woodpecker	1.00	
	Blue Jay	1.00	
1	Carolina Chickadee	1.00	
	Red-bellied Woodpecker	0.50	
ı	Tufted Titmouse	0.50	
	Song Sparrow	0.50	
	Northern Cardinal	0.50	
	OVERALL MEAN	9.50	<u></u>
i	TOTAL SPECIES	9	

Table 18. List of bird species recorded at forested census points during the spring season survey with mean number of birds recorded per visit at presently undisturbed sites and sites with an existing trail. A combined mean for all undisturbed sites is also given. NDP=No Development Planned; PT=Proposed Trail; PC=Proposed Campground; CM=Combined Means for presently undisturbed census points

	P	resently	Undistur	bed	Existing Trail
Species	NDP	PT	PC	CM	
Tufted Titmouse	0.44	0.88	1.50	0.94	0.40
Brown-headed Cowbird	0.50	1.00	1.00	0.83	0.10
American Robin	0.38	0.38	1.00	0.58	0.20
Red-headed Woodpecker	0.31	0.88	0.00	0.40	0.40
White-breasted Nuthatch	0.31	0.38	0.50	0.40	0.40
Red-bellied Woodpecker	0.75	0.38	0.00	0.38	0.20
European Starling	0.19	0.88	0.00	0.35	0.20
Downy Woodpecker	0.75	0.25	0.00	0.33	0.50
Eastern Towhee	0.00	0.50	0.50	0.33	0.00
Yellow-bellied Sapsucker	0.06	0.25	0.50	0.27	0.20
Blue Jay	0.25	0.38	0.00	0.21	0.30
Yellow-rumped Warbler	0.13	0.50	0.00	0.21	0.20
Carolina Chickadee	0.25	0.25	0.00	0.17	0.50
Northern Cardinal	0.19	0.25	0.00	0.15	0.70
Golden-crowned Kinglet	0.19	0.13	0.00	0.10	0.80
Eastern Pheobe	0.13	0.13	0.00	0.08	0.00
Ruby-crowned Kinglet	0.00	0.25	0.00	0.08	0.20
Song Sparrow	0.00	0.25	0.00	0.08	0.00
Red-tailed Hawk	0.06	0.13	0.00	0.06	0.00
Northern Flicker	0.00	0.13	0.00	0.04	0.00
Winter Wren	0.00	0.13	0.00	0.04	0.10
Hermit Thrush	0.00	0.13	0.00	0.04	0.10
Brown Thrasher	0.00	0.13	0.00	0.04	0.00
Louisiana Waterthrush	0.13	0.00	0.00	0.04	0.00
Field Sparrow	0.00	0.13	0.00	0.04	0.00
Red-winged Blackbird	0.00	0.13	0.00	0.04	0.00
Pileated Woodpecker	0.06	0.00	0.00	0.02	0.00
Black and White Warbler	0.06	0.00	0.00	0.02	0.00
American Crow	0.00	0.00	0.00	0.00	0.30
Brown Creeper	0.00	0.00	0.00	0.00	0.30
OVERALL MEAN FOTAL SPECIES	5.13 19	8.75 25	5.00 6	6.29 28	6.10 19

Table 19. List of bird species recorded at edge census points during the spring season survey with mean number of birds recorded per visit. A mean for all undisturbed sites is also given. NDP=No Development Proposed; PT=Proposed Trail; CM=Combined Mean.

Species	PT	NDP	CM
Field Sparrow	0.57	0.75	0.66
Northern Cardinal	0.57	0.75	0.66
Red-winged Blackbird	0.64	0.50	0.57
Eastern Bluebird	0.07	0.75	0.41
Tufted Titmouse	0.43	0.25	0.34
Red-bellied Woodpecker	0.36	0.25	0.36
Blue Jay	0.36	0.25	0.30
Brown-headed Cowbird	0.36	0.25	0.30
White-breasted Nuthatch	0.07	0.50	0.29
Golden-crowned Kinglet	0.07	0.50	0.29
Downy Woodpecker	0.29	0.25	0.27
White-throated Sparrow	0.00	0.50	0.25
Ruby-crowned Kinglet	0.21	0.25	0.23
Mourning Dove	0.14	0.25	0.20
Brown Thrasher	0.14	0.25	0.20
European Starling	0.07	0.25	0.1
American Robin	0.29	0.00	0.14
Eastern Pheobe	0.00	0.25	0.13
Fox Sparrow	0.21	0.00	0.13
Red-headed Woodpecker	0.14	0.00	0.0
Carolina Chickadee	0.14	0.00	0.0
Eastern Towhee	0.14	0.00	0.0
Song Sparrow	0.14	0.00	0.0
American Woodcock	0.07	0.00	0.04
Yellow-bellied Sapsucker	0.07	0.00	0.04
Hairy Woodpecker	0.07	0.00	0.04
Northern Flicker	0.07	0.00	0.04
Brown Creeper	0.07	0.00	0.04
Carolina Wren	0.07	0.00	0.04
Louisiana Waterthrush	0.07	0.00	0.04
American Tree Sparrow	0.07	0.00	0.04
OVEDALI MEAN	<i>د</i> ۵۵	675	6.38
OVERALL MEAN TOTAL SPECIES	6.00 29	6.75 17	6.3

Table 20. List of bird species recorded at oldfield census points during the spring season survey with mean number of birds recorded per visit. OHP=Oldfield Habitat Planted to trees.

Species	ОНР
Red-winged Blackbird	1.14
Field Sparrow	0.64
Song Sparrow	0.29
Northern Cardinal	0.21
Blue Jay	0.14
Eastern Bluebird	0.07
Brown Thrasher	0.07
Brown-headed Cowbird	0.07
OVERALL MEAN	2.64
TOTAL SPECIES	8

Table 21. List of bird species recorded at the wetland census point during the spring season survey with mean number of birds recorded per visit. WC=Wetland Creation

	Species	WC	
	Red-winged Blackbird	4.00	
•	Common Snipe	1.50	
!	Song Sparrow	1.00	
· · · · · · · · · · · · · · · · · · ·	Swamp Sparrow	0.50	
:	OVERALL MEAN	7.00	
i	TOTAL SPECIES	4	

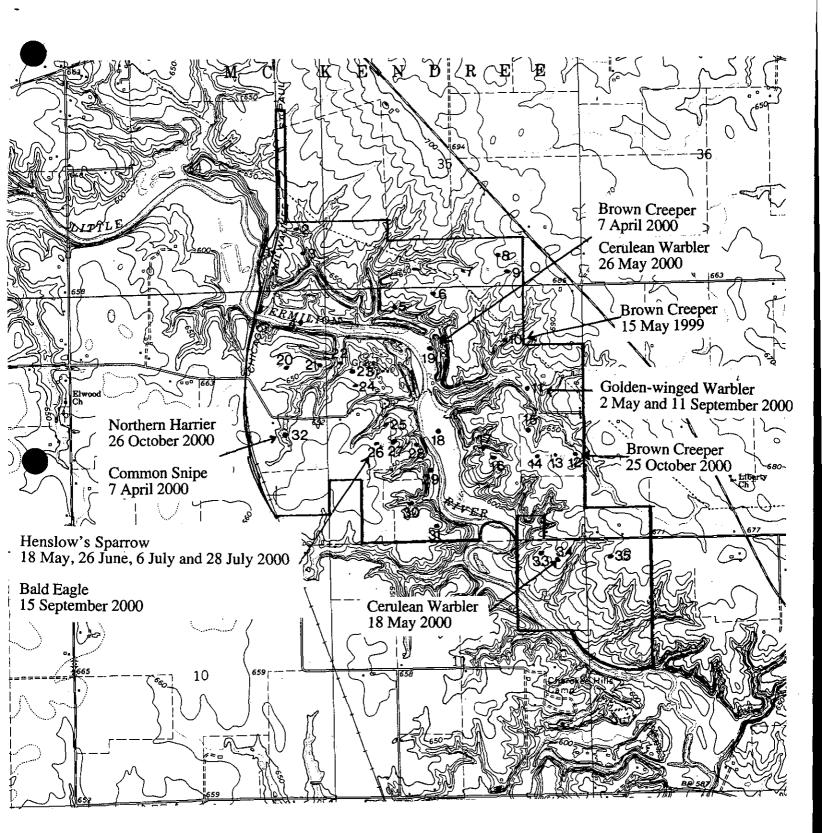


Figure 1. Map of the Babe Woodyard State Natural Area, Vermilion County, Illinois showing location of census points used during the 1999/2000 avian survey and of sighting points of listed bird species.

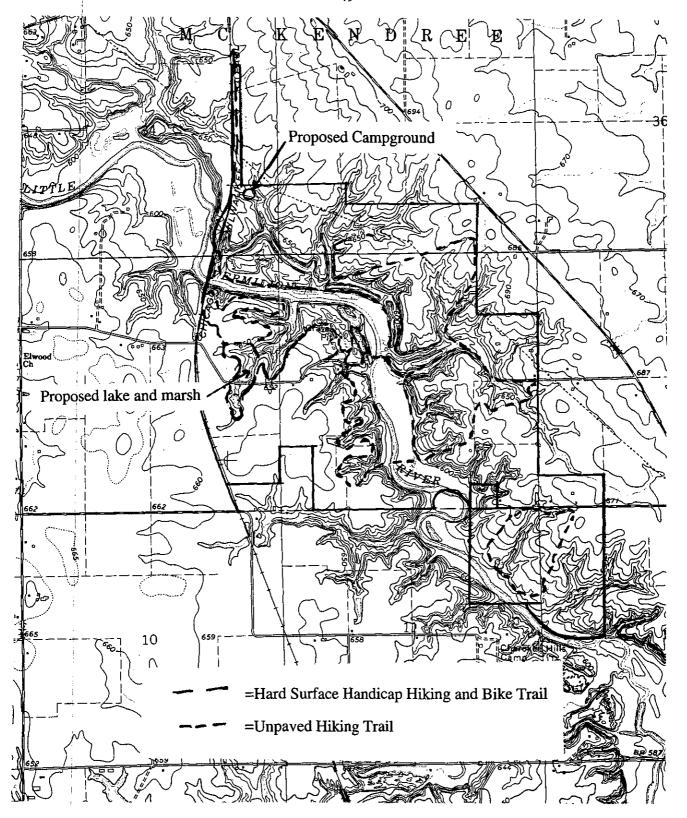


Figure 2. Map of the Babe Woodyard State Natural Area, Vermilion County, Illinois showing locations of proposed trail system, campground, lake and marsh.

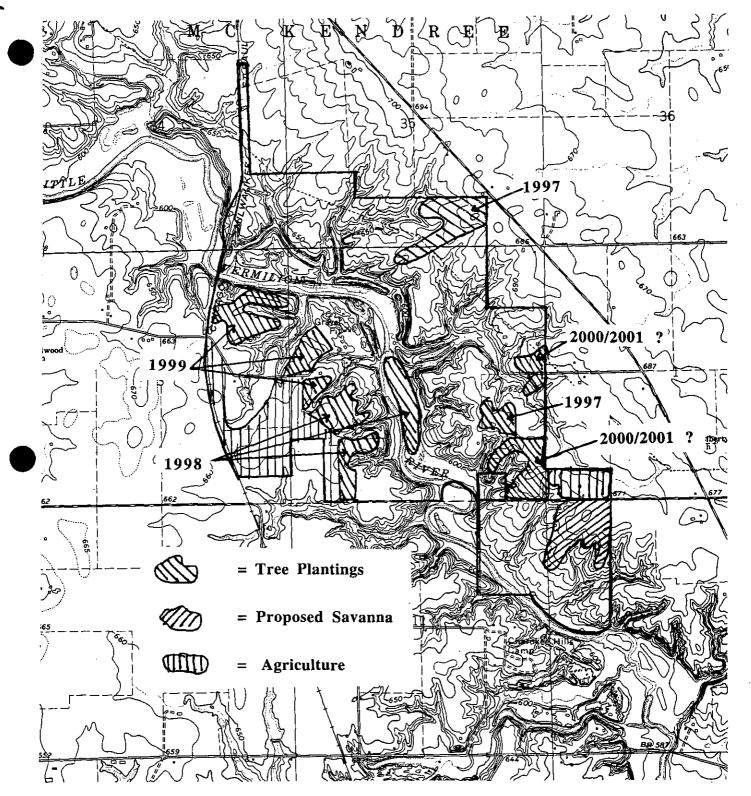


Figure 3. Map of the Babe Woodyard State Natural Area, Vermilion County, Illinois showing location of agricultural row crop fields that will be continued in production and of fields designated for reforestation. Dates are year in which trees were planted.

Appendix A. Results of the timed seasonal censuses conducted at the Babe Woodyard State Natural Area, Vermilion County, Illinois.

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