

CAPITOL ROOM

MONDAY AFTERNOON

ROOM: Capitol

TIME: Monday 1:00 PM

TITLE: A Century of changing bird communities in Illinois

AUTHOR(S):

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ABSTRACT: From 1906-1909, Stephen Forbes, Alfred Gross and Howard Ray conducted the first quantitative bird survey in North America, documenting the numbers of all species of birds they observed in all habitat types across Illinois with a specific, repeatable method. Richard and Jean Graber repeated the study from 1956-1958, and we replicated their efforts from 2006-2008. Just as the state is dominated by a few land cover types, the bird community has become highly skewed towards a few generalist species: four birds (red-winged blackbirds, European starlings, American robins and common grackles) comprised more than one-half of all birds we recorded. Shrubland and grassland birds, which dominated the 1900s sample, have declined the most over the past 50 years. In contrast, forest bird communities have changed the least. Developed areas have the highest densities of birds, but the lowest diversity and the least variation among the northern, central and southern regions. Croplands generally support lower diversity than during the previous surveys. The combination of bird data, human dimensions surveys, and analysis of regional and local land use changes provides powerful insights for informing conservation decisions.

KEYWORDS: birds, Illinois, community

ROOM: Capitol

TIME: Monday 1:20 PM

TITLE: How Illinois landscapes have changed over the past fifty years and potential impacts on bird communities

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ABSTRACT: Habitat destruction and alteration is among the most important factors in bird population declines. These declines are generally assumed to be directly or indirectly associated with landscape level changes in the amount, configuration, or quality of habitats. We analyzed how Illinois landscapes have changed in conjunction with the 100-year bird survey. In 1906, Alfred Gross and Howard Ray began a three-year statewide effort to survey birds throughout Illinois. Because this study was conducted before the widespread use of airplanes, no aerial photographs were available for the earliest time period and we therefore concentrated on changes between the 1950s and 2000s. We digitized aerial photos for thirty 36-km² blocks (10 in the south, central, and north portions of Illinois) and used spatial tools to determine how the amount and configuration of habitats has changed. We lumped land cover into the following categories: barren, developed, cropland, forest, grassland, linear forest, linear grassland, orchard, shrubland, open water, and wetlands. Preliminary analyses suggest that the amount of cropland has not changed dramatically but the number of crop fields has. Across Illinois, fields are now on average twice the size they were in the 1950s, resulting in half the number of individual fields. In northern Illinois there has been a large increase in development at the expense of cropland. These and other regional changes in landscape composition and connectivity have significant conservation and management implications for Illinois birds.

KEYWORDS: landscape, birds, trends

ROOM: Capitol

TIME: Monday 1:40 PM

TITLE: Examining one-hundred-year changes in occupancy and relative abundance of Illinois birds

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ABSTRACT: The North American landscape and wildlife communities have changed substantially over the past century. In most cases, our understanding of these changes is based on comparisons of the limited anecdotal reports of early naturalists with recent quantitative data. In 1906, Alfred Gross and Howard Ray began a three-year statewide effort to survey birds throughout Illinois. Fortunately, the methods used during these surveys, the amount of survey effort, and approximate locations were documented. Using similar methods, Richard and Jean Graber surveyed birds throughout Illinois between 1956 and 1958, and we undertook comparable surveys from 2006 to 2008. The use of similar methods, recording of effort, and archiving of data allowed us an unprecedented opportunity to investigate avifaunal changes over a 100-year period. We used occupancy modeling to investigate changes in distribution and relative abundance of Illinois birds among the three time periods. Not surprisingly, some species have experienced pronounced declines in distribution or abundance, whereas others appear to have remained relatively stable or increased. Several species have increased occupancy and relative abundance since the late 1950s suggesting population-wide recovery. These data provide an unprecedented snapshot of how Illinois bird communities have changed and highlights both species and habitats in need of future conservation and management.

KEYWORDS: trends, Illinois, birds

ROOM: Capitol

TIME: Monday 2:00 PM

TITLE: Moving on up: which Illinois birds have dramatically changed their distribution over the last century and why

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ABSTRACT: The systematic nature by which Stephen Forbes designed the bird surveys conducted by A. Gross and H. Ray starting in 1906 allows us a unique view of the distribution of birds 100 years ago. These data suggest that while the distributions of many species have not shifted significantly, others have radically changed. Northern Cardinals, now ubiquitous across the state, in 1906 were primarily confined the southern portion of the state. While most species expanded their range north, others such as House Wrens have expanded their range south. Some species ranges, such as Dickcissels, have receded south. Preliminary analyses suggest that many of the birds expanding their range north are forest species, many of which use bird feeders in winter. Also, most of the species with expanding ranges are year-round residents. Several factors may be contributing to these shifts in species ranges including habitat alterations, global climate change, human activities such as bird feeding, and large-scale changes in species populations. As humans continue to rapidly change the environment, understanding which species distributions are shifting and why these ranges are changing will provide valuable information for their conservation and management.

KEYWORDS: range, birds, trends

ROOM: Capitol

TIME: Monday 2:20 PM

TITLE: A comparative study of bird populations in Illinois: human dimensions insights to further understanding outreach and management

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ABSTRACT: In 1906-09, 1956-08 and 2006-08 ornithologists at the Illinois Natural History Survey conducted a series of field surveys to assess changing bird populations in Illinois. Collectively these works indicate that the abundance and diversity of many species has changed over the past century. Whereas agriculture dominated the Illinois landscape over this time period, changes in agriculture have greatly affected bird communities. Efforts to conserve and restore avian populations will require successful management of agricultural lands, non-agricultural lands, and small parcels, yet little information about these landowners actions and perceptions of change in avian communities has been collected. In order to increase understanding of these issues across Illinois, we administered a mail-back questionnaire to 1597 individuals residing within 20 miles of bird survey field sites. Questionnaires were distributed in 2007 and we received a total of 547 useable responses. Responses indicate that observing birds is important to a majority of Illinois residents. However, respondents also felt that the quality and quantity of habitat for birds had decreased over the past 5 years. Fewer respondents noticed a corresponding decrease in the total number and number of bird species around their home. Respondents most commonly attributed the decline in bird populations to the availability and quality of nesting habitat. Most respondents wanted to see the amount and quality of bird habitat and bird species increase in the coming 5 years in the area where they live. These results are discussed in the context of changing bird communities and development of efforts to conserve habitats and communities in Illinois.

KEYWORDS: human, dimensions, birds

ROOM: Capitol

TIME: Monday 2:40 PM

TITLE: Land cover change and the breeding bird survey: A landscape analysis of rates of change in relation to roads

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ABSTRACT: Population estimates are important for managers and biologists to make informed decisions. One widely used methodology for sampling avian populations across North America is the Breeding Bird Survey (BBS) by the U.S. Fish and Wildlife Service. Reliability of the BBS data has been criticized due to surveys being conducted on road transects. The objective of this project was to assess land cover change in relation to roads on a landscape level over a thirty-year period and relate the results to the reliability of the BBS data. We used land cover at an ecoregion level to assess changes in land cover in proximity to roads. Ecoregions provide useful strata in this project because they relate to the environmental characteristics that derive factors that affect changes in land cover and wildlife populations. Our results showed little evidence that land cover change correlates with proximity to roads. Local land attributes can have cumulative effects on bird populations. We recommend that further research be conducted in respect to off-road point counts adjacent to BBS routes to detect discrepancies between estimates on and off-road because land cover at the landscape level does not reveal all components that affect population trends. We also recommend that further research be conducted to relate local land cover change to the landscape approach of this study. We also highlight priority areas of concern for future research in respect to the BBS.

KEYWORDS: BBS, ecoregion,

ROOM: Capitol

TIME: Monday 3:40 PM

TITLE: Defining a Markov model for analysis of an obligate grassland bird community

AUTHOR(S):

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ABSTRACT: Plant and animal communities have been described as co-occurring species assemblages. Due to their complexity, community-level studies have typically addressed patterns of species assemblages rather than their underlying processes. Research on species co-occurrence has focused mostly on inter-specific interactions such as competition and predator-prey interactions. Recent studies have examined the role of invasive exotic species and abiotic environmental factors. The preferred approach to this work has been to use of species by site presence/absence matrices. Our study differs from these earlier studies in that species co-occurrence is expressed using a species by species matrix. Species and species pair frequencies are given as a lower triangular matrix of dimension r where r is species richness. This approach facilitates the comparison of species pairs in relation to the frequencies of individual species. We define a state-transition or Markovian model to simulate probability transitions of species pairs through time. We use the model to analyze state changes in the occurrence of obligate grassland bird species that have been observed at Tallgrass Prairie National Preserve, Kansas, over six years. The approach should be useful for more extensive simulations of bird community dynamics in both woodland and grassland communities at other Midwestern National Parks.

KEYWORDS: community, Markov, bird

ROOM: Capitol

TIME: Monday 4:00 PM

TITLE: Estimating stopover duration in fall-migrating dabbling ducks using weather surveillance radar

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ABSTRACT: The number of migrant ducks that pass through a stopover site and the amount of time they spend there are difficult parameters to quantify, but are critical to the management of migrants and their habitat. We used weather surveillance radar from Lincoln, Illinois to identify and enumerate ducks emigrating from a major stopover area along the Illinois River over 8 years (1996-1998, 2003, and 2005-2008). Using weekly abundance estimates from Illinois Natural History Survey aerial inventories, we calculated the total number of use-days for each year. We then estimated mean stopover duration for each year (days per duck) by dividing aerial inventory estimates of total use-days by the total number of ducks seen departing on radar. The overall mean (10 days) differed greatly from the current value used in energetic carrying capacity models (28 days), and varied considerably among years (SD of 3 days). We found a clear, positive trend between our estimate of the average annual stopover duration and the quality of foraging habitat at our study site (R^2 of 0.58), suggesting that habitat, and its management have a direct effect on the amount of use a site receives. Indeed, as a result of this mechanism, we found that the quality of local foraging habitat had as great of an effect on the number of fall use-days (r of 0.43) as did the size of the breeding population (r of 0.43).

KEYWORDS: ducks, stopover, radar

ROOM: Capitol

TIME: Monday 4:20 PM

TITLE: Genetic distinction of northern bobwhite in Illinois at multiple spatial scales

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ABSTRACT: Choosing the appropriate scale at which to investigate genetic differentiation is a challenge in the emerging field of landscape genetics. We investigated the question of scale for the northern bobwhite (*Colinus virginianus*), which is thought to be the most sedentary of avian species. However, researchers have observed occasional long-distance movements. We expected bobwhite to exhibit pronounced genetic structure at the scale where their dispersal was limited and habitat was effectively isolated. We looked at fine- and coarse-scale genetic structure in Illinois bobwhite to determine their effective dispersal distance, delineate interbreeding groups, and define an appropriate scale to study landscape influences on gene flow. We collected tissue samples from wings submitted by hunters from Scott, Marion, Saline, and Washington Counties during 2007-2008. More than 200 samples were genotyped at 16 highly polymorphic microsatellite loci. Genetic structure at both scales was investigated using maximum likelihood techniques. We assessed dispersal distance by examining the decay of spatial autocorrelation at increasing distance classes. Although individuals were genetically structured at a fine scale (within the county), unique interbreeding groups were not detected at a coarse scale (between counties). Genetic structure at the coarse scale may have gone undetected due to a number of reasons including frequent long-distance dispersal, homoplasy of microsatellites, or the persistent introgression of pen-raised bobwhite genotypes. Evidence of frequent long-distance or stepping-stone dispersal indicates that bobwhites are not limited in their ability to disperse and colonize habitat once it becomes available.

KEYWORDS: bobwhite, genetics, landscape

ROOM: Capitol

TIME: Monday 4:40 PM

TITLE: Population ecology of northern bobwhites in Ohio: Living on the edge

AUTHOR(S):

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ABSTRACT: The Ohio population of northern bobwhites declined over 90% after severe winters in 1977-1978. Habitat loss and fragmentation are responsible for continued population decline. The goal of this study is to obtain baseline population data to evaluate long-term effects of regulated harvests in the fragmented landscape of Ohio. Seven study sites with different degrees of landscape connectivity were selected from the core bobwhite range in Ohio. We conducted spring whistle-count and fall covey-call surveys on 7 sites in 2008-2009. Mean numbers of singing males detected per whistle survey was 0-28 birds/site. 0 to 13 coveys were detected by covey-calls on 6 of 7 sites, compared to 1-9 coveys found by pointing dogs on 3 of 7 sites, although suitable habitat was present on all sites. This suggests that bobwhites are patchily distributed across the landscape in the species core range in Ohio. Eighty three birds were fitted with radio transmitters on 2 sites. Twenty nine of 47 (62%) radioed birds were lost to predation on one site where habitat was mostly thin stream corridors. Only 14 of 36 (39%) radioed birds were lost to predation on a second site where birds used edges of a large CRP field. Survival rates and covey sizes were highest on the latter site compared to the former. Birds mostly used linear habitats adjacent to CRP and small crop fields, pastures and woodlots during autumn/winter, and CRP and pastures for nesting. Coveys stayed within 150m of roosts during winter, using mostly linear edges, CRP and small crop fields. Eight of 14 nests (57%) were in CRP or pastures and 4 (29%) were found in linear edges. Future work will simulate harvest on sites containing different degrees of habitat fragmentation.

KEYWORDS: bobwhite, fragmentation, population