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Studies on the Avifauna of Burgner Acres, an Upland Stream-Side, Ash-Elm Forest and Its Edge

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STUDIES ON THE AVIFAUNA OF BURGNER ACRES, AN UPLAND

STREAM-SIDE, ASH-ELM FOREST AND ITS EDGE

(TITLE)

BY

KERRY LEE BRYAN

B. S. in Ed., Eastern Illinois University, 1967

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

Master of Science in Zoology

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

1968

YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING
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INTRODUCTION

Burgner Acres, an upland stream-side, ash-elm forest and edge, was donated to Eastern Illinois University, Charleston, January 29, 1955, by Mrs. Helen Burgner Douglas, Mattoon, Illinois, in memory of her father and grandparents, pioneer settlers in Coles County.

It is now used by the Division of Life Sciences at Eastern as an outdoor laboratory and study area. Various types of field work and class studies have been carried on at Burgner Acres by faculty and students since its acquisition.

The study of bird populations at Burgner Acres was begun in September, 1964, by Dr. Harry Peterka, Eastern Illinois University, Charleston, concluded in August, 1966, and mimeographed in 1967. His study, as did similar studies of other areas, gave evidence that bird populations fluctuate with a change in environment. The abundance of a species or a number of species could change due to factors such as temperature, photoperiod, nesting sites and materials, pesticides, predators, disease, parasites, and man as well as food and water.

In anticipation that this study will be one of a long series to measure the avifaunal succession of Burgner Acres as well as other fauna and flora, the following course of investigation was taken:

1. To find the bird populations associated with an ash-elm forest and its edge (Burgner Acres).

2. To find the density per one hundred acres for each species of bird observed.
3. To find the relative bird abundance based on the frequency of occurrence per total number of trips for each species.
4. To compare data collected at Burgner Acres with previous studies of the area (Peterka, 1967) and with another wood-lot, Trelease Woods, Champaign County, Illinois (Kendeigh and Barnett, 1966, 1967).

Burgner Acres provides ^s anctuary for wildlife and is maintained undisturbed except for a footpath, occasional mowing around the gate, labeling of a few trees, the marking of quadrates, and the building of two bridges across Sycamore Creek.

LITERATURE REVIEW

Observations on birds began in very early times as noted by the crude drawings of Neolithic man in Spain six to eight thousand years ago (Wallace 1959).

Watching birds has always been a popular pursuit of man. It has increased in momentum as a scientific or popular pastime through the centuries and attained a magnitude of popularity through new aids and conveniences for field studies.

HABITAT ASSOCIATION: A major factor determining the species of bird in a given area and the abundance of that species is the type and quality of habitat. Normally the succession of a habitat is relatively slow; thus, the succession of the avifauna will also be gradual.

An illustration of a gradual succession of avifauna was seen by Kendeigh and Brooks (1964) when they found the Downy Woodpecker had declined progressively from nineteen birds in 1956-57 to two during their study. Errington (1934) suggested a bird population will suffer light losses from predation if it fits well into the environment and heavy losses if the environment is weak; therefore, the stability of the avifauna will be in direct relation to the stability of the environment. To illustrate the close avifaunal-habitat relationship Graber and Graber (1963) declared that some summer habitats tended to have

certain avifaunal associations which were quite distinctive. They further contended each habitat could be defined to a certain extent in terms of the qualitative and quantitative characteristics of its avifauna. The stability of the avifauna-habitat complex was recognized by Peterka (1967) when he examined the bird populations of Burgner Acres, an ash-elm forest and its edge, and found temperature did not affect the populations during the winter season. His study also found the departure and arrival dates for migrant birds were constant for the two years of study.

Wallace (1959) found that the heaviest bird populations were in built-up areas such as sanctuaries; thus, restricting size of population in both species and individuals to the habitat which is the most stable.

Hand (1962) studied the bird populations in a deciduous wooded ravine, stream and edge in Pennsylvania, during the months of May and June, and stated that the only bird which preferred the sides of the ravine to the brushy bottomland was the Red-eyed Vireo, indicating a restriction to a particular type of habitat.

Borst (1967) reviewed the similarities of forest-edge breeding birds of central Illinois and northern Michigan and concluded that the populations of each area were distinct communities due to climate and vegetational change, again illustrating species of birds are restricted to habitats which fit their particular needs.

Parnell et al (1963), after a study of birds of an upland deciduous forest during the winter season in North Carolina, stated that there was a definite tendency for the smaller birds to occur in flocks, and

Cardinals were usually seen in single-species flocks feeding in the canopies of large tulip poplar trees.

Major changes in the habitat result in marked fluctuations in the avifauna as shown by Kendeigh and Brooks (1962) who stated that the death of elm trees in their study area eliminated the Rufous-sided Towhee from nesting in the woods due to the result of dense regrowth of vegetation in the plot.

Balda (1963) studied the breeding populations of birds of an upland forest and its edge in central Illinois and proposed that the change of the population was due to a change in the habitat because the death of elm trees opened the interior forest habitat up to the invasion of forest-edge species.

Haertel (1963) studied the breeding-bird populations in relation to the vegetation at Busey Woods, Urbana, Illinois, and concluded that the death of elm trees in the plot prompted the invasion of forest-edge species.

Case (1964) in a study to determine bird succession also stated the death of elms in his study plot at Allerton Park, Illinois, opened a more suitable habitat for woodpeckers in the forest interior.

Major changes due to climatic events likewise change the habitat which influences the avifauna of an area. Kendeigh and Barnett (1967) in a study of an oak-maple forest and forest-edge during the winter season stated that the heaviest sleet storm on record for the locality caused considerable pruning of branches, breaking off the tops of

many trees, and uprooting several trees. They proposed the destruction would retard the recovery of the forest and its bird population from damage done by the death of the elms from disease during the last one and a half decades.

The fact bird populations fluctuate continuously is illustrated by the studies of Kendeigh and Brooks (1962) who censused an oak-maple forest and edge during the winter months and stated that there was a large number of Ring-necked Pheasants which over-wintered in the woods while Red-headed Woodpeckers were entirely absent. They again censused the same area in the spring and summer of 1962 and found the numbers of most species were down. They also said the Red-headed Woodpecker invaded the area around the first of May but attained a population size of about one-half the size of a previous 1960 population size. They further concluded there was a decline in the House Wren population as great as the one in 1958 which followed severe winter weather in the southern states. They continued the census during the spring and summer months of 1963 and found the Red-headed Woodpecker after wintering in large numbers, reached the largest nesting population on record for the woods. They further stated the House Wren population was again low while the House Sparrow population that increased with the dying of the elm trees to a peak population of fifteen males in 1959 had progressively declined since then until only two were recorded nesting during this study. They further pointed to changes taking place in populations during a 1963 winter census when they found the

Ring-necked Pheasant population which wintered in the woods in large numbers during the previous year was greatly reduced at the termination of their census, possibly due to the predation of several Red Foxes denning in the woods. Furthermore, the Red-headed Woodpecker which was absent during the previous years winter census was the most abundant species in the woods except for the Tree Sparrows.

Barnett and Balda (1966) continued the oak-maple forest and edge study mentioned above during the spring and summer and found the number of territorial males of Blue Jays and Robins was higher than had previously been recorded for the area.

To further illustrate population changes continuously taking place Kendeigh and Barnett (1966) found that the Mourning Dove was absent from the study area for the first time in ten years. They further stated that the Starling population fluctuated with the weather and that they were found in larger numbers during this census than in any other. Fluctuations in populations again were seen by Kendeigh and Barnett (1967) when they found the bird populations were generally lower for the study area than for some time, particularly the Yellow-shafted Flicker, Red-headed Woodpecker, Downy Woodpecker, House Wren, and Starling.

Minor variations in bird populations were found by Kendeigh (1948) when he concluded there is an overlap in species termed forest-edge and forest-interior, such as the Indigo Bunting. Kendeigh also mentioned the density of the forest-edge population varied little from year to year while the forest-interior birds showed a general increase.

A different display of a fluctuating population was seen by Criswell and Miller (1965) when they censused an upland hardwood forest with scattered pine near Washington, D. C. during the winter season. They found that the Carolina Chickadee and Tufted Titmouse populations were of high concentration, confirming a previous prediction which stated the area seemed to show a rough cyclic variation and that, according to the shape of the curve of abundance, a high point could be expected during the year of their census,

METHODS OF POPULATION ANALYSIS: There is a variety of methods available to find bird populations. Wallace (1959) gave a list of types of counts used in field studies which included direct, block, and sample counts, as well as crowing, cooing, booming, drumming, killing, and sign. He continued with an account of instruments used in censusing, such as binoculars, mistnets, and spotting scopes, and further stated Peterson's (1960) Field Guide to the Birds was universally used.

In an extensive study Graber and Graber (1963) used methods of censusing and comparing bird populations in Illinois for 1906-1909 and 1956-58 from Kendeigh (1944) and Forbes (1907). The Grabers stated both were excellent reviews and discussions on bird measurement and professed that Forbes stated two observers "were sent into the field under instructions to traverse the state in various directions, traveling always in straight lines and always thirty yards apart, and noting and recording the species, numbers, and exact situation of all

birds flushed by them on a strip fifty yards in width, including also those crossing this strip within one hundred yards to their front. No attention was paid by them, for this purpose, to any other birds."

Graber and Graber (1963) further concluded censusing was started shortly after daybreak and continued until late afternoon. They pointed out no censuses were made during periods of inclement weather. They also recorded the distance traveled in each habitat by pacing, the date, time of day, locality, cloud condition, temperature, and the number of each species of bird in each habitat.

In view of the variety of methods available for bird studies, standardized procedures have been presented by Hall (1964) and Kolb (1965) for the breeding-bird counts and winter bird counts, respectively, that are published in the Audubon Field Notes. These procedures concerned selection and mapping the area, the manner of counting, time of census, and included model studies for correct publication form.

Peterka (1967) used the methods of Hall (1964) and Kolb (1965) in his study of bird populations of Burgner Acres.

Roth (1967) analyzed the avian succession on upland sites in Illinois and stated the best approach to it was through the use of a serial study.

MEASURING AND COMPUTING ABUNDANCE: Kendeigh (1944) compares and contrasts different types of methods used to measure bird populations. He proposed two methods for finding relative abundance which he stated showed the frequency with which the various species of birds had been noted by the observer: (1) find an index for

each species to permit comparison of relative abundance of different species or the same species of different areas, (2) find the actual number of birds of each species in an area of known size. The following people have used some of Kendeigh's procedures in the methods of their studies: Kendeigh (1948), Haertal (1963), Balda (1963), Roth (1967), Case (1964), Kendeigh and Brooks (1962-64), Barnett and Balda (1966), Kendeigh and Barnett (1966-67), and Borst (1967).

Kendeigh also used the measurement of birds per mile for species he found inhabiting the forest-edge. Examples of this type of measurement are found in publications by Kendeigh et al, on the oak-maple forest and its edge in the Audubon Field Notes from 1948 to date. He contended since forest-edge birds regularly went outside the woods for feeding, the density of their population was computed in terms of per mile of edge because different species of the forest-edge varied in the width of the edge niche utilized, making it difficult to compute their density on an acreage basis. Kendeigh (1944) further maintained a single observer could only census a small area during any one season and his results would be more exact and could be usable in a greater number of ways.

Frequency indices have been used to show relative abundance by dividing the number of days a species was observed by the total number of observation days and listing them in order of percent (Lindsdale, 1924-1937). He also used a change in yearly frequency indices as an indication of a change in the relative abundance of a bird. Dice (1930),

according to Kendeigh, also used frequency indices but based the percents on birds per hour of observation rather than birds per trip. Relative abundance, however, can show wide differences when several observers are giving the numbers of birds in flocks (Fisher, 1939). These variations are minimized by ranking birds as to abundant, common, moderately common, uncommon, and rare using 100%-90%, 89%-65%, 64%-31%, 30%-10%, 9%-1%, respectively (White, 1942).

The density of birds as presented by Hall (1964) and Kolb (1965) is determined by dividing the total number of birds for a species by the total number of observation trips to find the average number of birds per trip. The density of a species per one hundred acres is then determined by dividing the average number per trip by the total number of acres in the study area and multiplying by one hundred.

COMPARISONS OF POPULATIONS: Another difficulty in the evaluation of a bird population is to compare it with previous populations of the same area or of different areas. Odum (1950) presented a method which can be used to compare two avian populations. A percentage difference between two populations is calculated by dividing the differences in the total density per one hundred acres of two populations by the total number of birds in the two populations. If the Robin in area A had a density of ten birds per one hundred acres and the Robin in area B had a density of five birds, the difference between the two is five. If area A had fifteen crows per one hundred acres and area B had none, the difference between the two populations is fifteen. These differences are

then added and divided by the total average number of birds per one hundred acres for both areas which results in the percentage. Odum pointed out that a percentage difference of one hundred would indicate that the birds of the two areas were completely different and in no way similar. A percentage difference of less than fifty percent indicated a close similarity between the two populations. Odum's method of comparison has been used by a number of ornithologists (Haertal, 1962; Balda, 1963; Case, 1964; and Borst, 1967).

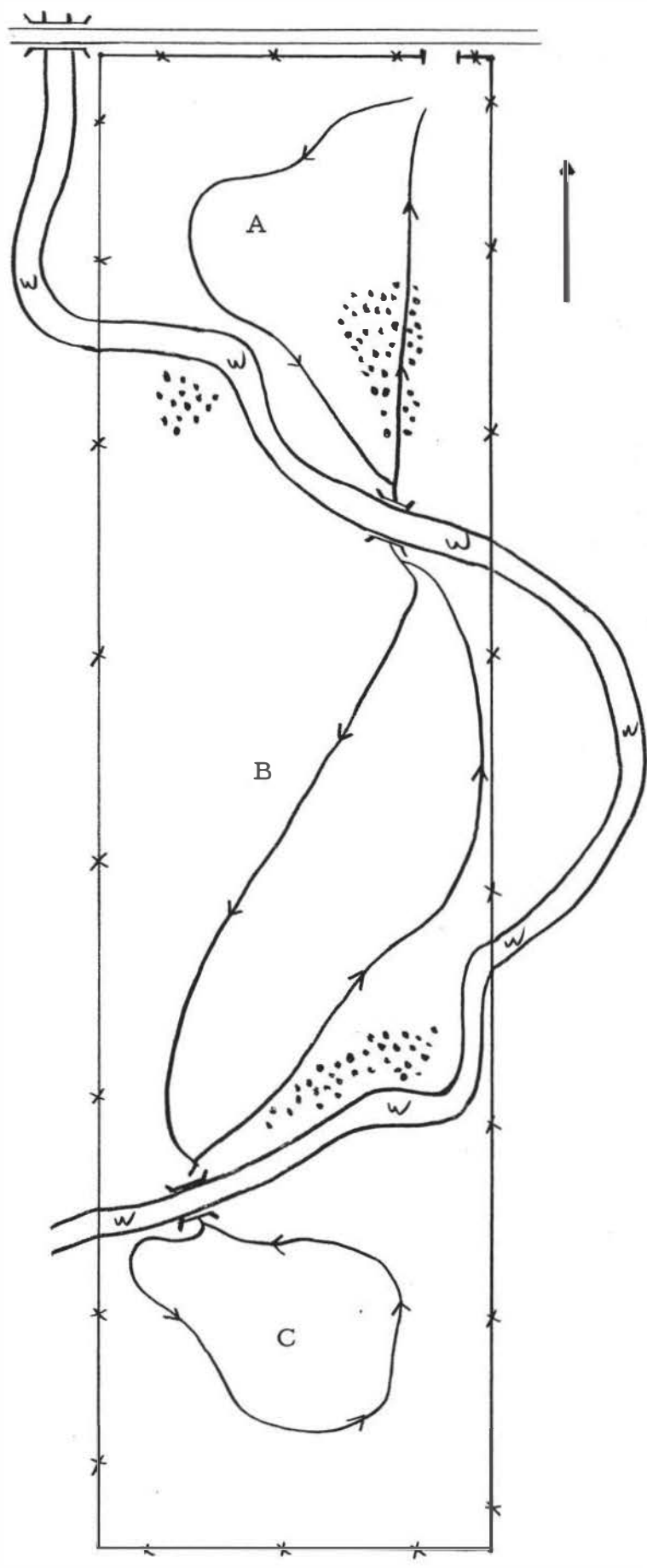
STUDY AREA

BURGNER ACRES: Burgner Acres (Figure 1) is an upland stream-side, ash-elm forest of about ten acres (338' x 1300' surveyed) with the forest edge including another ten acres (unmeasured). It is located in Coles County, eight miles northwest of Charleston, Illinois, Lafayette Township (NE1/4, Sec. 1, T12N, R8E).









The gently rolling topography has a maximum difference in elevation of about thirty feet, and the area is relatively well drained with the exception of two portions in the northern and middle sections (Figure 1). Sycamore Creek crosses Burgner Acres twice, dividing it into three well-defined areas: a once heavily mowed and moist area (A) which slopes gradually to Sycamore Creek, a somewhat less disturbed and moist area (B) which slopes to a second loop of the creek, and a partially disturbed higher and dryer area (C) (Henderson and Damann, 1966). Prior to its acquisition by Eastern Illinois University, much of the northern area (A) was frequently mowed and maintained in park-like fashion with the remainder disturbed by various degrees of cutting (Blackmore and Ebinger, 1967).

Henderson and Damann (1966) and Blackmore and Ebinger (1967) give excellent detailed descriptions on the vegetation of Burgner Acres with the former including an aerial photograph.

Figure 1. Outline Map of Burgner Acres, Coles County, Illinois.



LEGEND

-  Gate
-  Fence
-  Gravel Road
-  Creek
-  Bridge
-  Pathway
-  Moist Ground
- A = Area A
- B = Area B
- C = Area C
- 0 150
- 

According to Blackmore and Ebinger (1967), thirty-four woody species are present on the site with white ash (Flaxinus americana) being the leading dominant. Slippery elm (Ulmus rubra), shagbark hickory (Carya ovata), hackberry (Celtis occidentalis), and black walnut (Juglans nigra) followed in order of Importance Value Index. The number of dead elms and living elms indicate that Burgner Acres was once predominantly an elm forest. Area A contains a few scattered relatively large specimens of shagbark hickory, black walnut, and several others. Area B has an abundance of shagbark hickory, hackberry, white ash, young elms, and black walnut; while shagbark hickory, white ash, and mockernut hickory (Carya tomentosa) predominate in area C.

Shrubs found at Burgner Acres include: Indian Current (Symphoricarpos orbiculatus), elderberry (Sambucus canadensis), poison ivy (Rhus radicans), blackberry (Rubus spp.), and burning bush (Euonymus atropurpureus). Herbaceous plants include: bloodroot (Sanguinaria canadensis), dutchman's breeches (Dicentra cucullaria), spring beauty (Claytonia virginica), waterleaf (Hydrophyllum spp.), trout lily (Erythronium albidum), purple trillium (Trillium recurvatum), and bluebells (Mertensia virginica).

At the time this census was made the forest-edge was bordered by ungrazed pastures on the east and west, both divided by Sycamore Creek. The west side also contained a hedge row and scattered trees while the south end was adjacent to a wheat stubble field which was plowed in May, 1968. The north end was bordered by a gravel road which

separated Burgner Acres from a grazed pasture, which included a grove of trees and Sycamore Creek.

Burgner Acres, being surrounded by a variety of food sources, provided nesting sites and materials, an adequate water supply, and maintained unmolested by man, would seem to offer a favorable habitat for wildlife.

METHODS

The twenty-acre study area of Burgner Acres was mapped and a systematic route, at a slow steady walk around the forest-edge and through the forest-interior, was followed on each observation trip. All birds seen or heard while flying over, through, or perching in Burgner Acres were recorded to species, when possible, on field data cards. When a bird was not identified to species, it was recorded as "Owl sp." for example. The species and number of birds in each species were recorded and both totaled at the close of each trip. Attempts to sex, age, and group as to flock, single, etc., were taken along with general notations concerning the habitat and bird population. These data were then transferred to daily record sheets on the return to the laboratory at Eastern Illinois University. Retracing of steps was kept to a minimum; thus, avoiding a duplication of count. Wuest H-19, 8 x 40 binoculars and two field guides to the birds, Robbins, et al. (1966), and Peterson (1960), were used to aid observation and identification.

The periods of observation varied from one to six hours and took place throughout the day from early morning to evening; however, most occurred in the morning and lasted about two hours. Fifty-three observation trips were made from September 26, 1967 to June 13, 1968, with a total of one hundred and four hours of field censusing.

The data were recorded in three periods which coincided with the fall, winter, and spring seasons and tabulated accordingly. The fall census period was from September 26, 1967, to November 5, 1967, with twenty hours and fifteen minutes of field time; winter lasted from December 2, 1967, to March 19, 1968, with thirty-six hours of field time; and the spring period included March 26, 1968, through June 13, 1968, with forty-seven hours and fifty minutes of field time. The number of observation trips for the three periods was fifteen, twenty-two, and sixteen, respectively.

Data collected during each census period were analyzed with respect to:

$$A. \text{ Relative abundance} = \frac{\text{no. days seen}}{\text{total no. trips}} \times 100.$$

The relative abundance of birds observed was ranked: abundant (100%-90%), common (89%-65%), moderately common (64%-31%), uncommon (30%-10%), and rare (9%-1%).

$$B. \text{ Average number per trip} = \frac{\text{total no. each species}}{\text{total no. trips}}.$$

A "+" sign was used when the average number of birds per trip for a species was less than 0.5. When the average number of birds per trip and the density of a species per one hundred acres were written together, the latter was enclosed in parentheses.

$$C. \text{ Density per 100 acres} = \frac{\text{ave. no. per trip}}{\text{total acres}} \times 100.$$

$$D. \text{ Total average density per 100 acres} = \frac{\text{total of indiv. ave.}}{\text{total acres}} \times 100.$$

$$E. \text{ Percentage difference} = \frac{\text{total density per 100 acres difference}}{\text{total birds in both areas}} .$$

Comparisons of populations were made using the above formula described by Odum (1950). For example, if area A had ten Robins per one hundred acres and area B had five per one hundred acres, the difference is five, but if area A had six Red-tailed Hawks and area B had none the difference is six. A percentage difference of less than fifty percent was considered to be a close similarity between the populations. while one of one hundred percent indicated no relationship.

RESULTS AND DISCUSSION

The main points of investigation were to find the bird populations associated with Burgner Acres, Coles County, Illinois, the species, their densities per one hundred acres (D. /100), their relative abundance (Rel. Abund.) in terms of frequency of occurrence, and to compare the current data of Burgner Acres bird populations with previously obtained data from Burgner Acres (Peterka 1967) and Trelease Woods (Kendeigh and Barnett, 1966-67). The emphasis was on the winter bird population censuses since data on the fall and spring seasonal studies were not complete enough for accurate correlations to be made.

The data for the current study at Burgner Acres were collected separately during the fall, winter, and spring seasons. Dates were from September 26 to November 5, 1967, December 2, 1967, to March 22, 1968, and March 26 to June 13, 1968.

TRELEASE WOODS: The William Trelease Woods (formerly University Woods), is a prairie grove, maple-hackberry forest and forest-edge, located in central Illinois about five miles northeast of Urbana, Illinois, off route 150 in Champaign County, (SW1/4, Sec. 1, T19N, R9E). The topography is gently rolling with a maximum difference

in elevation of about sixteen feet (Boggess, 1964). Boggess further stated that there were numerous low areas where water stands during wet periods and were moist even in dry parts of the year. The wood-lot is surrounded by open farmland and is bordered by a road on the west side with the nearest stream being a tributary of the Salt Fork River which flows eastward about four hundred yards to the south. It is a rectangular tract used for research and educational purposes, and left for natural floral and faunal succession.

Boggess (1964) stated there were thirty-seven woody species with the sugar maple (Acer saccharum) being the leading dominant. Hackberry (Celtis occidentalis), white ash (Fraxinus americana), slippery elm (Ulmus rubra), basswood (Tilia americana), red oak (Quercus rubra), and buckeye (Aesculus glabra) followed in order of Importance Value Index. The pawpaw (Asimina triloba) and spice bush (Lindera benzoin) were the chief shrubs. Herbaceous plants included trillium (Trillium recurvatum), dutchman's breeches (Dicentra cucullaria), wild geranium (Geranium maculatum), blue phlox (Phlox divaricata), wild ginger (Asarum canadense), water-leaf (Hydrophyllum spp.), may apple (Podophyllum peltatum), woods nettle (Laportea canadensis), touch-me-nots (Impatiens pallida, I. biflora), bell-flower (Campanula americana), and white snakeroot (Eupatorium rugosum).

A recent visit to Trelease Woods verified the statements made by Boggess (1964). Areas in the interior were discovered where the moist soil was exposed; thus, debris and decaying leaves as stated by Kendeigh

(1948) did not cover the entire forest floor.

Bogges (1964) gave an excellent detailed description of the vegetation of Trelease Woods including past work by other people such as Twomey (1945), who presented a description of the habitat which was used by Kendeigh (1948).

FALL CENSUS 1967: Fifteen trips (Table 2) were taken to Burgner Acres during the fall census period with a total of twenty hours of observation time. Rain and snow fell on October 29 and November 3, 1967, respectively, while eleven days were cloudy and four were clear (Table 1).

The Bobwhite was spotted on September 26 and October 8, 1967, only (Table 2). On the latter date, there were eight birds in the covey which consisted of six young birds and two adults.

A total of forty-seven species were observed at Burgner Acres during the 1967 fall census (Table 3). Based on the class of resident status of Smith and Parmalee (1955) sixteen species observed were fall and spring migrants, fourteen were permanent residents, eleven summer residents, three winter residents and one was a spring migrant (Table 3).

One Yellow-billed Cuckoo was sighted on September 26, 1967, and was not seen again during the entire study period (Table 2). Smith and Parmalee (1955) stated that this bird is a summer resident (Table 3); thus, the fact was obvious that the bird would depart either late in the summer or early in the fall as it did.

The Marsh Hawk, a spring migrant, and the Redwinged Blackbird,

a summer resident, were noticed as late as October 25 and November 2, 1967, respectively (Table 2). The resident status placed on the species by Smith and Parmalee (1955) may not always hold true possibly due to very mild weather which may induce the bird to stay in a particular area.

The total average D. /100 for the 1967 fall census was two hundred and ninety-five birds (Table 4). There were ten rare species, twenty-three uncommon, ten moderately common, three common, and one abundant for the census period (Table 5).

The Blue Jay had a D. /100 of twenty birds and was preceded by the Canada Goose (65), Mourning Dove (3), Robin (25), and White-throated Sparrow (25) (Table 4). On the other hand, the Blue Jay had a Rel. Abund. of one hundred percent and proceeded the birds previously mentioned (Table 5). It was obvious that the Blue Jay was seen on the greatest number of trips but did not have the greatest D. /100. Possibly those birds which had the greater D. /100, but were not sighted as many times as the Blue Jay, were observed one or two times in great numbers or were less active; thus, not spotted. The Canada Goose was seen only two times in two large flocks which gave them the greatest D. /100 which probably created a false impression of the fall census for Burgner Acres because the geese merely passed over and did not stop there.

The Robin was listed as uncommon (Table 5), as was the Canada Goose, because it was seen only four times out of fifteen observation trips, but on one trip, fifty had been spotted (Table 2) which gave it a high D. /100 (25) for the fall census (Table 4).

The fact is clear from the difficulty encountered in figuring the abundance of birds for a given area, that those with the most abundant ratings are not always the birds with the greatest numbers. The converse is also true. The feeling is that the Rel. Abund. based on frequency of occurrence (Freq. Occur.) of a species should be included in census results so that it may be compared with the D. / 100 which would represent the quantity of birds. This would then allow correlations between Freq. Occur. and quantity of the same or different species. Possibly the bird which had a low D. / 100 (Red-bellied Woodpecker, Table 4) and a high Freq. Occur. (Table 5) utilized Burgner Acres more than the bird with a high D. / 100 (Robin, Table 4) and seen only one or two times (Table 5).

Pine and Prairie Warblers seen during the 1967 fall census were not sighted in the 1964 and 1965 fall censuses (Peterka, 1967). The last warblers were viewed on November 4, 1967, which was a later date than during the 1964 fall census when the last one was seen on October 27, 1964. In the 1965 fall census, the last warbler was seen October 29, a date which coincided with the same occurrence in 1964. The feeling was that the warblers would have been overlooked during fall, 1967; thus resulting in an earlier, last-seen date, or that possibly the weather was a little more favorable for the 1967 census and detained the departure of the warblers.

The Golden-crowned Kinglet stayed at Burgner Acres until November 2, 1967, which is an earlier departure than that of the 1964 census, which was November 20, 1964. It was not present during the fall 1965 census.

Table 1. Climatic data from fall 1967 to spring 1968 for Coles County, Illinois. H = high; L = low; Avg. = average

Date	Temperature			General Conditions
	H.	L.	Avg.	
9/26/67	81	57	69	Sunny
9/28/67	56	40	48	Cloudy, windy
10/ 3/67	84	56	70	Slightly cloudy, breeze
10/ 4/67	80	62	71	No clouds, slight breeze
10/12/67	63	37	50	No clouds, no wind
10/15/67	82	57	70	Some clouds, slight breeze
10/18/67	58	40	49	No clouds, windy, dew present
10/23/67	74	49	62	Slightly cloudy, breeze
10/25/67	50	41	46	Cloudy, windy, cold
10/27/67	52	35	44	Slightly cloudy and windy
10/29/67	62	36	49	Rain, windy, cloudy
11/ 2/67	51	41	46	Cloudy, slight wind, ground wet
11/ 3/67	48	34	41	Snow, cloudy
11/ 4/67	37	26	32	Cloudy, windy, ground wet
11/ 5/67	36	26	31	Slightly cloudy
12/ 2/67	45	35	40	Slightly cloudy, breeze, ground wet
12/ 4/67	40	29	35	Slightly cloudy and windy
12/ 6/67	51	42	47	Cloudy
12/13/67	42	34	38	Cloudy, slight breeze
12/18/67	53	42	48	Slightly cloudy, slight breeze, ground wet

Table 1. (Continued)

Date	Temperature			General Conditions
	H.	L.	Avg.	
12/23/67	27	13	20	Sunny, windy, cold
12/28/67	24	10	17	Sunny, still, snow on ground
1/ 4/68	15	4	10	Sunny, very windy, snow on ground
1/12/68	30	22	26	Cloudy, frost on ground
1/17/68	38	16	27	Sunny, snow on ground melting
1/24/68	28	12	20	Sunny, some snow on ground
1/26/68	46	26	37	Sunny, some snow, slight wind
1/31/68	53	38	46	Cloudy, mist, ground soft and wet
2/ 5/68	47	30	39	Sunny, clear, breeze
2/ 7/68	41	24	33	Sunny, clear, breeze
2/11/68	22	5	14	Windy, snow on ground
2/13/68	27	9	13	Snow on ground, slight breeze
2/22/68	31	3	17	Snow on ground, slight breeze
2/28/68	40	27	34	Sunny, slight breeze, ground frozen
3/ 5/68	56	35	46	Cloudy, windy, ground frozen
3/19/68	65	42	54	Overcast, southerly breeze, thawing
3/22/68	33	29	31	Overcast, windy
3/26/68	74	45	60	Clear, windy
4/ 9/68	67	42	55	Sunny, clear
4/11/68	72	44	58	Sunny, breeze

Table 1. (Continued)

Date	Temperature			General Conditions
	H.	L.	Avg.	
4/16/68	63	44	49	Sunny, breeze
4/18/68	65	48	57	Overcast
4/23/68	69	48	59	Sunny, windy
4/25/68	62	35	49	Sunny
4/28/68	68	47	58	Sunny
4/30/68	79	50	65	Sunny, breeze
5/ 1/68	83	60	72	Sunny, dew, breeze
5/ 4/68	72	45	57	No clouds, sunny
5/ 9/68	75	47	61	Overcast, wet ground
5/10/68	59	44	52	Sunny, dew
5/14/68	82	64	73	Sunny, clear
5/16/68	80	57	69	Clear
6/13/68	80	52	66	Sunny, breeze

Table 2. Fall 1967 census of birds at Burgner Acres, Coles County, Illinois, based on the date first seen and the number observed on each date.

Species	Month	September					October						November				Total
	Day	26	28	3	4	12	15	18	23	25	27	29	2	3	4	5	
Bobwhite		2						8									10
Mourning Dove		1	4	14	30		3		30	2	15	1	10	1	5		116
Yellow-billed Cuckoo		1															1
Red-bellied Woodpecker		4	3	1	2	1			1	1		3		1	1		18
Red-headed Woodpecker		2		1													3
Downy Woodpecker		2	1		2	1			1		1	4		1			13
Flycatcher sp.		2			2												4
Blue Jay		8	8	7	6	4	5	6	2	3	4	3	3	1	2	1	63
Black-capped Chickadee		3							4	1				4			12
Black-and-white Warbler		1															1
Myrtle Warbler		1						10	24	2	3	3		6			49
Pine Warbler		3															3
White-throated Sparrow		3		4		7	9	13	3	3	8	7	6	6			69
Yellow-shafted Flicker			1	8	5	5	2	4		1	4					1	31
Eastern Wood Pewee			1		1												2
Brown Creeper			1			2	1			1	1			1			7
Hermit Thrush			2					1		1	2		4	3	1		14
Eastern Bluebird			6								1						7
Cardinal			2			2				1	3	2				2	12
Marsh Hawk				1						1							2
Chimney Swift				4		1											5
Yellow-bellied Sapsucker				1	2		1				1						5
Scarlet Tanager				1													1

Table 2. (Continued)

Species	Month	September					October						November				Total
	Day	26	28	3	4	12	15	18	23	25	27	29	2	3	4	5	
Red-tailed Hawk					1	1		1	1	1	6	1					12
Rock Dove					2												2
Ruby-crowned Kinglet					7		1	4	3	1	3	1	1	2			23
Prairie Warbler					1												1
Eastern Meadowlark					5	1											6
Redwinged Blackbird					15			1					20				36
Common Grackle					3		3			1							7
Eastern Phoebe						1						1					2
House Wren						3						1					4
Wood Thrush						1											1
Golden-crowned Kinglet						2					3					2	7
Robin								50	12	7					1		70
Common Crow								1		2	1		1				5
Slate-colored Junco								5	3	20	10				5		43
Tufted Titmouse									5		2				2		9
Fox Sparrow										3				1	3		7
Song Sparrow										3	4	2	3	1	6		19
Canada Goose											40				80		120
Owl sp.											1						1
Winter Wren											1	1					2
House Sparrow												30	4			1	35
Hairy Woodpecker													1				1
Black-throated Green Warbler															5		5
American Goldfinch															7		7
Total Species		13	10	10	15	14	7	13	10	15	21	17	11	7	16	8	
Total Individuals		33	29	42	84	32	24	105	58	79	97	76	47	25	128	14	873

Table 3. Birds observed fall, September 26, to November 5, 1967, at Burgner Acres, Coles County, Illinois, in phylogenetic order with resident status.*

1. Canada Goose, M
2. Red-tailed Hawk, M, WR
3. Marsh Hawk, SPM
4. Bobwhite, PR
5. Rock Dove, PR
6. Mourning Dove, PR
7. Yellow-billed Cuckoo, SR
8. Owl sp.
9. Chimney Swift, SR
10. Yellow-shafted Flicker, SR
11. Red-bellied Woodpecker, PR
12. Red-headed Woodpecker, SR
13. Yellow-bellied Sapsucker, M
14. Hairy Woodpecker, PR
15. Downy Woodpecker, PR
16. Eastern Phoebe, M
17. Eastern Wood Pewee, SR
18. Flycatcher sp.
19. Blue Jay, PR
20. Common Crow, PR
21. Black-capped Chickadee, WR
22. Tufted Titmouse, PR
23. Brown Creeper, WR
24. House Wren, SR
25. Winter Wren, M
26. Robin, PR
27. Wood Thrush, SR
28. Hermit Thrush, M
29. Eastern Bluebird, SR
30. Golden-crowned Kinglet, M
31. Ruby-crowned Kinglet, M
32. Black-and-white Warbler, M
33. Myrtle Warbler, M
34. Black-throated Green Warbler, M
35. Pine Warbler, M
36. Prairie Warbler, M
37. House Sparrow, PR
38. Eastern Meadowlark, SR
39. Redwinged Blackbird, SR
40. Common Grackle, SR

Table 3. (Continued)

41. Scarlet Tanager, M
42. Cardinal, PR
43. American Goldfinch, PR
44. Slate-colored Junco, WR
45. White-throated Sparrow, M
46. Fox Sparrow, M
47. Song Sparrow, PR

*

PR = Permanent Resident

SR = Summer Resident

WR = Winter Resident

M = Spring and Fall Migrant

SPM = Spring Migrant

FM = Fall Migrant

Table 4. Density of fall species, September 26, to November 5, 1967, in decreasing abundance, for Burgner Acres, Coles County, Illinois.

Species	Ave. No. Birds per Trip	Density per 100 Acres
Canada Goose	13	65
Mourning Dove	8	30
Robin	5	25
White-throated Sparrow	5	25
Blue Jay	4	20
Myrtle Warbler	3	15
House Sparrow	3	15
Slate-colored Junco	3	15
Yellow-shafted Flicker	2	10
Ruby-crowned Kinglet	2	10
Redwinged Blackbird	2	10
Red-tailed Hawk	1	5
Bobwhite	1	5
Red-bellied Woodpecker	1	5
Downy Woodpecker	1	5
Black-capped Chickadee	1	5
Tufted Titmouse	1	5
Hermit Thrush	1	5
Cardinal	1	5

Table 4. (Continued)

Species	Ave. No. Birds per Trip	Density per 100 Acres
Song Sparrow	1	5
Marsh Hawk	+ ^a	
Rock Dove	+	
Yellow-billed Cuckoo	+	
Owl sp.	+	
Chimney Swift	+	
Red-headed Woodpecker	+	
Yellow-bellied Sapsucker	+	
Hairy Woodpecker	+	
Eastern Phoebe	+	
Eastern Wood Phoebe	+	
Flycatcher sp.	+	
Common Crow	+	
Brown Creeper	+	
House Wren	+	
Winter Wren	+	
Wood Thrush	+	
Eastern Bluebird	+	
Golden-crowned Kinglet	+	
Black-and-white Warbler	+	

Table 4. (Continued)

Species	Ave. No. Birds per Trip	Density per 100 Acres
Black-throated Green Warbler	+	
Pine Warbler	+	
Prairie Warbler	+	
Eastern Meadowlark	+	
Common Grackle	+	
Scarlet Tanager	+	
American Goldfinch	+	
Fox Sparrow	+	
Total average per trip - 59 birds		
Total average density per 100 acres - 295 birds		

^a0.5 or less

Table 5. Relative abundance in terms of frequency of occurrence of birds observed at Burgner Acres, Coles County, Illinois, fall (September 26, to November 5, 1967).

Species	No. Times Observed ^a	Relative Abundance ^b
Blue Jay	15	100% (A)
Mourning Dove	12	80% (C)
White-throated Sparrow	11	74% (C)
Red-bellied Woodpecker	10	67% (C)
Yellow-shafted Flicker	9	60% (MC)
Ruby-crowned Kinglet	9	60% (MC)
Downy Woodpecker	8	53% (MC)
Red-tailed Hawk	7	47% (MC)
Hermit Thrush	7	47% (MC)
Myrtle Warbler	7	47% (MC)
Brown Creeper	6	40% (MC)
Cardinal	6	40% (MC)
Song Sparrow	6	40% (MC)
Slate-colored Junco	5	33% (MC)
Yellow-bellied Sapsucker	4	27% (UC)
Common Crow	4	27% (UC)
Black-capped Chickadee	4	27% (UC)
Robin	4	27% (UC)
Tufted Titmouse	3	20% (UC)

Table 5. (Continued)

Species	No. Times Observed ^a	Relative Abundance ^b
Golden-crowned Kinglet	3	20% (UC)
Redwinged Blackbird	3	20% (UC)
Common Grackle	3	20% (UC)
House Sparrow	3	20% (UC)
Fox Sparrow	3	20% (UC)
Canada Goose	2	14% (UC)
Marsh Hawk	2	14% (UC)
Bobwhite	2	14% (UC)
Rock Dove	2	14% (UC)
Chimney Swift	2	14% (UC)
Red-headed Woodpecker	2	14% (UC)
Eastern Phoebe	2	14% (UC)
Eastern Wood Pewee	2	14% (UC)
Flycatcher sp.	2	14% (UC)
House Wren	2	14% (UC)
Winter Wren	2	14% (UC)
Eastern Bluebird	2	14% (UC)
Eastern Meadowlark	2	14% (UC)
Yellow-billed Cuckoo	1	7% (R)
Owl sp.	1	7% (R)

Table 5. (Continued)

Species	No. Times Observed ^a	Relative Abundance ^b
Hairy Woodpecker	1	7% (R)
Wood Thrush	1	7% (R)
Black-and-white Warbler	1	7% (R)
Black-throated Green Warbler	1	7% (R)
Pine Warbler	1	7% (R)
Prairie Warbler	1	7% (R)
Scarlet Tanager	1	7% (R)
American Goldfinch	1	7% (R)

^a Total observation period was 15 trips

^b (A) = Abundant
 (C) = Common
 (MC) = Moderately Common
 (UC) = Uncommon
 (R) = Rare

WINTER CENSUS 1967-68: Twenty-two trips (Table 6) were taken to Burgner Acres during the winter census period with a total of thirty-six hours of observation time. Ten days were overcast and twelve were clear while snow was on the ground during eight of the days (Table 1).

The Yellow-shafted Flicker and Eastern Meadowlark were noticed throughout the winter census (Table 6). These two species are considered summer residents by Smith and Parmalee (1955) (Table 7).

There were twenty permanent residents, five winter residents, five summer residents, and one spring and fall migrant observed during the 1967-68 winter bird population census (Table 7) opposed to nineteen permanent residents, six winter residents, and seven birds which usually migrate but did not for 1964-65. There were seventeen permanent residents, four winter residents, and eleven migrants for the 1965-66 census. Possibly the birds seen during the winter at Burgner Acres which were supposed to be summer residents could be birds which had migrated from areas further north and those birds which were observed at Burgner Acres had moved south.

The total average D. / 100 for the 1967-68 winter census was three hundred and five birds (Table 8). There were five abundant, three common, seven moderately common, ten uncommon, and eight rare species seen at Burgner Acres (Table 9). The Mourning Dove had the greatest D. / 100 for the period (Table 8) and was observed twenty times out of twenty-two trips (Table 9).

The densities for several birds observed at Burgner Acres for the last few years have changed considerably (Table 15). The Mourning

Dove had a D. /100 of one hundred and fifteen birds for 1967-68 as contrasted with twenty for 1965-66 and fifty for 1964-65. The Common Crow had a D. /100 of eight-five birds for the 1964-65 winter census as opposed to a D. /100 of ten for the 1967-68 winter census (Table 10). It was not seen at all during the 1965-66 census. The Tree Sparrow varied from a D. /100 of fifty birds for 1964-65 to one hundred and forty-five for 1965-66 and had a D. /100 of ten birds for 1967-68 (Table 10). The feeling is that the area should be studied further before any reasons are given for this high degree of variability in the densities of the birds previously mentioned.

Even though there was a great variation in the densities of some species, the total average D. /100 of the winter censuses for the three years had a range of only eighty-five birds while the average for the three years was three hundred and twenty birds per one hundred acres. (Table 10).

The Rough-legged Hawk, Marsh Hawk, Great-horned Owl, Winter Wren, Carolina Wren, Cedar Waxwing, Purple Finch, and Pine Siskin were not seen this year but had been counted in the previous studies (Table 10). In addition, eight species, which had not been witnessed during the previous two winter studies, were seen this year (Table 10).

The percentage differences between the 1964-65 winter bird population and the 1965-66 population was forty-nine percent. It was calculated as follows: percent diff. = $\frac{\text{Total difference in D. /100}}{\text{Total birds for both species.}}$

The percentage difference between the 1964-65 population and 1967-68 population was fifty-three percent, while there was a fifty-one percent difference between the 1965-66 and 1967-68 populations. Odum (1950) stated a percentage difference of fifty percent or less indicated a close similarity. The winter bird populations at Burgner Acres from 1964 to 1968 probably had not changed in degree of similarity. This could be due to the fact that the vegetation remained relatively constant.

If the density variation of the Common Crow, Mourning Dove, and Tree Sparrow had been more uniform during the three years which were censused, then the percentage differences might have appeared lower which could have resulted in even closer similarities among the bird populations. The rest of the winter birds remained relatively the same in D. / 100 for the three years of investigation (Table 10). This variation was not encountered with the populations at Trelease Woods, Champaign, County, Illinois.

The winter bird populations for 1965-66 and 1966-67 seemed to be relatively uniform for the two winter seasons. The Ring-necked Pheasant showed an increase from two birds per one hundred acres to sixteen birds for 1965-66 and 1966-67, respectively (Table 11). Kendeigh and Barnett (1966) stated that the Mourning Dove was absent for the first time in ten years. They further stated that the Starling population fluctuated with the weather but that their numbers were greater than ever before. They observed one Oregon Junco during the 1965-66 winter bird census. Furthermore, Kendeigh and Barnett

(1967) pointed out that the heaviest sleet storm on record pruned many trees and caused destruction which added to the damage done by the loss of diseased elms during the last one and one-half decades would retard the recovery of the forest and its bird population.

The Red-headed Woodpecker, Ring-necked Pheasant, and Yellow-shafted Flicker had greater D. /100 for 1966-67 than for 1965-66 in Trelease Woods (Table 11). The percentage difference for the two populations was forty-one percent which indicated a close similarity.

The percentage difference between the winter bird populations at Trelease Woods for two years (1965-66, 1966-67) and Burgner Acres for three years (1964-65, 1965-66, and 1967-68) was fifty-two percent (Table 12). Possibly these two areas were similar to a relatively close degree since Odum (1950) points out that a percentage difference of fifty percent or less indicates a high degree of relationship.

The percentage difference for the winter bird populations between Burgner Acres and Trelease Woods was approximately the same as the percentage difference between the winter bird populations at Burgner Acres for the three winter seasons studied. Furthermore, the total average D. /100 for the winter bird population of Burgner Acres (320) was greater than that of Trelease Woods (258) (Tables 10 and 11, respectively). Graber and Graber (1963) stated that the southern zone which they designated in their study had more birds than did the central and northern zones. Trelease Woods falls in the central zone; thus, this comparison supports the Graber's statement.

Table 6. Winter 1967-68 census of birds at Burgner Acres, Coles County, Illinois, based on the date first seen and the number observed on each date.

Species	Month	December							January					February					March			Total		
	Day	2	4	6	13	18	23	28	4	12	17	24	26	31	5	7	11	13	22	28	5		19	22
Mourning Dove		50	1	30	35	40	45	25	20	10		40	40	10	15	30	1		15	35	35	6	20	503
Yellow-shafted Flicker		2				1	1				3	3	2	1	1			1	1		1	2		20
Red-bellied Woodpecker		5	3	1	2	1	3	1	1	3	3	4	2	3	2	2	1	1	2	2	2	1	1	46
Downy Woodpecker		4		1	3	2	3	1	1			2	2	2		2		1		1	2	1	1	29
Blue Jay		8	6	2	4	5	1		2	4	2	5	3	4	2	6		3	4	6	5	5	5	82
Common Crow		5	1	1	2	2	1		2	2	3	4	3	2	3	1	1	1	3	2		2		41
Tufted Titmouse		3			2							1		1				1		4	2	2		16
Starling		35	2		12				1	2	2		3	20		1			10	2	5	25	1	121
House Sparrow		10			1	5						6			3			10		3	10	1	10	59
Eastern Meadowlark		4	3		1	1								1	1	2	5		2	1	2	2	1	26
Cardinal		4	1			4	1			2	3	1	1	6	2	4	2	1	2	4	1	6	1	46
American Goldfinch		5	8	1		6			5			1			1			12	1		3	3		46
Slate-colored Junco		5	2			12	10	2	8	5	10	2	5	6	4	8	3	5	20	6	7	9	5	134
Tree Sparrow		10		1				3		3				5		3	6	9						40
Song Sparrow		3	4	2	1	5	1	3	1	5	5	4	3	1	12	8	6	3	8	7	6	9	3	100
Black-capped Chickadee					3											2						1	3	9
Brown Creeper					2																			2
Sparrow Hawk						1																		1
Rock Dove							2					1												3
Red-tailed Hawk								1			1								1			1		4

Table 6. (Continued)

Species	Month	December							January						February					March			Total	
	Day	2	4	6	13	18	23	28	4	12	17	24	26	31	5	7	11	13	22	28	5	19		22
Horned Lark							5								1	4								10
Bobwhite								6					1								1	2		10
Owl sp.										1														1
Hairy Woodpecker												1							1	2	1			5
Robin														3	5						3	2		13
Ring-necked Pheasant															1			1	1					3
Common Grackle															3						6	2	6	17
Barn Owl																		1						1
Carolina Chickadee																	2							2
Mockingbird																					2			2
Eastern Bluebird																						1		1
Redwinged Blackbird																					2	1		3
Fox Sparrow																						1		1
Total Species		15	10	8	12	13	10	8	10	10	9	14	10	15	11	16	9	15	12	16	14	23	17	
Total Individuals		153	31	39	68	85	68	41	47	39	32	74	63	64	48	79	26	43	80	77	86	88	66	1397

Table 7. Birds observed winter, December 2, 1967, to March 22, 1968, at Burgner Acres, Coles County, Illinois, in phylogenetic order with resident status.*

1. Red-tailed Hawk, M, WR
2. Sparrow Hawk, PR
3. Bobwhite, PR
4. Ring-necked Pheasant, PR
5. Rock Dove, PR
6. Mourning Dove, PR
7. Barn Owl, PR
8. Owl sp.
9. Yellow-shafted Flicker, SR
10. Red-bellied Woodpecker, PR
11. Hairy Woodpecker, PR
12. Downy Woodpecker, PR
13. Horned Lark, PR
14. Blue Jay, PR
15. Common Crow, PR
16. Black-capped Chickadee, PR
17. Carolina Chickadee, PR
18. Tufted Titmouse, PR
19. Brown Creeper, WR
20. Mockingbird, M, WR
21. Robin, PR
22. Eastern Bluebird, SR
23. Starling, PR
24. House Sparrow, PR
25. Eastern Meadowlark, SR
26. Redwinged Blackbird, SR
27. Common Grackle, SR
28. Cardinal, PR
29. American Goldfinch, PR
30. Slate-colored Junco, WR
31. Tree Sparrow, WR
32. Fox Sparrow, M
33. Song Sparrow, PR

- * PR = Permanent Resident
 SR = Summer Resident
 WR = Winter Resident
 M = Spring and Fall Migrant
 SPM = Spring Migrant
 FM = Fall Migrant

Table 8. Density of winter species, December 2, 1967, to March 22, 1968, in decreasing abundance, for Burgner Acres, Coles County, Illinois.

Species	Ave. No. Birds per Trip	Density per 100 Acres
Mourning Dove	23	115
Slate-colored Junco	6	30
Starling	5	25
Blue Jay	4	20
Song Sparrow	4	20
House Sparrow	3	15
Red-bellied Woodpecker	2	10
Common Crow	2	10
Cardinal	2	10
American Goldfinch	2	10
Tree Sparrow	2	10
Bobwhite	1	5
Yellow-shafted Flicker	1	5
Downy Woodpecker	1	5
Tufted Titmouse	1	5
Robin	1	5
Eastern Meadowlark	1	5
Red-tailed Hawk	+ ^a	
Sparrow Hawk	+	

Table 8. (Continued)

Species	Ave. No. Birds per Trip	Density per 100 Acres
Ring-necked Pheasant	+	
Rock Dove	+	
Barn Owl	+	
Owl sp.	+	
Hairy Woodpecker	+	
Horned Lark	+	
Black-capped Chickadee	+	
Carolina Chickadee	+	
Brown Creeper	+	
Mockingbird	+	
Eastern Bluebird	+	
Redwinged Blackbird	+	
Common Grackle	+	
Fox Sparrow	+	
Total average per trip - 61 birds		
Total average density per 100 acres - 305 birds		

^a0.5 or less

Table 9. Relative abundance in terms of frequency of occurrence of birds observed at Burgner Acres, Coles County, Illinois, winter (December 2, 1967, to March 22, 1968).

Species	No. Times Observed ^a	Relative Abundance ^b
Red-bellied Woodpecker	22	100% (A)
Song Sparrow	22	100% (A)
Mourning Dove	20	91% (A)
Blue Jay	20	91% (A)
Slate-colored Junco	20	91% (A)
Common Crow	19	87% (C)
Cardinal	18	82% (C)
Downy Woodpecker	16	73% (C)
Starling	14	64% (MC)
Eastern Meadowlark	14	64% (MC)
Yellow-shafted Flicker	13	59% (MC)
American Goldfinch	11	50% (MC)
House Sparrow	10	46% (MC)
Tufted Titmouse	8	36% (MC)
Tree Sparrow	8	36% (MC)
Red-tailed Hawk	4	18% (UC)
Bobwhite	4	18% (UC)
Hairy Woodpecker	4	18% (UC)
Black-capped Chickadee	4	18% (UC)

Table 9. (Continued)

Species	No. Times Observed ^a	Relative Abundance ^b
Robin	4	18% (UC)
Common Grackle	4	18% (UC)
Ring-necked Pheasant	3	14% (UC)
Horned Lark	3	14% (UC)
Rock Dove	2	9% (UC)
Redwinged Blackbird	2	9% (UC)
Sparrow Hawk	1	5% (R)
Barn Owl	1	5% (R)
Owl sp.	1	5% (R)
Carolina Chickadee	1	5% (R)
Brown Creeper	1	5% (R)
Mockingbird	1	5% (R)
Eastern Bluebird	1	5% (R)
Fox Sparrow	1	5% (R)

^aTotal observation period was 22 trips

^b(A) = Abundant
 (C) = Common
 (MC) = Moderately Common
 (UC) = Uncommon
 (R) = Rare

Table 10. Density and species comparison of the winter bird populations at Burgner Acres, Coles County, Illinois, in phylogenetic order.

Species	1964-65 ^a	1965-66 ^b	1967-68	Average
Red-tailed Hawk	+ ^c	+	+	+
Rough-legged Hawk	+	0 ^d	0	+
Marsh Hawk	+	+	0	+
Sparrow Hawk	+	+	+	+
Bobwhite	+	0	1 (5) ^e	+
Ring-necked Pheasant	+	+	+	+
Rock Dove	0	0	+	+
Mourning Dove	10 (50)	4 (20)	23 (115)	12 (60)
Barn Owl	0	0	+	+
Great Horned Owl	+	+	0	+
Owl sp.	0	0	+	+
Yellow-shafted Flicker	+	+	1 (5)	+
Red-bellied Woodpecker	3 (15)	1 (5)	2 (10)	2 (10)
Hairy Woodpecker	+	0	+	+
Downy Woodpecker	2 (10)	0	1 (5)	3 (15)
Horned Lark	+	0	+	+
Blue Jay	3 (15)	4 (20)	4 (20)	4 (20)
Common Crow	17 (85)	0	2 (10)	6 (30)
Black-capped Chickadee	0	0	+	+

Table 10. (Continued)

Species	1964-65 ^a	1965-66 ^b	1966-67	Average
Carolina Chickadee	0	0	+	+
Tufted Titmouse	2 (10)	0	1 (5)	1 (5)
Brown Creeper	1 (5)	1 (5)	+	1 (5)
Winter Wren	0	+	0	+
Carolina Wren	+	+	0	+
Robin	1 (5)	+	1 (5)	1 (5)
Eastern Bluebird	0	0	+	+
Cedar Waxwing	+	+	0	+
Starling	2 (10)	6 (30)	5 (25)	4 (20)
House Sparrow	3 (15)	8 (40)	3 (15)	5 (25)
Eastern Meadowlark	+	3 (15)	1 (5)	1 (5)
Redwinged Blackbird	+	+	+	+
Common Grackle	0	0	+	+
Cardinal	2 (10)	1 (5)	2 (10)	2 (10)
Purple Finch	0	+	0	+
Pine Siskin	0	+	0	+
American Goldfinch	2 (10)	3 (15)	2 (10)	2 (10)
Slate-colored Junco	3 (25)	3 (15)	6 (30)	4 (20)
Tree Sparrow	10 (50)	29 (145)	2 (10)	14 (70)

Table 10. (Continued)

Species	1964-65 ^a	1965-66 ^b	1966-67	Average
Fox Sparrow	0	0	+	+
Song Sparrow	2 (10)	7 (35)	4 (20)	4 (20)
Total Average Birds per Trip	68 birds	78 birds	61 birds	64 birds
Total Average Density per 100 Acres	340 birds	390 birds	305 birds	320 birds
Total Species	29	25	32	

^{a, b} From Peterka, 1967

^c 0.5 or less

^d Not seen

^e Average No. / Trip (Density/100 Acres)

Table 11. Density and species comparison of the winter bird populations at Trelease Woods, Champaign County, Illinois, in phylogenetic order (Kendeigh and Barnett, 1966-67).

Species	1965-66	1966-67	Average
Red-tailed Hawk	0 ^a	1 (2) ^c	+ ^b
Rough-legged Hawk	0	+	+
Bobwhite	0	1 (2)	+
Ring-necked Pheasant	1 (2)	9 (16)	5 (9)
Mourning Dove	0	+	+
Great Horned Owl	1 (2)	1 (2)	1 (2)
Yellow-shafted Flicker	1 (2)	2 (4)	2 (4)
Red-bellied Woodpecker	4 (7)	2 (4)	3 (5)
Red-headed Woodpecker	11 (20)	18 (33)	15 (27)
Hairy Woodpecker	2 (4)	1 (2)	2 (4)
Downy Woodpecker	5 (9)	3 (5)	4 (7)
Blue Jay	9 (16)	6 (11)	7 (13)
Common Crow	+	+	+
Carolina Chickadee	2 (4)	0	1 (2)
Tufted Titmouse	2 (4)	1 (2)	2 (4)
White-breasted Nuthatch	2 (4)	1 (2)	2 (4)
Brown Creeper	2 (4)	1 (2)	2 (4)
Robin	0	1 (2)	+
Golden-crowned Kinglet	+	0	+

Table 11. (Continued)

Species	1965-66	1966-67	Average
Starling	47 (85)	42 (77)	45 (82)
House Sparrow	1 (2)	1 (2)	1 (2)
Rusty Blackbird	+	0	+
Cardinal	2 (4)	1 (2)	2 (4)
American Goldfinch	+	3 (5)	2 (4)
Slate-colored Junco	12 (22)	7 (13)	10 (18)
Oregon Junco	+	0	+
Tree Sparrow	40 (73)	26 (47)	33 (60)
Swamp Sparrow	1 (2)	0	+
Song Sparrow	6 (11)	0	3 (5)
Total Average Birds per Trip	151 birds	128 birds	142 birds
Total Average Density per 100 Acres	274 birds	231 birds	258 birds
Total Species	24	23	

^a Not Seen

^b 0.5 or less

^c Average No. / Trip (Density/100 Acres)

Table 12. Percentage difference between winter bird populations at Burgner Acres, Coles County, Illinois, and Trelease Woods, Champaign, County, Illinois.

Species	Difference Between Average Densities per 100 Acres
Ring-necked Pheasant	9
Mourning Dove	60
Great Horned Owl	2
Yellow-shafted Flicker	4
Red-bellied Woodpecker	5
Red-headed Woodpecker	27
Hairy Woodpecker	4
Downy Woodpecker	8
Blue Jay	7
Common Crow	30
Carolina Chickadee	2
Tufted Titmouse	1
White-breasted Nuthatch	4
Brown Creeper	1
Robin	5
Starling	62
House Sparrow	23
Eastern Meadowlark	5
Cardinal	6
American Goldfinch	6
Slate-colored Junco	2
Tree Sparrow	10
Song Sparrow	15

Total differences - 298 birds

$$\text{Percentage difference} = \frac{298}{578} \times 100 = 52\% \text{ difference}$$

SPRING CENSUS 1968: Sixteen trips (Table 13) were taken to Burgner Acres during the spring census period with a total observation time of 47 hours. Two days were overcast while fourteen days were clear and sunny (Table 1).

The covey of eight Bobwhites seen on October 18, 1967, (Table 2), was decreased to two by June 13, 1968, (Table 13). This could have been due to predation, dispersion, or death due to winter weather. Errington (1934) suggested that a quail population will suffer light losses in a favorable environment and heavy losses in a weak environment and normal dispersion started in April. The feeling is that Burgner Acres was a favorable environment and that the decrease in the number of Bobwhites was probably due to normal dispersion.

The first birds migrating through Burgner Acres were seen as early as April 11, 1967. The Green Heron is an example (Table 13). May 9 and 10, 1968, were noted for their abundance in migrating birds such as the warblers, which were gone by June 13, 1968, (Table 13).

A total of eighty-three species were observed during the spring 1968 bird census (Table 14). Seventeen species were permanent residents, thirty spring and fall migrants, twenty-two were summer residents, four winter residents, and four spring migrants (Table 14). A total of thirty-nine species probably nested at Burgner Acres as contrasted to twenty-eight during the 1965 spring census. Even though the 1967-68 spring census had a greater number of species observed (83) as compared to the seventy-one species of the 1965 census, there were

still species seen during both which were not sighted in the other period.

The total average D. / 100 was three hundred and twenty birds for the spring 1968 census (Table 15) while six species were listed as abundant, eight common, eighteen moderately common, twenty-eight uncommon, and twenty-three rare (Table 16). The Redwinged Blackbird had the highest D. / 100 with forty-five followed by the Mourning Dove (30), Blue Jay (20), Eastern Meadowlark (20), Common Grackle (20), and Song Sparrow (20) (Table 15). The Mourning Dove, Blue Jay, Brown Thrasher, and Song Sparrow had a relative abundance of one hundred percent, while the Redwinged Blackbird and Eastern Meadowlark had a relative abundance of ninety-four percent (Table 16).

The ideal method for determining the bird population of any area would be continuous daily trips to the site for an indefinite period of time. This would result in more exact results which would pinpoint the arrival and departure dates to more precise days. It would also give a more accurate picture of the abundance of a species for both density per one hundred acres and frequency of occurrence. The more days an observer is in the field the less chance he would have of missing a rare species; thus, a better and a more accurate bird account.

Table 13. Spring 1968 census of birds at Burgner Acres, Coles County, Illinois, based on the date first seen and the number observed on each date.

Species	Month	March					April					May				June	Total	
	Day	26	9	11	16	18	23	25	28	30	1	4	9	10	14	16		13
Red-tailed Hawk		1									1				1			3
Ring-necked Pheasant		1	2	2	1	1	1		1	1		1	3	1	1	1	1	18
Mourning Dove		3	8	6	7	8	7	6	9	9	5	7	5	1	3	6	5	95
Yellow-shafted Flicker		1	3	4	3	1	1	2	1				4	1	4		2	27
Red-bellied Woodpecker		3	1		3		1		2		3			1	2	1	2	19
Blue Jay		4	2	5	4	1	4	4	5	7	5	4	2	4	5	3	5	64
Common Crow		1						2						2	2	2	2	11
Brown Thrasher		1	2	2	4	4	3	5	4	4	1	8	5	1	3	2	1	50
Eastern Bluebird		1		1				1				1	1		1			6
Starling		5	4		2		4	1	1	3	2	3	1	1	3	1	1	32
Eastern Meadowlark		6	7	4		2	1	4	3	8	5	6	7	3	5	4	3	68
Cardinal		3	1	1	6			4	1	2	4		2	4	2		1	31
Slate-colored Junco		6																6
Song Sparrow		3	11	4	2	3	3	1	2	4	3	3	4	9	4	3	1	60
Bobwhite			3	3		3	4	3	1	4	1	2	1	1	1	2	2	31
Rock Dove			1															1
Owl sp.			1															1
Yellow-bellied Sapsucker			2		2													4
Downy Woodpecker			1		2	1	1	1			1			1	1			9
Eastern Phoebe			1															1
Tufted Titmouse			2		2					1		2					1	8
Black-capped Chickadee			1															1
Robin			4	2	3	2	1	2	1	4	3	3	3	1	3	2		34
Ruby-crowned Kinglet			2										1					3

Table 13. (Continued)

Species	Month	March					April					May				June		Total
	Day	26	9	11	16	18	23	25	28	30	1	4	9	10	14	16	13	
House Sparrow			1		1								1	1				4
Redwinged Blackbird		15	20	5	10	6	15	12	10		5	5	11	5	8	3	8	138
Common Grackle		15	3			4	1	1			1		1	1	15	1	20	63
Brown-headed Cowbird		5	1	2		4			1		1	1	1					16
Blue-gray Gnatcatcher			2		2													4
Green Heron					1							1	1					3
House Wren					1				1				1	1			2	6
Hermit Thrush					1													1
American Goldfinch					6				1	5	1	1	6	1	4	2		27
Tree Sparrow					1			2										3
Field Sparrow						1		2		1			8	1	2	2	1	19
Lincoln's Sparrow					2													2
Red-headed Woodpecker							2	2	2	3	4	5	4	3	4	1		30
Tree Swallow							2							2				4
Barn Swallow							3						1		2			6
Mockingbird							1					1						2
Myrtle Warbler								3		2	6	3	5		2			21
Northern Waterthrush						1			1				3	1	1	1		8
Baltimore Oriole						1							4	1	2	1		9
Chimney Swift									3		1		1			5		10
Catbird									1	1			5	3	1	2		13
Rufous-sided Towhee									1		1		1					3
White-throated Sparrow									1	1	1		7			2		12
Great Horned Owl										1	2				1		1	5

Table 13. (Continued)

Species	Month	March					April					May				June	Total	
	Day	26	9	11	16	18	23	25	28	30	1	4	9	10	14	16		13
Palm Warbler									2		4	2	4		1			13
Swamp Sparrow									1		1			1				3
Orchard Oriole											2	2	2	1	2			9
Indigo Bunting											2	2	3	5			2	14
Eastern Kingbird												1	3	2	2			8
Great Crested Flycatcher												1	1	2	1	1		6
Yellowthroat												1	2	3	2	2		10
Rose-breasted Grosbeak												1	2		1		1	5
Belted Kingfisher													1					1
Flycatcher sp.													3			3		6
Wood Thrush													1	1				2
Swainson's Thrush													5	2	1	1		9
Black-and-white Warbler													3					3
Nashville Warbler													4	1				5
Magnolia Warbler													2	3				5
Black-throated Green Warbler													1	1				2
Bay-breasted Warbler													1		1			2
Kentucky Warbler													1					1
American Redstart													1	1	1			3
White-crowned Sparrow													1	2				3
Common Nighthawk														1				1
Ruby-throated Hummingbird														1				1
Gray-cheeked Thrush														1				1
White-eyed Vireo														1				1
Blackburnian Warbler														1	1			2

Table 13. (Continued)

Species	Month	March		April						May				June		Total		
	Day	26	9	11	16	18	23	25	28	30	1	4	9	10	14		16	13
Chestnut-sided Warbler													1	1				2
Scarlet Tanager													1					1
Warbler sp.														2				2
Sparrow sp.														1				1
Veery																1		1
Ovenbird																1		1
Connecticut Warbler															2			2
Yellow-billed Cuckoo																	3	3
Traill's Flycatcher																	1	1
Eastern Wood Pewee																	1	1
Total Species		14	24	15	22	13	23	17	21	23	27	25	52	42	40	28	23	
Total Individuals		39	95	60	61	39	59	57	54	76	67	67	144	80	100	58	67	1123

Table 14. Birds observed spring, March 26, to June 13, 1968, at Burgner Acres, Coles County, Illinois, in phylogenetic order with resident status.*

1. Green Heron, M
2. Red-tailed Hawk, M, WR
3. Bobwhite, PR
4. Ring-necked Pheasant, PR
5. Rock Dove, PR
6. Mourning Dove, PR
7. Yellow-billed Cuckoo, PR
8. Great Horned Owl, PR
9. Owl sp.
10. Common Nighthawk, SP
11. Chimney Swift, SR
12. Ruby-throated Hummingbird, M
13. Belted Kingfisher, M
14. Yellow-shafted Flicker, SR
15. Red-bellied Woodpecker, PR
16. Red-headed Woodpecker, SR
17. Yellow-bellied Sapsucker, M
18. Downy Woodpecker, PR
19. Eastern Kingbird, SR
20. Great Crested Flycatcher, SR
21. Eastern Phoebe, M
22. Traill's Flycatcher, M
23. Eastern Wood Pewee, SR
24. Flycatcher sp.
25. Tree Swallow, M
26. Barn Swallow, SR
27. Blue Jay, PR
28. Common Crow, PR
29. Black-capped Chickadee, WR
30. Tufted Titmouse, PR
31. House Wren, SR
32. Mockingbird, M, WR
33. Catbird, SR
34. Brown Thrasher, SR
35. Robin, PR
36. Wood Thrush, SR
37. Hermit Thrush, M
38. Swainson's Thrush, M
39. Gray-cheeked Thrush, M
40. Veery, M
41. Eastern Bluebird, SR
42. Blue-gray Gnatcatcher, SPM
43. Ruby-crowned Kinglet, M

Table 14. (Continued)

44. Starling, PR
45. White-eyed Vireo, SPM
46. Black-and-white Warbler, M
47. Nashville Warbler, M
48. Magnolia Warbler, M
49. Myrtle Warbler, M
50. Black-throated Green Warbler, M
51. Blackburnian Warbler, M
52. Chestnut-sided Warbler, M
53. Bay-breasted Warbler, M
54. Palm Warbler, SPM
55. Ovenbird, M
56. Northern Waterthrush, M
57. Kentucky Warbler, M
58. Connecticut Warbler, M
59. Yellowthroat, SR
60. American Redstart, M
61. Warbler sp.
62. House Sparrow, PR
63. Eastern Meadowlark, SR
64. Redwinged Blackbird, SR
65. Orchard Oriole, SR
66. Baltimore Oriole, SR
67. Common Grackle, SR
68. Brown-headed Cowbird, SR
69. Scarlet Tanager, M
70. Cardinal, PR
71. Rose-breasted Grosbeak, SR
72. Indigo Bunting, SR
73. American Goldfinch, PR
74. Rufous-sided Towhee, SR
75. Slate-colored Junco, WR
76. Tree Sparrow, WR
77. Field Sparrow, SR
78. White-crowned Sparrow, M
79. White-throated Sparrow, M
80. Lincoln's Sparrow, M
81. Swamp Sparrow, M
82. Song Sparrow, PR
83. Sparrow sp.

*PR = Permanent Resident
 SR = Summer Resident
 WR = Winter Resident

M = Spring and Fall Migrant
 SPM = Spring Migrant
 FM = Fall Migrant

Table 15. Density of spring species, March 26 to June 13, 1968, in decreasing abundance, for Burgner Acres, Coles County, Illinois.

Species	Ave. No. Birds per Trip	Density per 100 Acres
Redwinged Blackbird	9	45
Mourning Dove	6	30
Blue Jay	4	20
Eastern Meadowlark	4	20
Common Grackle	4	20
Song Sparrow	4	20
Brown Thrasher	3	15
Bobwhite	2	10
Yellow-shafted Flicker	2	10
Red-headed Woodpecker	2	10
Robin	2	10
Starling	2	10
Cardinal	2	10
American Goldfinch	2	10
Ring-necked Pheasant	1	5
Chimney Swift	1	5
Red-bellied Woodpecker	1	5
Downy Woodpecker	1	5
Common Crow	1	5

Table 15. (Continued)

Species	Ave. No. Birds per Trip	Density per 100 Acres
Catbird	1	5
Swainson's Thrush	1	5
Myrtle Warbler	1	5
Palm Warbler	1	5
Yellowthroat	1	5
Orchard Oriole	1	5
Baltimore Oriole	1	5
Brown-headed Cowbird	1	5
Indigo Bunting	1	5
Field Sparrow	1	5
White-throated Sparrow	1	5
Green Heron	+ ^a	
Red-tailed Hawk	+	
Rock Dove	+	
Yellow-billed Cuckoo	+	
Great-horned Owl	+	
Owl sp.	+	
Common Nighthawk	+	
Ruby-throated Hummingbird	+	
Belted Kingfisher	+	
Yellow-bellied Sapsucker	+	

Table 15. (Continued)

Species	Ave. No. Birds per Trip	Density per 100 Acres
Eastern Kingbird	+	
Great Crested Flycatcher	+	
Eastern Phoebe	+	
Traill's Flycatcher	+	
Eastern Wood Pewee	+	
Flycatcher sp.	+	
Tree Swallow	+	
Barn Swallow	+	
Black-capped Chickadee	+	
Tufted Titmouse	+	
House Wren	+	
Mockingbird	+	
Wood Thrush	+	
Hermit Thrush	+	
Gray-cheeked Thrush	+	
Veery	+	
Eastern Bluebird	+	
Blue-gray Gnatcatcher	+	
Ruby-crowned Kinglet	+	
White-eyed Vireo	+	
Black-and-white Warbler	+	

Table 15 (Continued)

Species	Ave. No. Birds per Trip	Density per 100 Acres
Nashville Warbler	+	
Magnolia Warbler	+	
Black-throated Green Warbler	+	
Blackburnian Warbler	+	
Chestnut-sided Warbler	+	
Bay-breasted Warbler	+	
Ovenbird	+	
Northern Waterthrush	+	
Kentucky Warbler	+	
Connecticut Warbler	+	
American Redstart	+	
Warbler sp.	+	
House Sparrow	+	
Scarlet Tanager	+	
Rose-breasted Grosbeak	+	
Rufous-sided Towhee	+	
Slate-colored Junco	+	
Tree Sparrow	+	
White-crowned Sparrow	+	
Lincoln's Sparrow	+	

Table 15. (Continued)

Species	Ave. No. Birds per Trip	Density per 100 Acres
Swamp Sparrow	+	
Sparrow sp.	+	
Total Average per trip - 64 birds		
Total Average density per 100 acres - 320 birds		

^a 0.5 or less

Table 16. Relative abundance in terms of frequency of occurrence of birds observed at Burgner Acres, Coles County, Illinois, spring (March 26, to June 13, 1968).

Species	No. Times Observed ^a	Relative Abundance ^b
Mourning Dove	16	100% (A)
Blue Jay	16	100% (A)
Brown Thrasher	16	100% (A)
Song Sparrow	16	100% (A)
Redwinged Blackbird	15	94% (A)
Eastern Meadowlark	15	94% (A)
Bobwhite	14	87% (C)
Ring-necked Pheasant	14	87% (C)
Robin	14	87% (C)
Starling	14	87% (C)
Yellow-shafted Flicker	12	75% (C)
Cardinal	12	75% (C)
Red-headed Woodpecker	11	69% (C)
Common Grackle	11	69% (C)
Field Sparrow	10	62% (MC)
Red-bellied Woodpecker	9	56% (MC)
American Goldfinch	9	56% (MC)
Downy Woodpecker	8	50% (MC)
Brown-headed Cowbird	8	50% (MC)
Common Crow	7	43% (MC)

Table 16. (Continued)

Species	No. Times Observed ^a	Relative Abundance ^b
Catbird	6	37% (MC)
Eastern Bluebird	6	37% (MC)
Myrtle Warbler	6	37% (MC)
Northern Waterthrush	6	37% (MC)
Great Crested Flycatcher	5	31% (MC)
House Wren	5	31% (MC)
Palm Warbler	5	31% (MC)
Yellowthroat	5	31% (MC)
Orchard Oriole	5	31% (MC)
Baltimore Oriole	5	31% (MC)
Indigo Bunting	5	31% (MC)
White-throated Sparrow	5	31% (MC)
Great Horned Owl	4	25% (UC)
Chimney Swift	4	25% (UC)
Eastern Kingbird	4	25% (UC)
Tufted Titmouse	4	25% (UC)
Swainson's Thrush	4	25% (UC)
House Sparrow	4	25% (UC)
Rose-breasted Grosbeak	4	25% (UC)
Green Heron	3	18% (UC)

Table 16. (Continued)

Species	No. Times Observed ^a	Relative Abundance ^b
Red-tail Hawk	3	18% (UC)
Barn Swallow	3	18% (UC)
American Redstart	3	18% (UC)
Rufous-sided Towhee	3	18% (UC)
Swamp Sparrow	3	18% (UC)
Yellow-bellied Sapsucker	2	12% (UC)
Flycatcher sp.	2	12% (UC)
Tree Swallow	2	12% (UC)
Mockingbird	2	12% (UC)
Wood Thrush	2	12% (UC)
Blue-gray Gnatcatcher	2	12% (UC)
Ruby-crowned Kinglet	2	12% (UC)
Nashville Warbler	2	12% (UC)
Magnolia Warbler	2	12% (UC)
Black-throated Green Warbler	2	12% (UC)
Blackburnian Warbler	2	12% (UC)
Chestnut-sided Warbler	2	12% (UC)
Bay-breasted Warbler	2	12% (UC)
Tree Sparrow	2	12% (UC)
White-crowned Sparrow	2	12% (UC)

Table 16. (Continued)

Species	No. Times Observed ^a	Relative Abundance ^b
Owl sp.	1	6% (R)
Rock Dove	1	6% (R)
Yellow-billed Cuckoo	1	6% (R)
Common Nighthawk	1	6% (R)
Ruby-throated Hummingbird	1	6% (R)
Belted Kingfisher	1	6% (R)
Eastern Phoebe	1	6% (R)
Traill's Flycatcher	1	6% (R)
Eastern Wood Pewee	1	6% (R)
Black-capped Chickadee	1	6% (R)
Hermit Thrush	1	6% (R)
Gray-cheeked Thrush	1	6% (R)
Veery	1	6% (R)
White-eyed Vireo	1	6% (R)
Black-and-white Warbler	1	6% (R)
Ovenbird	1	6% (R)
Kentucky Warbler	1	6% (R)
Connecticut Warbler	1	6% (R)
Warbler sp.	1	6% (R)
Scarlet Tanager	1	6% (R)

Table 16. (Continued)

Species	No. Times Observed ^a	Relative Abundance ^b
Slate-colored Junco	1	6% (R)
Lincoln's Sparrow	1	6% (R)
Sparrow sp.	1	6% (R)

^bTotal observation period was 16 trips

^a(A) = Abundant
 (C) = Common
 (MC) = Moderately Common
 (UC) = Uncommon
 (R) = Rare

SUMMARY

1. A fall, winter, and spring bird population study was carried out at Burgner Acres, an upland stream-side, ash-elm forest and forest-edge of twenty acres from September 26, 1967 to June 13, 1968. Burgner Acres is located in Coles County, Illinois, (NE1/4, Sec. 1, T12N, R8E) and is a wildlife sanctuary.
2. Density measured as birds per one hundred acres was determined by dividing the average number of birds per trip by the total acres of the study area. The average number per trip and density per one hundred acres for each species observed during the fall 1967 census was: Canada Goose, 13 (65); Mourning Dove, 8 (30); Robin, 5 (25); White-throated Sparrow, 5 (25); Blue Jay, 4 (20); Myrtle Warbler, 3 (15); House Sparrow, 3 (15); Slate-colored Junco, 3 (15); Yellow-shafted Flicker, 2 (10); Ruby-crowned Kinglet, 2 (10); Redwinged Blackbird, 2 (10); Red-tailed Hawk, 1 (5); Bobwhite, 1 (5); Red-bellied Woodpecker, 1 (5); Downy Woodpecker, 1 (5); Black-capped Chickadee, 1 (5); Tufted Titmouse, 1 (5); Hermit Thrush, 1 (5); Cardinal, 1 (5); Song Sparrow, 1 (5); Marsh Hawk, +; Rock Dove, +; Yellow-billed Cuckoo, +; Owl sp., +; Chimney Swift, +; Red-headed

Woodpecker, +; Yellow-bellied Sapsucker, +; Hairy Woodpecker, +; Eastern Phoebe, +; Eastern Wood Phoebe, +; Flycatcher sp., +; Common Crow, +; Brown Creeper, +; House Wren, +; Winter Wren, +; Wood Thrush, +; Eastern Bluebird, +; Golden-crowned Kinglet, +; Black-and-white Warbler, +; Black-throated Green Warbler, +; Pine Warbler, +; Prairie Warbler, +; Eastern Meadowlark, +; Common Grackle, +; Scarlet Tanager, +; American Goldfinch, +; Fox Sparrow, +. This gives a total of forty-seven species; a total average per trip of fifty-nine, and a total average density per one hundred acres of two hundred and ninety-five.

The average number per trip and density per one hundred acres for each species seen during the winter 1967-68 census was: Mourning Dove, 23 (115); Slate-colored Junco, 6 (30); Starling, 5 (25); Blue Jay, 4 (20); Song Sparrow, 4 (20); House Sparrow, 3 (15); Red-bellied Woodpecker, 2 (10); Common Crow, 2 (10); Cardinal, 2 (10); American Goldfinch, 2 (10), Tree Sparrow, 2 (10); Bobwhite, 1 (5); Yellow-shafted Flicker, 1 (5); Downy Woodpecker, 1 (5); Tufted Titmouse, 1 (5); Robin, 1 (5); Eastern Meadowlark, 1 (5); Red-tailed Hawk, +; Sparrow Hawk, +; Ring-necked Pheasant, +; Rock Dove, +; Barn Owl, +; Owl sp., +; Hairy Woodpecker, +; Horned Lark, +; Black-capped Chickadee, +; Carolina Chickadee, +; Brown Creeper, +; Mockingbird, +; Eastern Bluebird, +; Redwinged Blackbird, +;

Common Grackle, +; Fox Sparrow, +. This gives a total of thirty-three species; a total average per trip of sixty-one, and a total average density per one hundred acres of three hundred and five.

The average number per trip and density per one hundred acres sighted during the spring 1968 census was: Redwinged Blackbird, 9 (45); Mourning Dove, 6 (30); Blue Jay, 4 (20); Eastern Meadowlark, 4 (20); Common Grackle, 4 (20); Song Sparrow, 4 (20); Brown Thrasher, 3 (15); Bobwhite, 2 (10); Yellow-shafted Flicker, 2 (10); Red-headed Woodpecker, 2 (10); Robin, 2 (10); Starling, 2 (10); Cardinal, 2 (10); American Goldfinch, 2 (10) Ring-necked Pheasant, 1 (5); Chimney Swift, 1 (5); Red-bellied Woodpecker, 1 (5) Downy Woodpecker, 1 (5); Common Crow, 1 (5); Catbird, 1 (5); Swainson's Thrush, 1 (5); Myrtle Warbler, 1 (5); Palm Warbler, 1 (5); Yellowthroat, 1 (5); Orchard Oriole, 1 (5); Baltimore Oriole, 1 (5) Brown-headed Cowbird, 1 (5); Indigo Bunting, 1 (5) Field Sparrow, 1 (5); White-throated Sparrow, 1 (5) Green Heron, +; Red-tailed Hawk, +; Rock Dove, +; Yellow-billed Cuckoo, +; Great-horned Owl, +; Owl sp., +; Common Nighthawk, +; Ruby-throated Hummingbird, +; Belted Kingfisher, +; Yellow-bellied Sapsucker, +; Eastern Kingbird, +; Great Crested Flycatcher, +; Eastern Phoebe, +; Traill's Flycatcher, +; Eastern Wood Pewee, +; Flycatcher sp., +; Tree Swallow, +; Barn Swallow, +;

Black-capped Chickadee, +; Tufted Titmouse, +; House Wren, +; Mockingbird, +; Wood Thrush, +; Hermit Thrush, +; Gray-cheeked Thrush, +; Veery, +; Eastern Bluebird, +; Blue-gray Gnatcatcher, +; Ruby-crowned Kinglet, +; White-eyed Vireo, +; Black-and-white Warbler, +; Nashville Warbler, +; Magnolia Warbler, +; Black-throated Green Warbler, +; Blackburnian Warbler, +; Chestnut-sided Warbler, +; Bay-breasted Warbler, +; Ovenbird, +; Northern Waterthrush, +; Kentucky Warbler, +; Connecticut Warbler, +; American Redstart, +; Warbler sp., +; House Sparrow, +; Scarlet Tanager, +; Rose-breasted Grosbeak, +; Rufous-sided Towhee, +; Slate-colored Junco, +; Tree Sparrow, +; White-crowned Sparrow, +; Lincoln's Sparrow, +; Swamp Sparrow, +; Sparrow sp., +. This gives a total of eighty-three species, a total average per trip of sixty-four, and a total average density per one hundred acres of three hundred and twenty.

3. Abundance of birds in terms of frequency of occurrence was found by dividing the number of times a species was spotted by the total number of observation periods. The most abundant species during the fall 1967 census was the Blue Jay. The most abundant species during the winter 1967-68 census were the Red-bellied Woodpecker, Song Sparrow, Mourning Dove, Blue Jay, and Slate-colored Junco. The Mourning Dove, Blue Jay, Brown Thrasher, Song Sparrow, Redwinged Blackbird, and Eastern Meadowlark were the most abundant species during the spring 1968 census.

4. Comparisons were made between the winter bird populations at Burgner Acres for 1964-65, 1965-66, and 1967-68. The average percentage difference for the three census periods was fifty-one percent which indicates a close similarity in the populations.
5. Comparisons of the winter bird populations of Burgner Acres and Trelease Woods indicated a percentage difference of fifty-two percent. These data suggest a relatively close correlation between the two bird populations.

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APPENDIX A

Phylogenetic List of Birds Observed at Burgner Acres, Coles County, Illinois, from September 26, 1967 to June 13, 1968, and resident status.^a

1. Green Heron, Butorides virescens, M
2. Canada Goose, Branta canadensis, M
3. Red-tailed Hawk, Buteo jamaicensis, M, WR
4. Marsh Hawk, Circus cyaneus, SPM
5. Sparrow Hawk, Falco sparverius, PR
6. Bobwhite, Colinus virginianus, PR
7. Ring-necked Pheasant, Phasianus colchicus, PR
8. Rock Dove, Columba livia, PR
9. Mourning Dove, Zenaidura macroura, PR
10. Yellow-billed Cuckoo, Coccyzus americanus, SR
11. Barn Owl, Tyto alba, PR
12. Great Horned Owl, Bubo virginianus, PR
13. Owl sp.
14. Common Nighthaw, Chordeiles minor, SPM
15. Chimney Swift, Chaetura pelagica, SR
16. Ruby-throated Hummingbird, Archilochus colubris, M
17. Belted Kingfisher, Megaceryle alcyon, M
18. Yellow-shafted Flicker, Colaptes auratus, SR
19. Red-bellied Woodpecker, Centurus carolinus, PR
20. Red-headed Woodpecker, Melanerpes erythrocephalus, SR
21. Yellow-bellied Sapsucker, Sphyrapicus varius, M
22. Hairy Woodpecker, Dendrocopas villosus, PR

23. Downy Woodpecker, Dendrocopas pubescens, PR
24. Eastern Kingbird, Tyrannus tyrannus, SR
25. Great Crested Flycatcher, Myiarchus crinitus, SR
26. Eastern Phoebe, Sayornis phoebe, M
27. Traill's Flycatcher, Empidonax traillii, M
28. Eastern Wood Pewee, Contopus virens, SR
29. Flycatcher sp.
30. Horned Lark, Eremophila alpestris, PR
31. Tree Swallow, Iridoprocne bicolor, M
32. Barn Swallow, Hirunda rustica, SR
33. Blue Jay, Cyanocitta cristata, PR
34. Common Crow, Corvus brachyrhynchos, PR
35. Black-capped Chickadee, Parus atricapillus, WR
36. Carolina Chickadee, Parus carolinensis, PR
37. Tufted Titmouse, Parus bicolor, PR
38. Brown Creeper, Certhia familiaris, WR
39. House Wren, Troglodytes aedon, SR
40. Winter Wren, Troglodytes troglodytes, M
41. Mockingbird, Mimus polyglottos, M, WR
42. Catbird, Dumetella carolinensis, SR
43. Brown Thrasher, Toxostoma rufum, SR
44. Robin, Turdus migratorius, PR
45. Wood Thrush, Hylocichla mustelina, SR
46. Hermit Thrush, Hylocichla guttata, M

47. Swainson's Thrush, Hylocichla ustulata, M
48. Gray-cheeked Thrush, Hylocichla minima, M
49. Veery, Hylocichla fuscescens, M
50. Eastern Bluebird, Sialia sialis, SR
51. Blue-gray Gnatcatcher, Poliophtila caerulea, SPM
52. Golden-crowned Kinglet, Regulus satrapa, M
53. Ruby-crowned Kinglet, Regulus calendula, M
54. Starling, Sturnus vulgaris, PR
55. White-eyed Vireo, Vireo griseus, SPM
56. Black-and-white Warbler, Mniotilta varia, M
57. Nashville Warbler, Vermiuora ruficapilla, M
58. Magnolia Warbler, Dendroica magnolia, M
59. Myrtle Warbler, Dendroica coronata, M
60. Black-throated Green Warbler, Dendroica virens, M
61. Blackburnian Warbler, Dendroica fusca, M
62. Chestnut-sided Warbler, Dendroica pensylvanica, M
63. Bay-breasted Warbler, Dendroica castanea, M
64. Pine Warbler, Dendroica pinus, M
65. Prairie Warbler, Dendroica discolor, M
66. Palm Warbler, Dendroica palmarum, SPM
67. Ovenbird, Seiurus aurocapillus, M
68. Northern Waterthrush, Seiurus noveboracensis, M
69. Kentucky Warbler, Oporonis formosus, M
70. Connecticut Warbler, Oporonis agilis, M

71. Yellowthroat, Geothlypis trichas, SR
72. American Redstart, Setophaga ruticilla, M
73. Warbler sp.
74. House Sparrow, Passer domesticus, PR
75. Eastern Meadowlark, Sturnella magna, SR
76. Redwinged Blackbird, Agelaius phoeniceus, SR
77. Orchard Oriole, Icterus spurius, SR
78. Baltimore Oriole, Icterus galbula, SR
79. Common Grackle, Quiscalus quiscula, SR
80. Brown-headed Cowbird, Molothrus ater, SR
81. Scarlet Tanager, Piranga olivacea, M
82. Cardinal, Richmondia cardinalis, PR
83. Rose-breasted Grosbeak, Pheucticus ludovicianus, SR
84. Indigo Bunting, Passerina cyanea, SR
85. American Goldfinch, Spinus tristis, PR
86. Rufous-sided Towhee, Pipilo erythrophthalmus, SR
87. Slate-colored Junco, Junco yemalis, WR
88. Tree Sparrow, Spizella arborea, WR
89. Field Sparrow, Spizella pusilla, SR
90. White-crowned Sparrow, Zonotrichia leucophrys, M
91. White-throated Sparrow, Zonotrichia alibicollis, M
92. Fox Sparrow, Passerella iliaca, M
93. Lincoln's Sparrow, Melospiza lincolni, M

94. Swamp Sparrow, Melospiza georgiana, M
95. Song Sparrow, Melospiza melodia, PR
96. Sparrow sp.

^a
PR = Permant Resident
SR = Summer Resident
WR = Winter Resident
M = Spring and Fall Migrant
SPM = Spring Migrant
FM = Fall Migrant