02-L04W

Monitoring Grassland Birds at Pyramid State Park, Perry County, Illinois

Duration of Research: 1 January to 30 September 2002

Location of Research: Pyramid State Park grassland complex, Perry County, Illinois

Annual Report to IDNR

By:

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INTRODUCTION

A primary goal of Conservation Biology is to gain an understanding of how human-induced alterations of the landscape influence the residual biotic communities (Soulé 1986, Wiens 1996). A related goal includes the documentation of these influences with appropriate research and the subsequent prioritization of conservation efforts aimed at reducing or ameliorating any negative effects. Loss of habitat is often thought of as the primary factor contributing to wildlife population declines and may be the greatest threat to present day wildlife populations (Illinois Wildlife Habitat Commission 1985). A related form of landscape alteration, habitat fragmentation, has also become a leading conservation issue (Wilcove et al. 1998). A vast amount of research has been directed at determining both local and regional effects of fragmentation on populations of organisms in the remnant habitat patches.

The fragmentation of habitat results in a reduction of habitat, patchiness of habitat, and isolation of remnant habitat patches from each other. The resulting landscape, particularly the land-use in the matrix surrounding the remaining habitat, can have a profound influence on those organisms remaining in remnant patches. The landscape in the Midwest region of the United States comprises small fragments of native habitat embedded within a matrix of land use that is predominated by agriculture and urban development. Some habitats have been especially hard hit. Native grasslands east of the Mississippi River have been reduced by over 90%, with regional estimates often exceeding 99% (Noss et al. 1995). In Illinois, there is less than 1% of the original native prairie/grassland habitat remaining (Schwegman 1983), and that habitat that remains is typically in small (<50 acres) isolated patches.

The loss and fragmentation of grassland/prairie habitat has been blamed, in part, for the long-term population declines of several species of grassland-dependent birds (Askins 2000).

Results from Breeding Bird Survey routes located east of the Mississippi River indicate that since 1966, the abundance of an overwhelming majority of species of grassland and savanna birds in eastern North America has fallen (Askins 1993, Sauer et al. 2001). Some examples of those species suffering the largest decreases in abundance include the Henslow's Sparrow (scientific names given in Tables 2 and 3), Grasshopper Sparrow, Eastern Meadowlark, Short-eared Owl and Dickcissel. These declines have been attributed to a combination of habitat loss (of native and non-native grassland) (Herkert 1991a, Warner 1994), as well as factors associated with habitat fragmentation (e.g., increased rates of nest predation and brood parasitism, area sensitivity). When grasslands are fragmented by non-grassland land use (e.g., row-crop agriculture, urban development), the remaining tracts of grassland habitat may be too small and some species of bird may become absent or less abundant ("area sensitivity"; Herkert 1994a, b; Vickery 1994). These fragmented grasslands may further act as "ecological traps" for those songbirds that still attempt to breed there because they may harbor large populations of nest predators and brood parasitic cowbirds (Johnson and Temple 1990). Nesting success of many species of grassland bird may be so low in fragmented landscapes that it is unlikely that their populations could be self-sustaining. An additional difficulty facing grassland birds is that many species are habitat specialists having preferences for a particular vegetation height and/or density (Herkert 1991b, Skinner et al. 1984). These preferences necessitate management of vast areas of grassland habitat as a mosaic of patches of grassland in different stages of recovery from disturbance in order to support the greatest diversity of grassland species.

Despite the loss of over 99% of the native grassland habitat in Illinois, there are currently 2 programs that result in the creation of grassland habitat. These are the Conservation Reserve Program (CRP) and surface coal mine reclamation. CRP has converted much cropland to

grassland habitat (Best et al. 1997), but the program is federally sponsored and affected by politics, with no guarantee that the grassland that is created under the auspices of CRP will remain as grassland habitat in perpetuity. Surface coal mine reclamation is less well-known, but has produced thousands of hectares of grassland habitat in portions of Illinois, Indiana, and Kentucky (Brothers 1990). Recently, studies in Indiana have demonstrated the potential importance of grassland habitats associated with reclaimed surface coal mines for grassland-dependent birds (DeVault et al. 2002). The recent acquisition of a reclaimed mine by the Illinois Department of Natural Resources is also an example of a large site with the potential to benefit grassland-dependent birds and wildlife.

The Ark Land complex in Perry County, Illinois consists of approximately 17,000 acres of mined lands that are in the process of being restored to a matrix of grasslands, shrublands, wetlands, lakes, ponds, pastures, and agricultural fields. The IDNR acquisition of the Ark Land complex was completed in 2001, and the land was added to Pyramid State Park (PSP) creating the largest IDNR site in the state. The Pyramid State Park grassland complex (hereafter referred to as PSP) contains several thousand acres of grassland habitat, making it one of the largest grassland complexes in the state of Illinois. The potential for grassland wildlife on this site is tremendous but only limited information on the species currently using the site is available. Numerous avian species of special concern, including several state listed species, may occur at the site. Surveys of the bird community on the site would document avian use of the PSP complex and identify areas on the site that contain species of special concern. IDNR personnel could use the information obtained during these surveys to assist with the continued development and implementation of the management plan for the complex. In addition, as different management practices are applied to the grasslands at PSP (e.g., prescribed burning, grazing,

removal of autumn olive, etc.), the response of the bird community to the management could be documented. This would provide vital information for the managers at the site, would be one measure of the success of the grassland restoration effort, and the results would be applicable to other sites throughout the state that are being managed as grassland ecosystems. In addition, information on the bird community present prior to the completion and implementation of a management plan for the site provides the unique opportunity to document the response of the bird community to the management occurring on the site.

The specific objectives of this research were:

(1) To conduct an avian survey at the Pyramid State Park grassland complex, Perry County, Illinois to document all species utilizing the site during the breeding season and winter.

(2) Identify any state listed species and the habitats that they are using, and document any unusually high concentrations of grassland birds present within the complex.

(3) Submit all sightings and confirmed breeding by state listed species at PSP to the Natural Heritage Database by the completion of the project.

(4) Complete a report summarizing the presence, abundance and distribution of birds in the PSP grassland complex.

METHODS

The bird community in the Ark Land complex was surveyed during the breeding season (late April-July 2003) and during the winter (January-March 2003). Two bird survey methods were used during the breeding season including 5-minute roadside point counts and off-road line

transects (Bibby et al. 1992). An extensive network of roads (paved and unpaved) is distributed throughout the grassland complex providing access to most areas within the three primary units of the park (Captain, Denmark, and Galum; see Figs. 1-3). I established 153 points along these roads, distributing the points at ≥300m intervals (point locations given in Figs. 1-3). Counts were confined to a 6-hour period beginning at sunrise on days with little wind and no rain. I stopped at each census point for 5 minutes and recorded all of the birds present within 100m. For each bird detected, I recorded species, mode of detection (song, call, or visual), and the direction of the individual from the center of the census point. Each 100-m radius census point represents approximately 3.14 hectares of area and results from the point count surveys are given as the number of individuals per hectare for each species. Data from point counts provide estimates of densities for each species and are the most useful data for documenting changes in abundance over time (as points are revisited in subsequent years). The percentage occurrence (number of census points a species was detected at/total number of census points) was determined for each species as an index of how widespread each species was over the entire site. A GPS unit (GARMIN GPS V) was used to document the location of each census point within the complex, so that points can be easily located and surveyed in the future. A qualitative description of the habitat at each census point was also recorded (with assistance from T. Esker) and these descriptions are given in Table 1.

A line-transect method was also used during the breeding season to survey the birds present in areas far-removed from any of the roads. A second observer walked through each numbered section of property that is now a part of the Pyramid State Park grassland complex. This observer recorded all birds detected while walking through each section, and also documented the amount of time spent surveying birds. This information was then used to

determine the number of individuals seen per unit time (hour) of observer effort, similar to how Spring Bird Counts are summarized. These values provide an additional baseline of information and allow for between-year comparisons with data collected in a similar fashion in the future to look for relative (qualitative) changes in numbers for each species. Most birds counted during the breeding season were singing and therefore adult males. However, detections by sight or call note likely included some females, especially for conspicuous species such as the Red-winged Blackbird and the Eastern Meadowlark, so I report count data as "individuals" per hectare or hour.

I tested whether the relative densities of 24 species (the most common grassland specialist, grassland associated and successional scrub species) recorded at roadside points were correlated with relative abundances along transects. For each of the 24 species, the density given in Table 2 was compared with the number seen per hour given in Table 3. A highly significant correlation between the values would indicate that the roadside point counts accurately characterize relative abundance relationships among the breeding bird assemblage of this habitat (DeVault et al. 2002).

During the winter, surveys were conducted similar to Christmas Bird Counts. Myself and one other observer covered all areas of the PSP grassland complex by driving roads and walking through sections. We recorded all birds detected (via observation or vocalization) as well as the number of hours spent surveying the site. The number of individuals seen per unit of observation time (walking plus driving) was documented for each species. As with the breeding season surveys, these values provide a baseline and also allow for between-year comparisons with data collected in a similar manner in the future.

Locations (date, township, range, and section) of all birds classified as endangered or threatened in Illinois were documented. The information was then submitted to the Endangered Species Protection Board in Illinois, and is also summarized in Table 4 in this report.

RESULTS

Habitat. The habitat was described at 153 census points distributed throughout the PSP grassland complex (Table 1). The points listed in Table 1 correspond to census points shown in Figures 1-3. The habitat structure and composition was diverse. In a general sense, the prevailing habitat on the site falls into two categories: grassland and successional scrub. Grassland habitat typically included one or more of the following plant species as a dominant component: fescue; brome; broom sedge; annual weeds including boneset, goldenrod, cheatgrass, sunflower, and foxtail; tall grass prairie including big blue stem and Indian grass; and areas of pasture. Tree plantings and autumn olive thickets represent the major forms of woody encroachment that constitute the successional scrub habitat. If left unmanaged, the woody encroachment will lead to the conversion of the grasslands to a scrub-shrub and eventually forested complex over time. Areas of row-crop agriculture were scattered throughout the site including corn, wheat, soybeans, and no-till soybeans. Hundreds of acres of open water exist on the site, with much of it surrounded by narrow bands of phragmites.

Breeding Season. A diverse assemblage of birds was recorded on the PSP grassland complex during the breeding season. In total, 90 species were documented, with 65 species recorded during the roadside point counts and 81 during the transect counts. The densities of species on roadside point counts (individuals/hectare) and on-foot transects (individuals/hour)

were highly positively correlated (r=0.975, N=24 species, P<0.0001). This indicates that the roadside point counts accurately portrayed the breeding bird community throughout the entire complex, especially for those species that are common. Red-winged Blackbirds were the most abundant species on the site, and were also the most widely distributed (Table 2). An additional seven species were also present throughout much of the site (i.e., >40% occurrence) including American Goldfinch, Eastern Meadowlark, Indigo Bunting, Dickcissel, Northern Bobwhite, Mourning Dove, and Common Yellowthroat. Twenty-nine species were uncommon or very narrowly distributed and were recorded at <5% of the census points (Table 2). Most of these species were uncommon because they are typically associated with a non-grassland/shrubland habitat feature (e.g., human structures for Barn Swallows and Eastern Phoebes, a stream for Belted Kingfishers, woody fence rows or forest for woodpeckers, etc). Game birds that were abundant on the site include Northern Bobwhite, Mourning Dove, Mallard, and Canada Goose (Table 2). In general, the two prominent bird communities that exist on the site are grassland and successional scrub, mirroring the prevailing habitat types.

Grassland Birds. Several grassland specialists or grassland-associated species were common on the site (Tables 2 and 3). This includes substantial numbers for some of the species that have undergone significant population decreases throughout the eastern United States in recent decades including the Eastern Meadowlark, Dickcissel, Northern Bobwhite, and Grasshopper and Henslow's Sparrows. Because census points were systematically placed throughout the site, they are a fairly unbiased sample and are representative of the birds and habitats that currently exist on the site. Numbers from the point counts can therefore be extrapolated to roughly estimate the number of breeding pairs present on the entire site for each species. Using an estimate of 6,000 ha for the area of the complex yields the following estimates

for the number of breeding pairs present: Eastern Meadowlark=2,800; Dickcissel=2,300; Grasshopper Sparrow=900, Henslow's Sparrow=500. These estimates represent substantial populations for these particular species with the potential to enhance the populations by enacting a management plan that reduces the woody encroachment of tree plantings and the invasive autumn olive and that also favors the restoration and maintenance of a variety of grassland habitats.

Successional Scrub Birds. Nineteen species of bird that are associated with successional scrub habitat (listed as "SS" in Table 2) were detected by the point counts. Several of these species were quite common (e.g., Northern Bobwhite, Common Yellowthroat, Brown Thrasher, Bell's Vireo, Willow Flycatcher, Gray Catbird, Yellow-breasted Chat) owing to the vast amounts of woody vegetation present on the site in the form of tree plantings and shrubby growth (much of which is the invasive autumn olive). The Loggerhead Shrike was the only state-listed threatened species present at low densities in open (grassland) areas that had a small component of shrubs. The Bell's Vireo, a Watch List species, was abundant in the many shrubby thickets scattered throughout the complex.

Winter. The site provides over-wintering habitat for a variety of species. Sixty-three species of bird were found on the site during the winter (Table 4). Large numbers of Northern Harriers and Short-eared Owls were found throughout the site for the duration of the winter. These individuals likely are migrants that pack into the site and utilize the grassland habitat as an over-winter site. Other species that were fairly common in the grassland habitat during the winter include the Red-winged Blackbird; Eastern Meadowlark; Horned Lark; American Tree, Song, Swamp, and LeConte's Sparrows; Northern Bobwhite, Mourning Dove, and Killdeer. The

wetlands and lakes on the site provided habitat for a variety of waterfowl (16 species of goose and duck) and waterbirds (Great Blue Heron and Pied-billed Grebe).

State of Illinois' Endangered and Threatened Birds. The dates and locations for observations of Illinois' Endangered and Threatened birds are given in Table 5. Twelve species were documented on the site during the year (winter, spring, and summer). Pied-billed Grebes were especially common during the winter with a few sightings in the early part of their breeding season. American Bitterns were seen in April and July in two different sections of the site. Northern Harriers were incredibly abundant during the winter with one or two pairs present during the breeding season. Short-eared Owls were also abundant during the winter, but none were seen after March. Upland Sandpipers were seen in two different sections during the early part of the breeding season. Loggerhead Shrikes were present during the winter and breeding season with individuals or pairs being seen in eight different sections during the breeding season. The shrikes were typically seen perched on old power lines or on shrubs in grassland habitat that included a small component of shrubs. Henslow's Sparrows had the largest breeding population of all of the Illinois' E&T species present on the site with at least 81 individuals observed during the breeding season. The Henslow's Sparrows were associated with undisturbed grassland that usually contained a mixture of brome, fescue, switch grass, broom sedge, red top, and other prairie plants.

DISCUSSION AND MANAGEMENT CONSIDERATIONS

The Pyramid State Park grassland complex currently supports large populations of several breeding bird species typical of the grassland, successional scrub, and wetland habitat

present on the site. The birds present on the site during the breeding season include game and nongame species, as well as species of special concern. A survey of grasslands in 19 reclaimed coal mines in Indiana yielded results similar to the survey at the PSP grassland complex (DeVault et al. 2002). They also found large populations of four grassland specialists including Eastern Meadowlarks, Dickcissels, Grasshopper Sparrows, and Henslow's Sparrows. These four species are among the top priority migratory grassland species of conservation concern in the Midwest, with Henslow' Sparrows at the top of the list (Herkert et al. 1996). All four of these species have shown significant declines since 1966 based on Breeding Bird Survey data (Sauer et al. 2001). The abundance of grassland birds at PSP and other reclaimed mines in the region, along with the large size of these grasslands (thousands of hectares), suggest that these reclaimed coal mines provide important habitat for grassland birds (Bajema et al. 2001, DeVault et al.2002).

Some of the advantages of managing grasslands on midwestern reclaimed mine sites listed by Devault et al. (2002) include: the large size and minimal development of these sites, the ease of managing for grassland habitat once it is established, the relative resistance to woody plant succession, ownership by single entities, and the relative scarcity of Brown-headed Cowbirds. Similar to what was found on reclaimed mine grasslands in Indiana (DeVault et al.2002), cowbirds were uncommon at the PSP grassland complex and we would predict that brood parasitism by cowbirds would be rare on a site as large as PSP (Johnson and Temple 1990). Studies of the nesting success of grassland birds at PSP would be necessary to determine that this is the case.

The grassland bird community on the site would benefit from management practices that promote a variety of grassland structure so that species such as Horned Larks and Upland

Sandpipers, which prefer short grass and bare areas, would become more abundant on the site. It is possible that haying leases and light grazing by cattle could be effective components of a management plan promoting grassland birds on the site (Herkert et al. 1993, Walk and Warner 2000). The timing of haying operations and the amount of grazing should follow the recommendations given in Herkert et al. (1993). The encroachment of woody vegetation (in the form of tree plantations and the invasive autumn olive) is the most substantial threat to the grassland habitat at PSP. Autumn olive is encroaching into grassland areas and is the dominant shrub in much of the site. Tree plantings also threaten the grassland habitat, and much of the site will revert to forest habitat is left unchecked. The longer the woody encroachment is allowed to proceed the more difficult it will be to remove it and to promote grassland habitat. There are several management options that may be necessary to remove the woody vegetation from areas where grasslands will be favored including mechanical removal, prescribed burning, and herbicide treatments. For grassland habitat that is already established or that will be restored, prescribed burning, light grazing, and haying are all useful tools for maintaining grassland habitat and for preventing succession of grassland areas to scrub-shrub or forest habitat (Herkert et al. 1993).

Nongame grassland birds are benefited from management strategies centered on protecting or establishing large contiguous grassland blocks, providing structurally diverse habitat, eliminating catastrophic mid-season grassland mowing, reducing edge, and eliminating and controlling woody encroachment (Herkert et al. 1993). Several management guidelines for grassland areas are presented in Herkert et al. (1993), and below I briefly highlight some of the most pertinent (i.e., important) for managing grasslands at PSP. Some important management guidelines for grassland habitat include:

1) Avoid fragmentation of existing grassland areas and manage in large blocks to maximize the likelihood of providing adequate habitat for area-sensitive species.
2) Grassland restorations should be large (thousands of acres are better than hundreds of acres) to benefit grassland bird species with high sensitivity to habitat fragmentation, to promote higher rates of nesting success (reduced brood parasitism by cowbirds and nest predation), and to allow for a more diverse management scheme.
3) Minimize the amount of linear edge, make the grassland as blocky as possible (circular or square plots are preferable).
4) Use mixtures of tall and short grasses for plantings to accommodate preferences of different grassland bird species. Native warm season grasses are preferred. Recommended tall grasses include big bluestem, Indian grass and switch grass. Recommended short grasses include little bluestem, side oats grama and prairie dropseed.
5) Conduct prescribed burns in a rotation of 20-30% of the area annually.
6) Remove and control woody vegetation that exceeds the normal grass height.
7) Light grazing that is properly controlled can be a valuable technique for managing grassland areas for breeding birds. Keep grazing light and use a rotation system to leave some areas idle while others are grazed.
8) If areas are to be hayed or mowed to control woody vegetation, avoid mowing prior to late July or early August to avoid destroying bird nests. In addition, it is recommended to mow on a rotational system as with grazing.

With much less of than 1% of the state's original 21 million acres of prairie/grassland habitat remaining, it is not surprising that populations of grassland wildlife (especially our

grassland birds) have also suffered substantial decreases in abundance. The acquisition and subsequent management of the PSP 6,000 ha reclaimed mine site is a tremendous opportunity to provide important grassland habitat for grassland-dependent birds. The PSP grassland complex is large enough that it would be possible to manage a substantial acreage (preferably >2000 acres) for nongame grassland birds, to provide habitat (e.g., shrub-scrub and wetland) for other wildlife resources elsewhere on the site, and to simultaneously provide the necessary recreational opportunities for the many different user groups associated with state park lands.

As a management plan for the PSP grassland complex is developed and evolves, and as different management practices are utilized, we now have the necessary baseline data for the bird community on the site to allow us to document changes in the bird community in relation to changes in land use and habitat management on the site. During 2003, the birds on the site will again be surveyed with special emphases on replicating the censuses of 2002, surveying areas of the site slated for specific management practices, conducting a thorough search for rare and uncommon species, and establishing permanent census points away from roads within each section of the site. These data will prove invaluable for documenting changes in the bird community as management on the site proceeds.

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FIGURE LEGENDS

Figure 1. Locations of roadside census points that were surveyed during 2002 on the Captain Unit of the Pyramid State Park grassland complex. Numbers for census points correspond with habitat descriptions given in Table 1.

Figure 2. Locations of roadside census points that were surveyed during 2002 on the Denmark Unit of the Pyramid State Park grassland complex. Numbers for census points correspond with habitat descriptions given in Table 1.

Figure 3. Locations of roadside census points that were surveyed during 2002 on the Galum Unit of the Pyramid State Park grassland complex. Numbers for census points correspond with habitat descriptions given in Table 1.

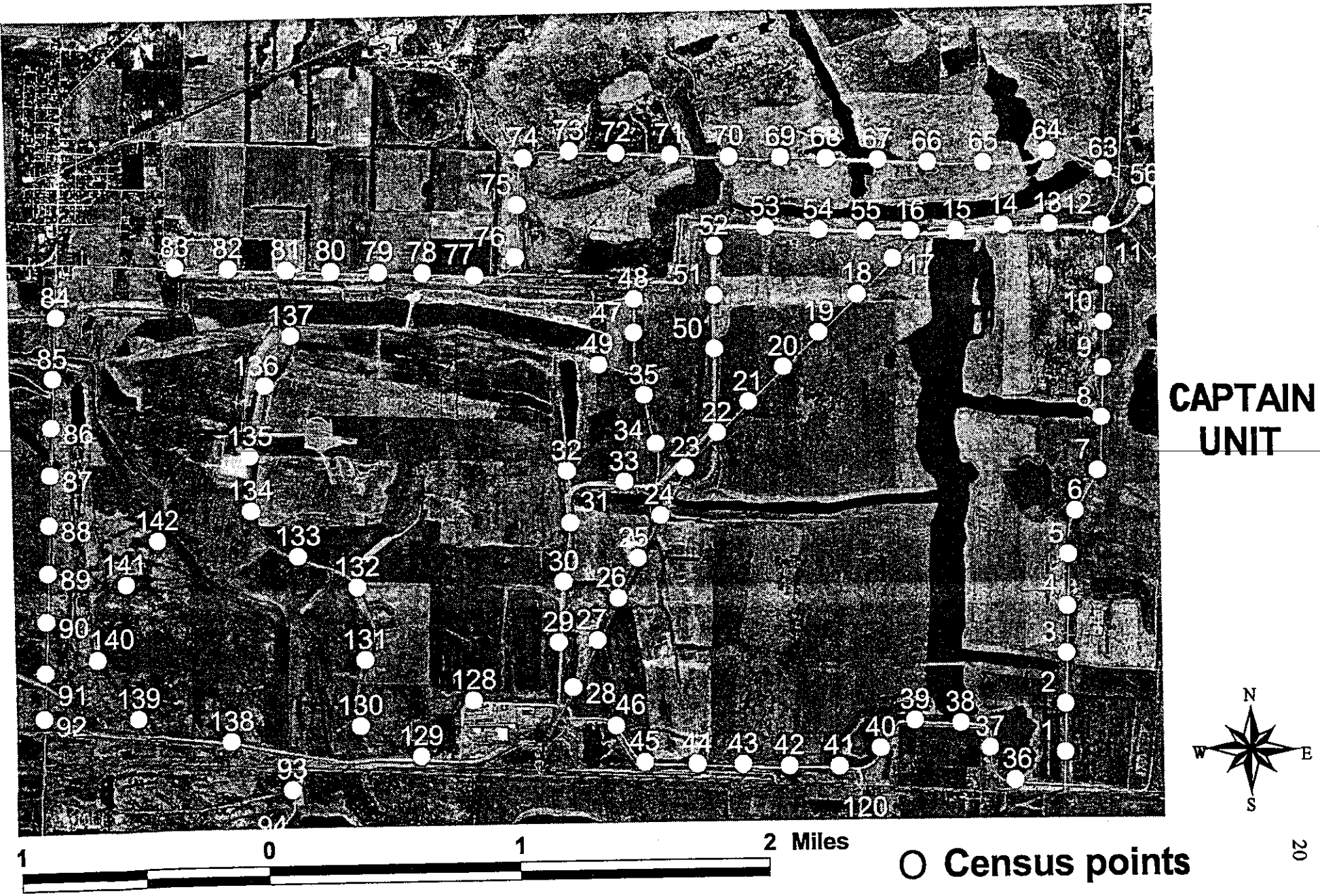
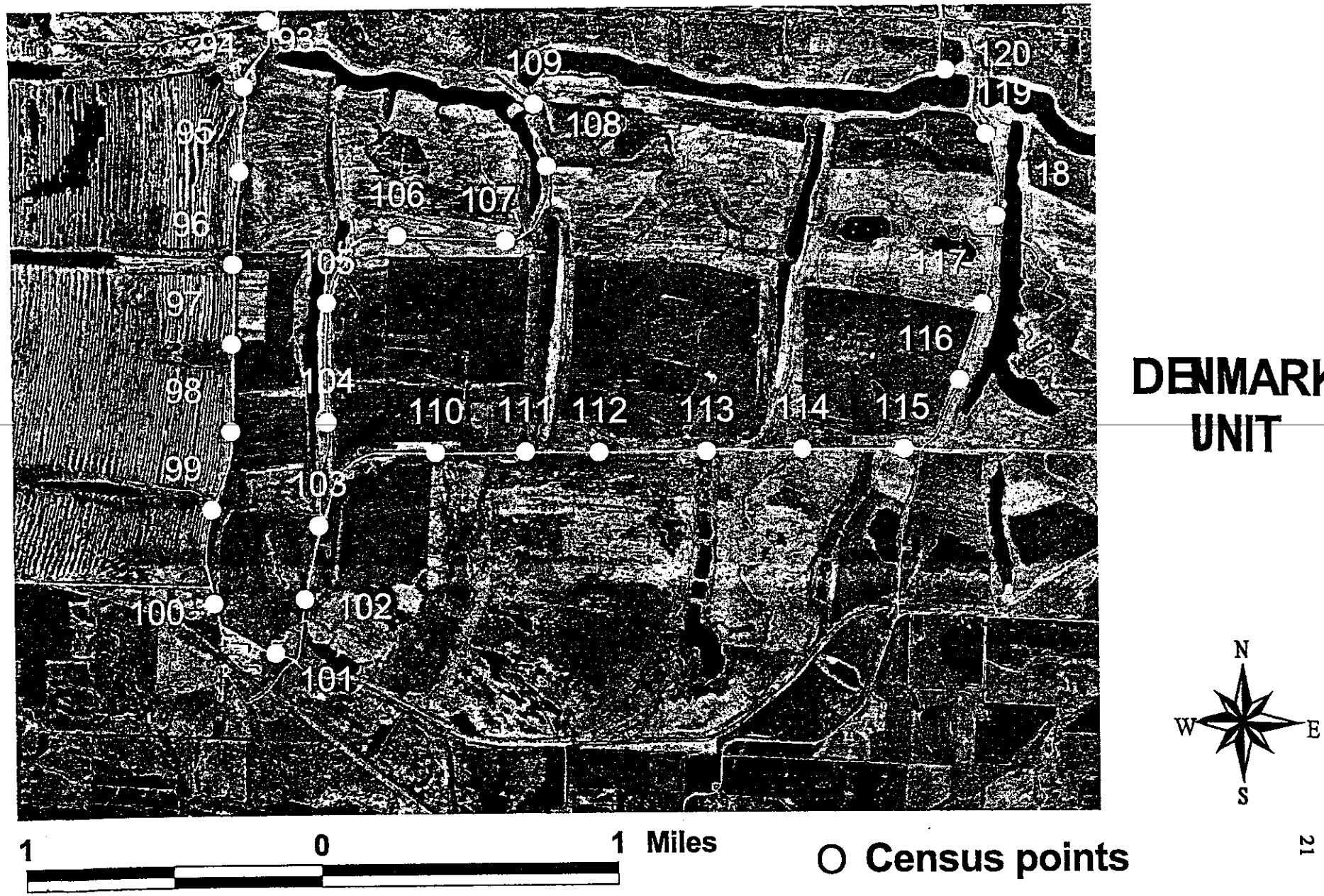


Figure 1.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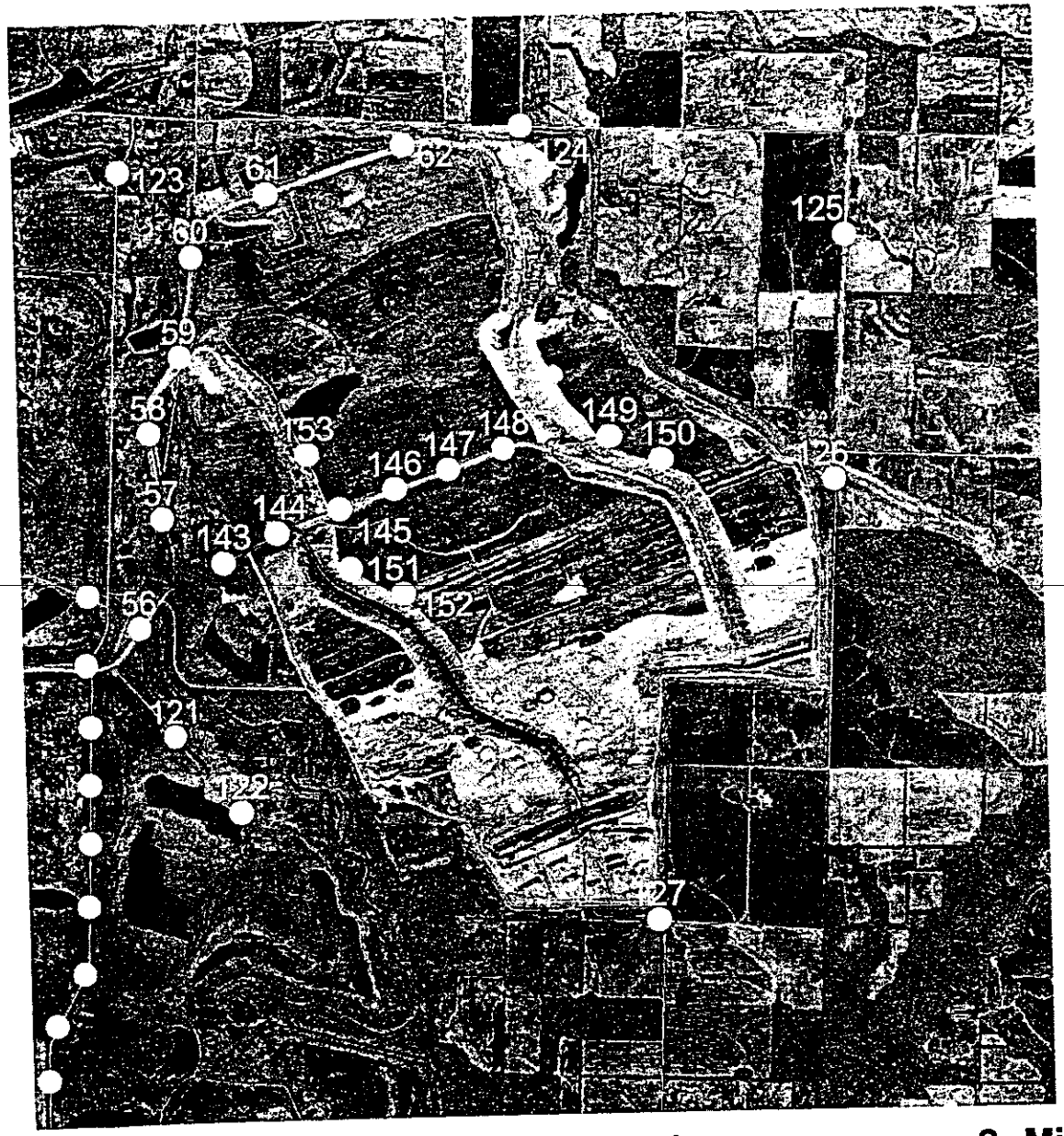

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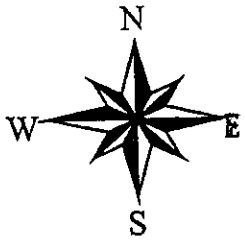

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○ Census points

Figure 3.

Table 1. Qualitative description of habitat for each census point at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Each column of habitat description represents the habitat present within one half of a 100m-radius circle centered on the census point.

Point	Qualitative Habitat Description[1]	Qualitative Habitat Description[1]
001	E:soybeans, 20m-wide ditch (F,B)	W:soybeans, 20m-wide ditch (F,B)
002	E:soybeans, 20m-wide ditch (SL)	W:soybeans, 20m-wide ditch (SL)
003	E:corn, 20m-wide ditch (F w/shrub mix)	W:corn, 20m-wide ditch (B,F)
004	E:corn, 10m-wide ditch (F w/shrub mix)	W:corn, 10m-wide ditch (B,AO)
005	E:corn, 15m-wide ditch (B w/shrub mix)	W:corn, 10m-wide ditch (B,F)
006	E:F w/shrub mix	W:TP w/ES,B,MG, other perrenial forbes
007	E:warm season pasture, F	W:TP w/B and F
008	E:SG,F	W:F dominant w/B,SC
009	E:TGP w/IG,BBS/ and BS,B, few AO	W:EGG hayed
010	E:TGP w/IG,BBS+10m ditch	W:EGG hayed
011	E:TGP w/IG,BBS+10m ditch	W:EGG hayed
012	N:AW, disturbed area, AO/gravel road	S:EGG,B,RT, few AO/gravel road
013	N:AW, dense AO, PH	S:Br, Rt, AO, EGG hay
014	N:PH, AO, AW, water	S:RT, PH, AW, corn
015	N:AW, PH, AO, water	S:water, RT, PH
016	N:RT, AW, PH, water with vetch slope	S:RT, SG, BS, AO and mixed shrubs
017	E:B, PH, tree plantings, AO scattered	W:AW, F, AO, tree plantings, PH
018	E:AW, SG, middle:aged tree plantings	W:AW, SG
019	E:AW, B, BS, trees	W:AW, B, BS, trees
020	E:AW, B, BS, trees	W:AW, B, BS, trees
021	E:AW, B, BS, trees	W:AW, OF w/goldenrod, cattail, BS, B, trees
022	E:AW, PH, B, trees, BS	W:AW, PH, RT
023	E:AW, B, PH, scatered trees and AO	W:wheat, SL, AW
024	E:B, soybeans, PH	W:AW, B, PH, pond, corn
025	E:soybeans, B, RT	W:corn, B, BS, AW, PH
026	E:B, F, OF w/goldenrod	W:AW, B
027	E:wheat, AW	W:wheat, AW
029	E:PH, wheat, AW	W:PH, B
030	E:PH, B, IG, SG, wheat, AW, 6 AO	W:PH, SG, sunflowers, B
031	E:PH, corn	W:PH, few AO, AW, sunflowers
032	E:pond, PH, AW, prairie grass, wheat stubble	W:PH, AW, sunflower, F
033	N:PH, IG+BBS	S:wheat stubble, AW slope to water
034	E:AW, IG, few AO	W:AW, IG
035	E:AW, IG	W:PH, AW, IG

Table 1. Qualitative description of habitat for each census point at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Each column of habitat description represents the habitat present within one half of a 100m-radius circle centered on the census point.

Point	Qualitative Habitat Description*	Qualitative Habitat Description*
036	N:F, SG, pond w/treeline	S:F, AOT w/mixed woodies
037	N:F, pond w/treeline	S:F, AOT, OF, young trees
038	N:F, little TGP, PH, pond	S:F, PH, hayfield, few woodies along fence
039	N:F, PH, pond	S:F, hayfield, pasture, tree row
040	N:PH, SL, W rim around pond	S:F, W, GR, wooded ravine
041	N:F, BS, SL, GR, scattered W	S:F slope, PH, pond, young trees
042	N:F, PH, tree planting w/RT+BS+B	S:F, PH, young trees
043	N:F, PH, tree planting w/cool season grasses	S:F, PH, young trees, pond
044	N:soybeans, ditch w/B+F+SG	S:F, B, woodies, railroad
045	N:B, OF, PH, soybeans	S:mowed F, woodies, road, railroad
046	N:F, PH, OF w/B+F	S:PH, F, woodies, road, shallow water
047	E:PH, prairie grass	W:F, AW roadside
048	E:AW, RT, SG	W:RT, F, PH, AW
049	N:F, RT slope, water	S:F, TGP, AW
050	E:RT, B, tree planting	W:RT, BR, IG+few AO+few W
051	E:RT, SG, prairie	W:RT, PH, B
052	E:RT, PH, tree planting w/B	W:RT, PH, B, scattered woodies
053	N:RT, AW, PH, water with vetch slope	S:RT, SG, tree plantings w/OF
054	N:RT, AW, PH, water with vetch slope	S:RT, SG, PH, few AO
055	N:RT, AW, PH, water with vetch slope	S:RT, SG, BS, few AO and W
056	N:SG,PH,wheat	S:AO w/young mixed woodies, wheat
057	E:wheat, AOT	W:wheat stuble, B, small trees, few AO
058	E:wheat	W:15m of wheat, AOT w/F
059	E:wheat	W:15m of wheat w/AW, AOT w/B
060	E:wheat	W:15m of wheat, AOT, OF w/goldenrod, PH
061	N:OF w/ SL, F, PH, AO	S:slope of lakeside, annuals, disturbed
062	N:wheat w/AW	S:ditch with AW, wheat
063	N:AOT, F, young forest	S:SL, stream, pond
064	N:F, AO, PH, pond	S:F, PH, pond, SC, few AO
065	N:F, few AO sprayed	S:F, few AO
066	N:F, AOT, W	S:PH, F dominant, few mixed shrubs
067	N:PH, pond	S:F, PH, pond
068	N:PH, pond	S:F, PH, pond, AO in rows
069	N:F, BS, AO rows	S:F, BS, mullen, 3 AO

Table 1. Qualitative description of habitat for each census point at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Each column of habitat description represents the habitat present within one half of a 100m-radius circle centered on the census point.

Point	Qualitative Habitat Description*	Qualitative Habitat Description*
070	N:BS, F, PH, pond	S:F, BS, AO row
071	N:F roadside, corn	S:F, corn, OF w/goldenrod
072	N:F roadside, soybeans	S:OF w/goldenrod roadside, corn, AO fencerow
073	N:F, OF, AO scattered	S:B roadside, corn
074	N:F, few shrub, cattail	S:OF roadside, corn
075	N:F, AO scattered	S:AW, F, AO scattered, PH
076	N:BS, OF w/goldenrod, AO scattered	S:AW, BS, OF, ditch, few AO
077	N:woody fence row, corn	S:OF w/goldenrod, TGP (IG+BBS)
078	N:F pasture, soybeans	S:OF w/goldenrod, TGP (IG+BBS)
079	N:soybeans, woody fence row	S:RT, OF w/goldenrod, BBS, IG, AO bunch
080	N:woody fence row, soybeans	S:OF w/goldenrod, TGP (IG+BBS)
081	N:soybeans	S:OF w/goldenrod, TGP (IG+BBS), RT
082	N:soybeans, tree fence row	S:OF w/goldenrod, TGP (IG+BBS), F
083	N:soybeans, tree fence row	S:soybeans, OF w/goldenrod, IG, BBS, forest
084	E:F, AOT, W, OF	W:AO, mixed woodies, OF, F
085	E:AW	W:pond, F, SC, OF, 2 AO
086	E:AW, PH, few W	W:pond, AW pasture
087	E:AW	W:F pasture
088	E:AW	W:F pasture
089	E:AW	W:moist soil, F pasture, dropseed
090	E:B, PT, RT, AW	W:PT+SG+AW pasture
091	E:F, AW	W:F, SG, AW, cattail, few mixed shrubs
092	E:B, F, scattered mixed shrubs	W:B, F, black locust, AW
093	E:gravel, AW, woods	W:gravel, AW, woods
094	E:B, AW, gravel, AO clumps	W:AW, AO row, water
095	E:milo, B, F	W:F, AW+F pasture, few shrubs, powerline
096	E:corn, B, F	W:F, mixed grass pasture, powerline
097	E:corn, B, F	W:F, mixed grass pasture, powerline
098	E:B, F ditch, goldenrod	W:F, pasture, powerline
099	E:F, OF, shrubs/trees, TGP w/IG	W:F, pasture, AO along road, powerline
100	E:B, W, CV	W:forest, abandoned homestead
101	N:W, water, F, AO	S:F
102	E:F, F pasture, OF, woodies	W:B, OF, scattered woodies
103	E:F, pasture, AW	W:B, AW

Table 1. Qualitative description of habitat for each census point at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Each column of habitat description represents the habitat present within one half of a 100m-radius circle centered on the census point.

Point	Qualitative Habitat Description*	Qualitative Habitat Description*
104	E:F, EGG, few AO	W:RT, B, water, CV
105	E:corn, goldenrod, B, row of AO, EGG	W:B, PH, water
106	N:EGG, B, SL ditch, AO scattered	S:EGG, B, little pasture
107	N:EGG hayed, SC, PH, sunflower	S:EGG hayed, SC, B, PH, goldenrod
108	E:soybean, B, tree planing w/B	W:B, B slope, water, PH, few W
109	N:B, GR, water ditch, EGG hayed	S:water, PH, B
110	N:B, F, F pasture, AO patches	S:B, AO woody thicket, F pasture w/few AO
111	N:F, B, PH, scattered AO	S:B, woody savanna, AO, F pasture
112	N:F, B, PH, scattered AO	S:B, woody savanna, AO, F pasture
113	N:B, F pasture, OF, scattered AO	S:B, OF, scattered trees, AOT
114	N:F, RC, OF, W and AOT	S:F, PH, scattered AO
115	N:PH, OF, scattered trees and AO, notill soybeans	S:B, OF, scattered AO
116	E:F, CV, water, PH	W:B, wheat stubble now soybeans
117	E:B, RT, PH, water	W:corn, B edge
118	E:B, PH, water	W:tree planting w/B, OF
119	E:young tree planting in B+F	W:B ditch, prairie grass hayed
120	N:F	S:water, AW and W strip
121	E:F in ditch, AOT, W, pond	W:F, B, AO scattered
122	E:F, SW, AOT	W:F, AO, lake
123	E:OF, PH, W grove	W:AW, wheat stubble, OF, AO patch
124	N:notill soybeans	S:F, OF, scattered AO, willow ditch
125	E:corn, F, 2 big trees	W:soybeans, F ditch
126	E:prairie planting, F, soybeans	W:AW, RT, disturbed field, woodlot
127	N:soybeans, wheat, AW, 3 AO	S:soybeans, woodlot
128	N:PH, B, AO scattered, water	S:gravel
129	N:AW, PH, water, few trees and shrubs	S:gravel, PH, railroad
130	E:AW, PH, cattails, goldenrod, F	W:B, SG
131	E:soybeans, AW, B, SG	W:B, SG
132	E:soybeans, PH, foxtail, tree plantings	W:B, SG, F, AO scattered
133	E:RT, AW, B, tree plantings	W:B, F, PH
134	E:corn, AW, PH, treeline	W:SG, IG
135	E:corn, AW, PH	W:RT
136	E:soybeans, AW, foxtail	W:AW, F, sunflower, SG
137	E:soybeans, AW	W:AW, F

Table 1. Qualitative description of habitat for each census point at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Each column of habitat description represents the habitat present within one half of a 100m-radius circle centered on the census point.

Point	Qualitative Habitat Description*	Qualitative Habitat Description*
138	N:cattail, shallow pond w/willow and shrub	S:AW, F, AO scattered, rail with few trees
139	E:F, OF, scattered large trees	W:AW
140	E:F, CV, little goldenrod and pokeweed	W:AW, PH
141	N:AW, F, goldenrod	S:AW, B, CV, boneset, F
142	E:PT, AW, F, PH, partial tree planting w/B	W:AW, B on levee, F, goldenrod, tree planting
143	N:wheat in ditch, young forest	S:wheat in ditch, young forest, AOT
144	N:F, B, AW, gravel	S:F in ditch, OF w/goldenrod, W
145	N:F, AW, notill soybeans	S:F in ditch, RT, TGP (BBS+IG)
146	N:F in ditch, notill soybeans	S:F in ditch, RT, AW, TGP (IG+BBS)
147	N:F in ditch, notill soybeans	S:F in ditch, TGP (BBS+IG)
148	N:F w/SC, notill soybeans	S:F+AW in ditch, TGP
149	N:AW, B, soybeans	S:F, AW
150	E:AW, F, B	W:F on slope to lake
151	E:TGP (IG), AW roadside	W:AW, SG, bare ground, wheat on slope
152	E:TGP (IG), AW roadside	W:AW, IG, AW, wheat on slope
153	E:F, notill soybeans	W:B, F, SC

*The first letter in each description indicates Northern (N), Southern (S), Eastern (E), or Western (W) half of the circle.

*Key (in alphabetical order) for abbreviations in habitat descriptions.

AO=Autumn Olive
AOT=Autumn Olive Thicket
AW=Annual Weeds (Boneset, Goldenrod, Cheatgrass, Sunflower, Foxtail)
B=Brome
BBS=Big Blue Stem
BS=Broom Sedge
CV=Crown Vetch
EGG=Eastern Gamma Grass
ES=Early Successional
F=Fescue
GG=Grease Grass
IG=Indian Grass
MG=Mixed Grasses
OF=Old Field
PH=Phragmites
PT=Purple Top
RC=Reed Canary Grass
RT=Red Top
SC=Sweet Clover
SG=Switch Grass
SL=Serecia Lespediza
TGP=Tall Grass Prairie
TP=Tree Planting
W=Willow

Table 2. Summary of 153 breeding bird point counts (100m fixed-radius) at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Species listed from most to least abundant.

Species	Scientific Name	Number of Individuals	Number per Hectare	Percentage Occurrence	Special Status*	Habitat Association**
Red-winged Blackbird	*Agelaius phoeniceus*	1058	2.202	93.5		W, GA
American Goldfinch	*Carduelis tristis*	246	0.512	69.9		SS, GA
Eastern Meadowlark	*Sturnella magna*	227	0.473	65.4		GS
Common Grackle	*Quiscalus quiscula*	224	0.466	21.6		O
Indigo Bunting	*Passerina cyanea*	199	0.414	72.5		SS
Dickcissel	*Spiza americana*	185	0.385	53.6		GS
Northern Bobwhite	*Colinus virginianus*	151	0.314	59.5		SS,GA
Mourning Dove	*Zenaida macroura*	113	0.235	42.5		O, GA
Common Yellowthroat	*Geothlypis trichas*	92	0.191	47.7		SS, GA
Field Sparrow	*Spizella pusilla*	85	0.177	36.6		SS, GA
Canada Goose	*Branta canadensis*	78	0.162	3.3		W
American Robin	*Turdus migratorius*	74	0.154	28.8		O
Grasshopper Sparrow	*Ammodramus savannarum*	74	0.154	23.5		GS
Brown Thrasher	*Toxostoma rufum*	67	0.139	30.7		SS
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	62	0.129	19.0		O
Bell's Vireo	*Vireo bellii*	61	0.127	22.9		SS
Killdeer	*Charadrius vociferus*	55	0.114	26.8		O, GA
Willow Flycatcher	*Empidonax traillii*	55	0.114	28.1		SS
Northern Cardinal	*Cardinalis cardinalis*	51	0.106	27.5		SS
Eastern Kingbird	*Tyrannus tyrannus*	42	0.087	18.3		O
Henslow's Sparrow	*Ammodramus henslowii*	41	0.085	13.7	E	GS
European Starling	*Sturnus vulgaris*	39	0.081	2.6		O
Gray Catbird	*Dumetella carolinensis*	32	0.067	13.1		SS
Yellow-billed Cuckoo	*Coccyzus americanus*	31	0.065	19.0		O
Eastern Towhee	*Pipilo erythrophthalmus*	28	0.058	12.4		SS
Brown-headed Cowbird	*Molothrus ater*	27	0.056	9.8		O, GA
Song Sparrow	*Melospiza melodia*	23	0.048	11.8		SS, GA
Yellow-breasted Chat	*Icteria virens*	18	0.037	9.8		SS
Yellow Warbler	*Dendroica petechia*	17	0.035	8.5		SS
Common Nighthawk	*Chordeiles minor*	13	0.027	5.2		O
Eastern Bluebird	*Sialia sialis*	13	0.027	7.8		O
Great Blue Heron	*Ardea herodias*	13	0.027	7.2		W
Mallard	*Anas platyrhynchos*	13	0.027	5.2		W
Warbling Vireo	*Vireo gilvus*	13	0.027	7.2		O
Horned Lark	*Eremophila alpestris*	12	0.025	4.6		GS
Northern Mockingbird	*Mimus polyglottos*	12	0.025	5.2		SS
Barn Swallow	*Hirundo rustica*	10	0.021	2.6		O
House Sparrow	*Passer domesticus*	10	0.021	2.0		O

Table 2. Summary of 153 breeding bird point counts (100m fixed-radius) at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Species listed from most to least abundant.

Species	Scientific Name	Number of Individuals	Number per Hectare	Percentage Occurrence	Special Status*	Habitat Association**
Red-tailed Hawk	*Buteo jamiacensis*	9	0.019	5.9		O
Blue Grosbeak	*Guiraca caerulea*	8	0.017	5.2		SS
Blue Jay	*Cyanocitta cristata*	8	0.017	3.3		O
Green Heron	*Butorides virescens*	8	0.017	5.2		W
Tree Swallow	*Tachycineta bicolor*	8	0.017	2.6		O
Eastern Phoebe	*Sayornis phoebe*	6	0.012	3.3		O
Blue-winged Teal	*Anas discors*	5	0.010	0.7		W
Orchard Oriole	*Icterus spurius*	5	0.010	3.3		O
Chimney Swift	*Chaetura pelagica*	4	0.008	2.0		O
Northern Harrier	*Circus cyaneus*	4	0.008	2.0	E	GS
American Crow	*Corvus brachyrhynchos*	3	0.006	0.7		O
American Kestrel	*Falco sparverius*	3	0.006	2.0		O
Downy Woodpecker	*Picoides pubescens*	3	0.006	2.0		O
Turkey Vulture	*Cathartes aura*	3	0.006	1.3		O
White-eyed Vireo	*Vireo griseus*	3	0.006	2.0		SS
Carolina Wren	*Thryothorus ludovicianus*	2	0.004	1.3		SS
Eastern Wood-Pewee	*Contopus virens*	2	0.004	1.3		O
Great-horned Owl	*Bubo virginianus*	2	0.004	1.3		O
Loggerhead Shrike	*Lanius ludovicianus*	2	0.004	1.3	T	SS
Belted Kingfisher	*Ceryle alcyon*	1	0.002	0.7		W
Cooper's Hawk	*Accipiter cooperii*	1	0.002	0.7		O
Double-crested Cormorant	*Phalacrocorax auritus*	1	0.002	0.7	T	W
Hairy Woodpecker	*Picoides villosus*	1	0.002	0.7		O
House Wren	*Troglodytes aedon*	1	0.002	0.7		SS
Red-bellied Woodpecker	*Melanerpes carolinus*	1	0.002	0.7		O
Red-headed Woodpecker	*Melanerpes erythrocephalus*	1	0.002	0.7		O
Ruby-throated Hummingbird	*Archilochus colubris*	1	0.002	0.7		O

* Indicates those species on the Endangered (E) and Threatened (T) species list for Illinois.

**Characteristic breeding habitat. The first designation is from Sauer et al. (1999): GS=grassland specialist; SS=successional scrub; W=wetlands; O=other or not classified. GA ("grassland associated") designates facultative grassland users that regularly breed in Midwestern grasslands (Herkert 1994: Table 1), but are not grassland specialists.

Table 3. Summary of a survey (number of individuals seen per unit of observation time) of the birds present during the breeding season at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Species listed from most to least observed.

Species	Scientific Name	Number Observed	Number per Observer Hour	Special Status*
Red-winged Blackbird	*Agelaius phoeniceus*	1827	24.689	
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	601	8.122	
Eastern Meadowlark	*Sturnella magna*	413	5.581	
American Goldfinch	*Carduelis tristis*	189	2.554	
Indigo Bunting	*Passerina cyanea*	164	2.216	
Dickcissel	*Spiza americana*	153	2.068	
Tree Swallow	*Tachycineta bicolor*	153	2.068	
Field Sparrow	*Spizella pusilla*	139	1.878	
Mallard	*Anas platyrhynchos*	129	1.743	
Mourning Dove	*Zenaida macroura*	123	1.662	
Canada Goose	*Branta canadensis*	114	1.541	
Common Grackle	*Quiscalus quiscula*	106	1.432	
Killdeer	*Charadrius vociferus*	95	1.284	
Bell's Vireo	*Vireo bellii*	69	0.932	
Great Blue Heron	*Ardea herodias*	64	0.865	
Northern Bobwhite	*Colinus virginianus*	63	0.851	
American Robin	*Turdus migratorius*	61	0.824	
Brown Thrasher	*Toxostoma rufum*	61	0.824	
Eastern Kingbird	*Tyrannus tyrannus*	52	0.703	
Barn Swallow	*Hirundo rustica*	46	0.622	
Grasshopper Sparrow	*Ammodramus savannarum*	45	0.608	
Henslow's Sparrow	*Ammodramus henslowii*	42	0.568	E
Blue-winged Teal	*Anas discors*	35	0.473	
Gray Catbird	*Dumetella carolinensis*	29	0.392	
Willow Flycatcher	*Empidonax traillii*	26	0.351	
Northern Cardinal	*Cardinalis cardinalis*	25	0.338	
Common Snipe	*Gallinago gallinago*	20	0.270	
American Crow	*Corvus brachyrhynchos*	18	0.243	
Turkey Vulture	*Cathartes aura*	18	0.243	

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Species	Scientific Name	Number Observed	Number per Observer Hour	Special Status*
Red-tailed Hawk	*Buteo jamiacensis*	17	0.230	
Eastern Towhee	*Pipilo erythrophthalmus*	16	0.216	
Horned Lark	*Eremophila alpestris*	14	0.189	
Song Sparrow	*Melospiza melodia*	13	0.176	
Carolina Chickadee	*Poecile carolinensis*	12	0.162	
Blue Jay	*Cyanocitta cristata*	11	0.149	
Yellow-billed Cuckoo	*Coccyzus americanus*	11	0.149	
Brown-headed Cowbird	*Molothrus ater*	10	0.135	
Eastern Phoebe	*Sayornis phoebe*	9	0.122	
Loggerhead Shrike	*Lanius ludovicianus*	9	0.122	T
Northern Harrier	*Circus cyaneus*	9	0.122	E
Swamp Sparrow	*Melospiza georgiana*	9	0.122	
Yellow Warbler	*Dendroica petechia*	9	0.122	
American Coot	*Fulica americana*	8	0.108	
Yellow-breasted Chat	*Icteria virens*	8	0.108	
American Kestrel	*Falco sparverius*	7	0.095	
Blue Grosbeak	*Guiraca caerulea*	7	0.095	
Common Yellowthroat	*Geothlypis trichas*	7	0.095	
Green Heron	*Butorides virescens*	7	0.095	
Savannah Sparrow	*Passerculus sandwichensis*	6	0.081	
Red-bellied Woodpecker	*Melanerpes carolinus*	5	0.068	
European Starling	*Sturnus vulgaris*	4	0.054	
Rough-legged Hawk	*Buteo lagopus*	4	0.054	
Barred Owl	*Strix varia*	3	0.041	
Blue-gray Gnatcatcher	*Polioptila caerulea*	3	0.041	
Carolina Wren	*Thryothorus ludovicianus*	3	0.041	
Cedar Waxwing	*Bombycilla cedrorum*	3	0.041	
House Sparrow	*Passer domesticus*	3	0.041	
Northern Flicker	*Colaptes auratus*	3	0.041	

Table 3. Summary of a survey (number of individuals seen per unit of observation time) of the birds present during the breeding season at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Species listed from most to least observed.

Species	Scientific Name	Number Observed	Number per Observer Hour	Special Status*
Solitary Sandpiper	*Tringa solitaria*	3	0.041	
Chimney Swift	*Chaetura pelagica*	2	0.027	
Common Nighthawk	*Chordeiles minor*	2	0.027	
Marsh Wren	*Cistothorus palustris*	2	0.027	
Northern Mockingbird	*Mimus polyglottos*	2	0.027	
Orchard Oriole	*Icterus spurius*	2	0.027	
Pied-billed Grebe	*Podilymbus podiceps*	2	0.027	T
Sharp-shinned Hawk	*Accipiter striatus*	2	0.027	E
Upland Sandpiper	*Bartramia longicauda*	2	0.027	E
American Bittern	*Botaurus lentiginosus*	1	0.014	E
Baltimore Oriole	*Icterus galbula*	1	0.014	
Chipping Sparrow	*Spizella passerina*	1	0.014	
Eastern Bluebird	*Sialia sialis*	1	0.014	
Great-crested Flycatcher	*Muiarchus crinitus*	1	0.014	
Great-horned Owl	*Bubo virginianus*	1	0.014	
King Rail	*Rallus elegans*	1	0.014	T
Le Conte's Sparrow	*Ammodramus leconteii*	1	0.014	
Palm Warbler	*Dendroica palmarum*	1	0.014	
Ruby-throated Hummingbird	*Archilochus colubris*	1	0.014	
Sandhill Crane	*Grus canadensis*	1	0.014	E
Semipalmated Plover	*Charadrius simipalmatus*	1	0.014	
White-breasted Nuthatch	*Sitta carolinensis*	1	0.014	
White-eyed Vireo	*Vireo griseus*	1	0.014	

* Indicates those species on the Endangered (E) and Threatened (T) species list for Illinois.

Table 4. Summary of a survey (number of individuals seen per unit of observation time) of the birds present during the winter at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Species listed from most to least observed.

Species	Scientific Name	Number Observed	Number per Observer Hour	Special Status*
Snow Goose	*Chen caerulescens*	11060	283.590	
Red-winged Blackbird	*Agelaius phoeniceus*	2871	73.615	
Canada Goose	*Branta canadensis*	1767	45.308	
American Coot	*Fulica americana*	649	16.641	
Mallard	*Anas platyrhynchos*	622	15.949	
Common Grackle	*Quiscalus quiscula*	549	14.077	
Blackbird spp.		500	12.821	
American Tree Sparrow	*Spizella arborea*	457	11.718	
Eastern Meadowlark	*Sturnella magna*	347	8.897	
Horned Lark	*Eremophila alpestris*	242	6.205	
Ring-necked Duck	*Aythya collaris*	192	4.923	
Gadwall	*Anas strepera*	169	4.333	
Greater White-fronted Goose	*Anser albifrons*	157	4.026	
American Robin	*Turdus migratorius*	145	3.718	
Northern Harrier	*Circus cyaneus*	104	2.667	E
Killdeer	*Charadrius vociferus*	103	2.641	
Song Sparrow	*Melospiza melodia*	89	2.282	
Swamp Sparrow	*Melospiza georgiana*	84	2.154	
European Starling	*Sturnus vulgaris*	68	1.744	
Mourning Dove	*Zenaida macroura*	63	1.615	
Lesser Scaup	*Aythya affinis*	56	1.436	
Red-tailed Hawk	*Buteo jamiacensis*	44	1.128	
Dark-eyed Junco	*Junco hyemalis*	40	1.026	
Northern Bobwhite	*Colinus virginianus*	38	0.974	
Green-winged Teal	*Anas crecca*	35	0.897	
American Widgeon	*Anas americana*	34	0.872	
Leconte's Sparrow	*Ammodramus lecontell*	34	0.872	
Bufflehead	*Bucephala albeola*	32	0.821	
Northern Shoveler	*Anas clypeata*	32	0.821	

Table 4. Summary of a survey (number of individuals seen per unit of observation time) of the birds present during the winter at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Species listed from most to least observed.

Species	Scientific Name	Number Observed	Number per Observer Hour	Special Status*
Short-eared Owl	*Asio flammeus*	32	0.821	E
Northern Cardinal	*Cardinalis cardinalis*	31	0.795	
Ring-billed Gull	*Larus delawarensis*	30	0.769	
Northern Flicker	*Colaptes auratus*	20	0.513	
Carolina Chickadee	*Poecile carolinensis*	18	0.462	
Lapland Longspur	*Calcarius lapponicus*	15	0.385	
White-throated Sparrow	*Zonotrichia albicollis*	15	0.385	
American Kestrel	*Falco sparverius*	14	0.359	
Great Blue Heron	*Ardea herodias*	13	0.333	
Downy Woodpecker	*Picoides pubescens*	12	0.308	
Brown-headed Cowbird	*Molothrus ater*	10	0.256	
Blue Jay	*Cyanocitta cristata*	9	0.231	
Pied-billed Grebe	*Podilymbus podiceps*	9	0.231	T
Canvasback	*Aythya valisineria*	7	0.179	
American Goldfinch	*Carduelis tristis*	6	0.154	
Greater Scaup	*Aythya marila*	6	0.154	
Loggerhead Shrike	*Lanius ludovicianus*	6	0.154	T
Eastern Bluebird	*Sialia sialis*	5	0.128	
American Crow	*Corvus brachyrhynchos*	4	0.103	
Blue-winged Teal	*Anas discors*	4	0.103	
Eastern Towhee	*Pipilo erythrophthalmus*	4	0.103	
Common Snipe	*Gallinago gallinago*	3	0.077	
Hooded Merganser	*Lophodytes cucullatus*	3	0.077	
Rough-legged Hawk	*Buteo lagopus*	3	0.077	
Bald Eagle	*Haliaeetus leucocephalus*	2	0.051	E
American Black Duck	*Anas rubripes*	2	0.051	
Tufted Titmouse	*Baeolophus bicolor*	2	0.051	
Rock Dove	*Columba livia*	2	0.051	
Barred Owl	*Strix varia*	1	0.026	

Table 4. Summary of a survey (number of individuals seen per unit of observation time) of the birds present during the winter at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002. Species listed from most to least observed.

Species	Scientific Name	Number Observed	Number per Observer Hour	Special Status*
Lark Sparrow	*Chondestes grammacus*	1	0.026	
Northern Mockingbird	*Mimus polyglottos*	1	0.026	
Pileated Woodpecker	*Dryocopus pileatus*	1	0.026	
Red-bellied Woodpecker	*Melanerpes carolinus*	1	0.026	
Sharp-shinned Hawk	*Accipiter striatus*	1	0.026	E

* Indicates those species on the Endangered (E) and Threatened (T) species list for Illinois.

Table 5. Dates and Locations for Illinois' Endangered and Threatened birds observed at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002.

Species (status*)	Date	Number of Individuals	Location		
			Township	Range	Section
Pied-billed Grebe (T)	02/22/02	2	6S	4W	12
(Podilymbus podiceps)	02/22/02	1	6S	4W	13
	02/22/02	2	6S	4W	12
	02/22/02	1	6S	4W	13
	03/01/02	1	6S	4W	1
	03/01/02	1	6S	4W	1
	03/01/02	1	6S	4W	11
	03/01/02	1	6S	4W	27
	03/18/02	1	6S	4W	1
	03/18/02	1	6S	4W	2
	03/18/02	1	6S	4W	35
	04/19/02	1	6S	4W	11
	04/26/02	1	6S	4W	1
American Bittern (E)	04/19/02	1	6S	4W	11
(Botaurus lentiginosus)	07/22/02	1	6S	3W	6
Northern Harrier (E)	Jan-March	104	6S	3W,4W	ALL
(Circus cyaneus)	05/22/02	1	6S	4W	11
	06/08/02	1	6S	4W	10
	06/29/02	1	6S	3W	5
	06/29/02	1	6S	4W	15
	07/22/02	2	5S	3W	31
	07/22/02	2	6S	3W	6
	07/22/02	1	6S	3W	6
Sharp-shinned Hawk (E)	03/07/02	1	6S	4W	15
(Accipiter striatus)	05/30/02	1	6S	4W	16
	07/22/02	1	6S	4W	6

Table 5. Dates and Locations for Illinois' Endangered and Threatened birds observed at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002.

Species (status*)	Date	Number of Individuals	Location		
			Township	Range	Section
Osprey (E)	04/19/02	1	6S	4W	1
(Pandion haliaetus)					
Bald Eagle (E)	03/01/02	1	6S	4W	3
(Haliaeetus leucocephalus)	03/01/02	1	6S	4W	13
King Rail (T)	05/22/02	1	6S	4W	14
(Rallus elegans)					
Sandhill Crane (E)	04/19/02	1	6S	4W	11
(Grus canadensis)					
Upland Sandpiper (E)	04/26/02	1	6S	4W	8
(Bartramia longicauda)	05/14/02	1	6S	4W	31
Short-eared Owl (E)	03/01/02	22	6S	4W	11
(Asio flammeus)	03/01/02	6	6S	4W	22
	03/07/02	1	6S	4W	15
	03/07/02	1	6S	4W	28
	03/11/02	1	6S	4W	24
	03/18/02	1	6S	4W	26
Loggerhead Shrike (T)	02/14/02	1	6S	4W	1
(Lanius ludovicianus)	02/14/02	1	6S	4W	12
	03/01/02	2	6S	4W	11
	03/01/02	1	6S	4W	14
	03/18/02	1	6S	4W	27
	04/19/02	1	6S	4W	9
	05/05/02	4	6S	4W	28

Table 5. Dates and Locations for Illinois' Endangered and Threatened birds observed at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002.

Species (status*)	Date	Number of Individuals	Location		
			Township	Range	Section
Loggerhead Shrike (T)	05/05/02	1	6S	4W	8
(Lanius ludovicianus)	05/14/02	2	6S	4W	26
	06/07/02	1	6S	4W	21
	06/07/02	1	6S	4W	28
	06/08/02	1	6S	4W	10
	06/22/02	1	6S	4W	21
	06/29/02	2	6S	4W	28
	07/19/02	1	6S	4W	16
	07/22/02	1	6S	4W	16
	07/31/02	1	6S	4W	1
Henslow's Sparrow (E)	04/19/02	3	6S	4W	16
(Ammodramus henslowii)	04/26/02	1	6S	4W	28
	05/05/02	7	6S	4W	24
	05/30/02	3	6S	4W	16
	05/30/02	3	6S	4W	17
	05/30/02	1	6S	4W	27
	05/30/02	2	6S	4W	28
	06/07/02	3	6S	4W	9
	06/08/02	3	6S	4W	12
	06/08/02	2	6S	4W	12
	06/12/02	1	6S	4W	14
	06/12/02	3	6S	4W	10
	06/12/02	5	6S	4W	11
	06/12/02	2	6S	4W	10
	06/12/02	2	6S	4W	2
	06/22/02	1	6S	4W	3
	06/22/02	1	6S	4W	21
	06/22/02	2	6S	4W	28
	06/22/02	3	6S	4W	28

Table 5. Dates and Locations for Illinois' Endangered and Threatened birds observed at the Arkland reclaimed mine site (now Pyramid State Park) in Perry County, Illinois, 2002.

Species (status*)	Date	Number of Individuals	Location		
			Township	Range	Section
Henslow's Sparrow (E)	06/22/02	1	6S	4W	33
(Ammodramus henslowii)	06/22/02	1	6S	4W	33
	06/22/02	2	6S	4W	12
	06/29/02	1	6S	3W	5
	07/09/02	3	6S	3W	8
	07/14/02	6	5S	3W	32
	07/14/02	4	6S	4W	9
	07/19/02	3	6S	4W	27
	07/19/02	1	6S	4W	27
	07/19/02	1	6S	4W	23
	07/19/02	1	6S	4W	16
	07/19/02	2	6S	4W	9
	07/22/02	4	6S	3W	6
	07/22/02	1	6S	3W	5
	07/22/02	1	6S	3W	5
	07/22/02	1	6S	4W	10

* E indicates endangered and T indicates threatened species in Illinois.