



# 50th Anniversary of the Illinois Spring Bird Count

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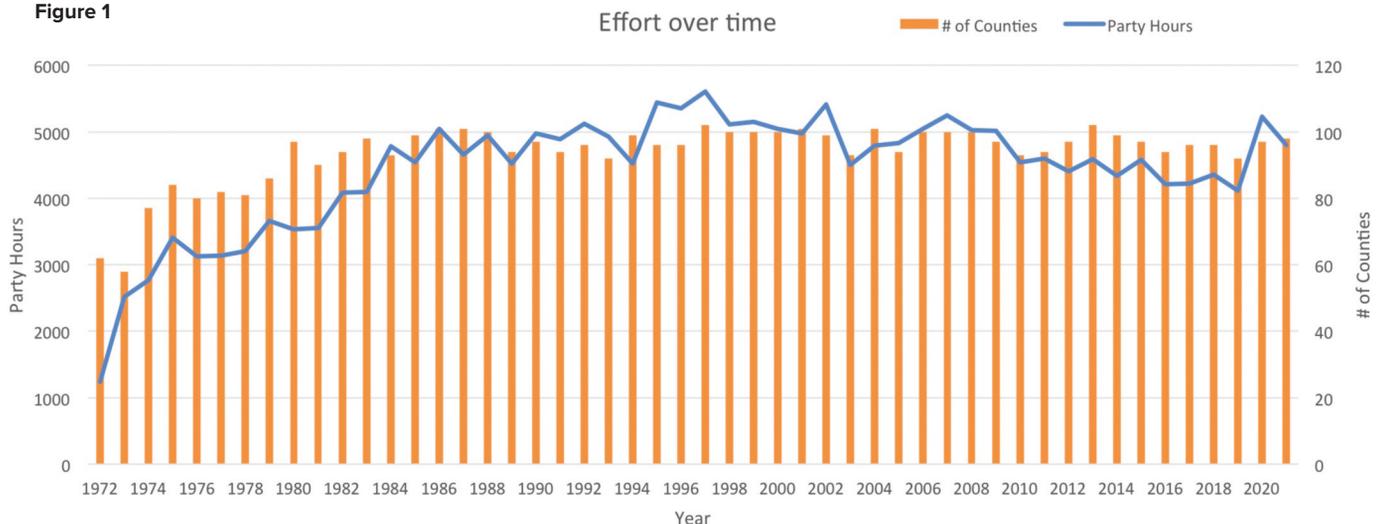
Upland sandpiper  
by Mike Ward

**IN 1972** the first ever statewide spring bird count (SBC) was initiated in Illinois. Coordinating the efforts at the time was Ornithologist Vernon (Vern) Kleen of the Illinois Department of Conservation (now known as the Illinois Department of Natural Resources). Kleen was interested in starting a survey program to monitor the birds not only breeding, but also migrating through Illinois. Because Kleen had experience with a similar program, started by Chandler Robbins a decade earlier in Maryland (at USGS Patuxent), he knew the benefits of such a survey. The methodology remains simple: count all the birds seen or heard within a county on the Saturday in May that falls

between the 4th and 10th. With the help of the Illinois Audubon Society, 650 observers were recruited at the time and 62 of Illinois' 102 counties were surveyed resulting in 1,241 party hours (the unit of effort used in the analysis).

As of 2021, the Illinois Spring Bird Count marked its 50th anniversary, and the amount of effort has certainly increased over the years (Figure 1). Over the first few years of the program, volunteers were recruited, and counties were added. The number of party hours has been between 4,000 and 5,000 for the last 40 years. In an average year, more than 1,000

Figure 1



participants are in the field surveying birds from Lake Shore Drive in Cook County to the Ohio River in Massac County.

Long-term monitoring programs are highly valued to track environmental change, but these datasets are few and far between. They require the foresight of researchers from decades ago and demand a level of yearly dedication and consistency. As the years go by, the value of the monitoring data increases. In our opinion, there are two general benefits of monitoring programs, specifically the SBC. First is that a large amount of data on the abundance and distribution of birds is collected over a broad area. While the SBC is not as systematic as other monitoring programs, such as the USGS North American Breeding Bird Survey (BBS), the SBC benefits from having more people in the field covering a greater variety of habitats. These data, especially when supported by research from other programs, can identify species of conservation concern. Further investigation can identify potential causes for decline and ultimately result in implementation of conservation strategies.

The other benefit, which could be argued as being just as valuable as the data, is engaging citizen scientists and exposing new people to the joy of being in the field. The SBC has been the vehicle by which many people in Illinois have learned about the diversity and abundance of avifauna in the state, often forging friendships along the way. As has been highlighted by many authors, humans do not value or conserve what they do not know about. The exposure of humans to the phenomenon of avian migration can foster an appreciation of birds and nature, potentially changing human behavior and promoting contributions to environmental conservation.

As we all know, our memories are faulty. Readers alive in 1972, likely remember the break-in at the Watergate complex leading to the scandal that brought down the presidency of Richard Nixon. But do readers remember that the average house cost in the USA was \$27,500 (today it is \$428,700), or that the Clean Water Act was passed and several legislative efforts to improve the environment were made that year? Do they remember seeing bald eagles? For the record, finding a bald eagle in May of 1972 in Illinois would have been a challenge. One bald eagle was detected on the SBC between 1972 and 1979 (in Randolph County in 1972). In 2021 bald eagles were found in 92 of the 98 counties where birds were surveyed. Do readers recall the status of Canada geese in 1972? The data from the SBC shows us that in the 1970s it would take on average 4 hours in the field to find one Canada goose. This is no longer the case. A Canada goose was detected every 15 minutes in 2021. The unfortunate point is that we human beings typically do not notice changes in wildlife populations until it is too late. While the mechanisms for why wildlife populations are changing is often beyond the scope of monitoring programs, clear associations and potential environmental causes for both the increasing and decreasing of species populations can be envisioned.

## Factors Impacting Trends

In most cases the factor that most impacts a species' population trend is habitat availability. This availability can come in the form of new habitat, for example the large amounts of grassland habitat being created as a result of landowner participation in the Conservation Reserve Program (CRP). Impacts can also be due to the habitat either declining in quality (e.g., invasion of exotic species) or increasing in quality (e.g., reduction of pollutants in a lake). The Clean Water Act, passed to regulate the discharge of pollutants into the waters of United States, proved highly beneficial to many habitats in Illinois, specifically its rivers (Mississippi, Illinois, etc.). In the 1970s and 80s some areas north of Peoria in the Illinois River were 'dead zones.' In the 1990s, much of the fish sampled in the Illinois River near Peoria were exotic common carp and goldfish competing with native species. As a result, in the early years of the SBC, many birds that forage on fish in rivers, lakes and streams were uncommon. Over the 50 years of the survey, we have seen species such as bald eagle, osprey, double-crested cormorant, American white pelican, Canada goose, hooded merganser and Caspian tern exhibit large population increases. While there are likely species-specific reasons for each population increase, it seems likely that the cleaning up of our rivers, lakes and streams contributed to rebounds.

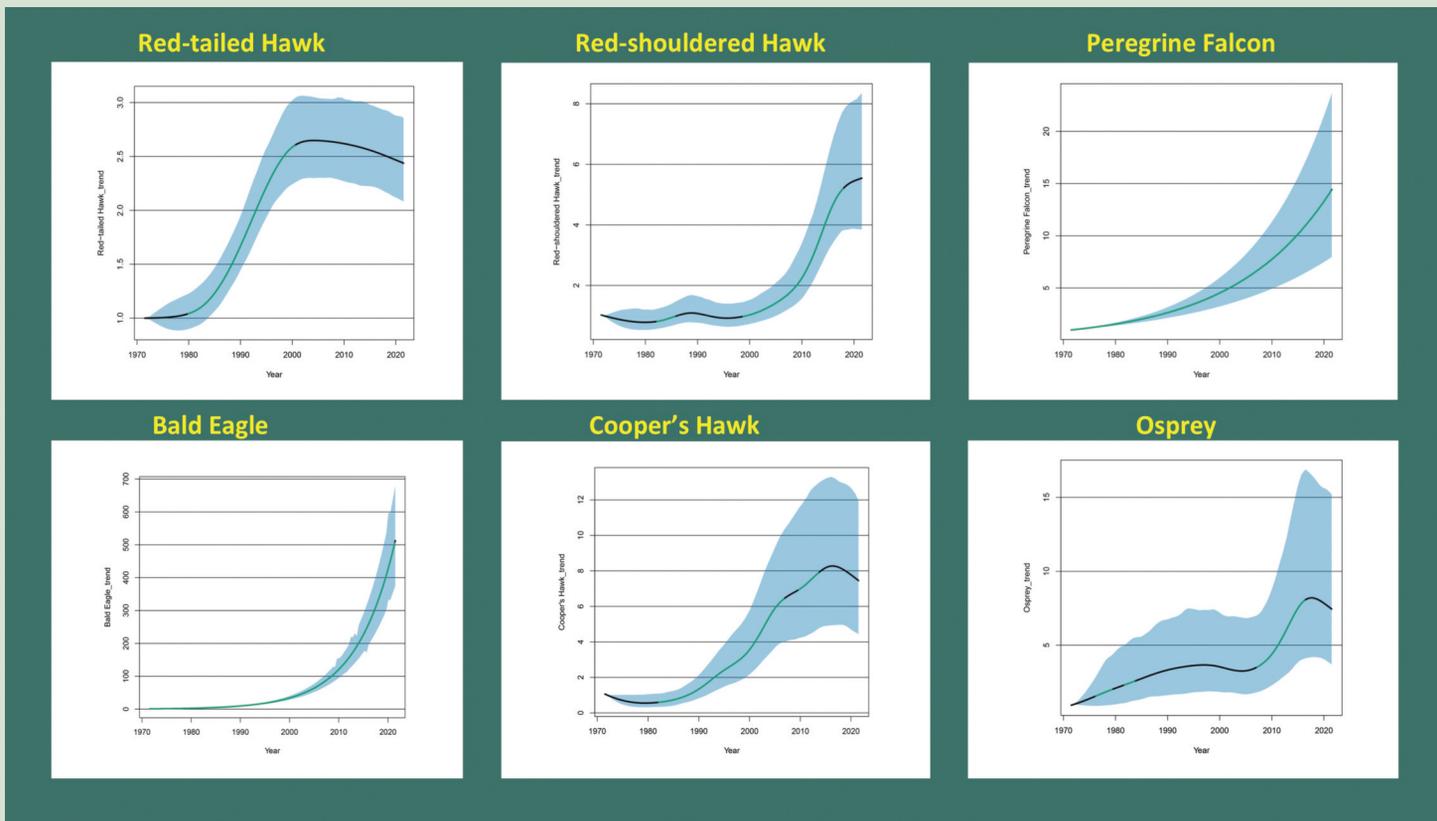
Changes in human behavior may have played a role. Historically, raptors were often shot (e.g. farmers attempting to reduce predation on poultry), but today shooting raptors is an uncommon and (in most cases) an illegal practice. The Migratory Bird Treaty Act of 1918 was amended in 1972 to include all birds of prey, further protecting raptors.

In 1972 there was great concern about the environment galvanized by awareness of major disasters (i.e., Cuyahoga River fire of 1969) and of degradations across the landscape. Today we continue to face major environmental challenges (i.e., pesticides, climate change, habitat loss) to which the bird populations are responding. One take-home from the 50-years of the SBC is that we can become aware of such challenges and attempt to realize substantial environmental benefits, if there is a will to do so.

## Acknowledgements and the Future

Fifty years is a long time and maintaining a program for that time requires considerable effort, not only from volunteers and compilers, but also the multiple public entities that continuously provide support in terms of volunteer recruitment and dissemination of findings. There are still volunteers participating in the SBC that were there for the first SBC. And unfortunately, there have been long-time volunteers (many of them bird conservationists) who have since passed. To all those that have volunteered and continue to volunteer, thank you. You are what keep this program afloat. We would like to say a special thanks to Vern Kleen, who initiated the SBC and coordinated it for nearly 35 years before beginning its transition to the Illinois Natural History Survey. Kleen is still

Figure 2



In 1972, in addition to the Clean Water Act being passed, the pesticide DDT (dichlorodiphenyltrichloroethane) was banned in the United States. DDT was known to bioaccumulate in raptors leading to reduced reproduction either through infertility or eggshells so thin that they broke during incubation. Banning DDT helped reverse the declines of bald eagles, ospreys, barn owls, peregrine falcons and other raptors. Figure 2 highlights the increase in population of many raptors since the ban.

actively volunteering and compiling for Union County every year, in addition to the many other bird monitoring programs he organizes and participates in. We thank the Illinois Audubon Society (IAS) for continuing to aid and support the SBC even after 50 years. IAS chapters reach throughout the state and have made it possible to have volunteers throughout the state. We would also like to thank the Illinois Ornithological Society not only for aiding in gathering volunteers (Cook County alone has around 200 volunteers every year), but also for publishing SBC reports so that others may appreciate the efforts of the program and that their efforts make a difference. The Illinois Department of Natural Resources, which encouraged the start of this program and allowed Kleen to get it off the ground, continues to be supportive. To all the other entities that have assisted, we thank you. As the birding community grows, we suspect we will see increased volunteer participation and look forward to continuing to nurture a love of birds and of conservation of natural habitats and the living organisms that depend on them.

We hope to make the database more user friendly so that all who would like to use the data or look at the findings are able to do so. Finally, we appreciate the many SBC stories that we have heard throughout the years with subjects like high species count days, crazy pop-up weather events, flood events, vehicles getting stuck or running out of gas, birders getting lost, and the stories of finding rare or vagrant birds.



# Species Trends

According to data gathered through 50 years of the Spring Bird Count (SBC), 35 bird species have experienced a population decline of more than 50 percent in Illinois over the last 50 years (Table 1). Yet, certain bird species are experiencing increase in populations, others have stable populations.

## Grassland Birds

The most glaring trend is the decline of grassland birds. The species with the greatest population decline (98.8 percent) is the state-endangered greater prairie-chicken, whose population is restricted to two counties. Some other grassland species that are experiencing large population declines are loggerhead shrike, upland sandpiper, northern bobwhite, horned lark, ring-necked pheasant, eastern meadowlark and bobolink (Figure 3). Across these species there are differences in the type of grasslands the species prefer (tallgrass, shortgrass, wet, mesic, dry, etc.), and likely differences in the mechanisms (poor reproduction, poor survival) contributing to the species decline. Given the large declines in these grassland birds, conservation efforts should focus on the creation/restoration of grasslands.

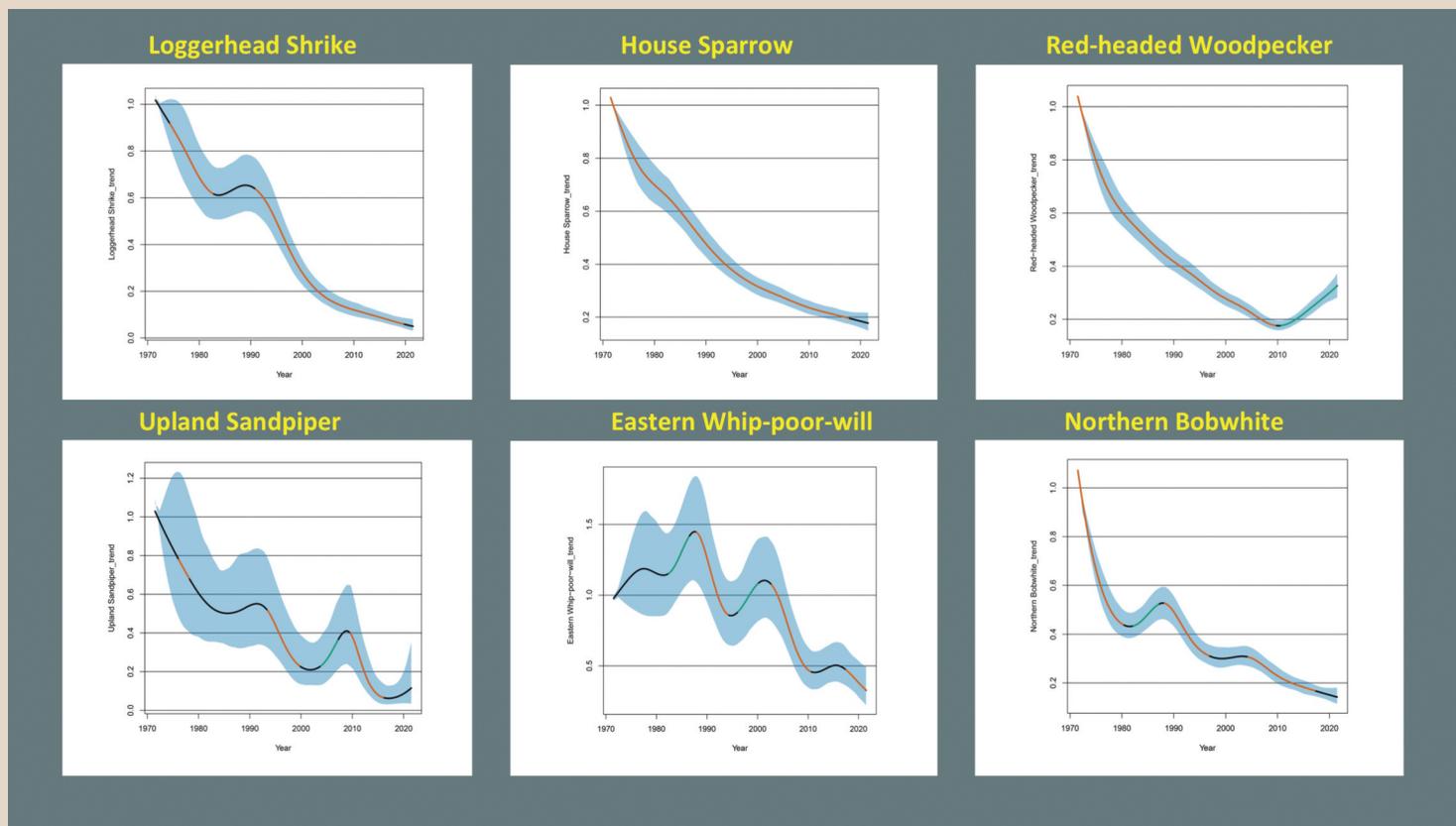
One of the species exhibiting 1,000+ percent population increase is the Henslow's sparrow. The increase in Henslow's sparrow is likely due to the increase in Conservation Reserve Program (CRP) grasslands over the last 50 years. The CRP grasslands created were typically dominated by dense, tall grass species creating the habitat preferred by Henslow's sparrows, but not other grassland species. CRP grasslands are the product of agricultural policy stemming from the farm bill. Unfortunately, political will to prioritize programs such as CRP is waning. Nevertheless, the recovery of Henslow's sparrow is another example of the fact that we can reverse population trends given the correct policies and programs.

## Wetland Birds

Wetland birds encompass a unique suite of species, with species being at the opposite ends of the population trend spectrum. As mentioned, the Clean Water Act likely helped in the recovery of some wetland birds, yet many wetland species continue to decline. We suggest that the major factor limiting many wetland species, in addition to loss of wetlands, is not water quality, but the quality of the vegetation/habitat for

TABLE 1

Species	Scientific Name	Status	State E and T List	Habitat	Spring Bird Count Trend
Greater Prairie-Chicken	<i>Tympanuchus cupido</i>	Resident	Endangered	Grassland	-98.8%
Bewick's Wren	<i>Thryomanes bewickii</i>	Breeder / Migrant	Endangered	Shrubland / Forest	-95.8%
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Breeder / Migrant	Endangered	Grassland / Shrubland	-92.6%
Lesser Scaup	<i>Aythya affinis</i>	Migrant		Wetland	-89.3%
American Black Duck	<i>Anas rubripes</i>	Migrant		Wetland	-88.6%
American Golden-Plover	<i>Pluvialis dominica</i>	Migrant		Wetland	-86.1%
Upland Sandpiper	<i>Bartramia longicauda</i>	Breeder / Migrant	Endangered	Grassland	-85.6%
Dark-eyed Junco	<i>Junco hyemalis</i>	Migrant		Forest	-83.6%
House Sparrow	<i>Passer domesticus</i>	Resident		Urban	-83.1%
Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>	Migrant		Wetland	-80.2%
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Breeder / Migrant		Forest	-79.5%
Black Tern	<i>Chlidonias niger</i>	Breeder / Migrant	Endangered	Wetland	-78.0%
Northern Bobwhite	<i>Colinus virginianus</i>	Resident		Grassland	-77.4%
Common Grackle	<i>Quiscalus quiscula</i>	Breeder / Migrant		Urban / Agriculture	-75.9%
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Breeder / Migrant	Threatened	Forest	-75.6%
Horned Lark	<i>Eremophila alpestris</i>	Breeder / Migrant		Agriculture / Grassland	-75.5%
Ring-necked Pheasant	<i>Phasianus colchicus</i>	Resident		Grassland	-75.0%
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	Breeder / Migrant	Endangered	Wetland	-73.7%
Broad-winged Hawk	<i>Buteo platypterus</i>	Breeder / Migrant		Forest	-72.7%
Herring Gull	<i>Larus argentatus</i>	Migrant		Wetland	-72.4%
Rock Pigeon	<i>Columba livia</i>	Resident		Urban	-68.2%
Northern Pintail	<i>Anas acuta</i>	Migrant		Wetland	-67.6%
Common Nighthawk	<i>Chordeiles minor</i>	Breeder / Migrant		Urban / Grassland	-66.9%
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	Breeder / Migrant		Forest	-65.8%
Northern Flicker	<i>Colaptes auratus</i>	Breeder / Migrant		Forest	-65.1%
Eastern Meadowlark	<i>Stumella magna</i>	Breeder / Migrant		Grassland	-65.1%
Sanderling	<i>Calidris alba</i>	Migrant		Wetland	-63.6%
Wilson's Snipe	<i>Gallinago delicata</i>	Migrant		Wetland	-63.4%
Common Gallinule	<i>Gallinula galeata</i>	Breeder / Migrant	Endangered	Wetland	-63.1%
Brown Thrasher	<i>Toxostoma rufum</i>	Breeder / Migrant		Shrubland	-62.9%
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	Breeder / Migrant	Endangered	Wetland	-61.1%
Chimney Swift	<i>Chaetura pelagica</i>	Breeder / Migrant		Urban	-59.6%
Blue Jay	<i>Cyanocitta cristata</i>	Breeder / Migrant		Forest / Urban	-54.6%
Cerulean Warbler	<i>Setophaga cerulea</i>	Breeder / Migrant	Threatened	Forest	-53.9%
Little Blue Heron	<i>Egretta caerulea</i>	Breeder / Migrant	Endangered	Wetland	-52.0%

**Figure 3 - Some grassland, forest and common bird species experiencing large population declines in Illinois.**

wetland birds. Black terns are one of the most rapidly declining wetland species because they require a specific wetland type (hemi-marsh, equal parts open water and emergent vegetation). Given changes in the hydrology in many areas, water management is needed to preserve hemi-marsh conditions. Without active management, species such as black terns, common gallinules and yellow-headed blackbirds may be extirpated (completely removed) from Illinois. Many of the other wetland birds in decline are colonial waterbirds (black-crowned night-heron, little blue heron). These species need safe colonies in which to reproduce. Fewer and fewer colonies remain in Illinois, and efforts are needed to both protect existing colonies and create new colonies.

### Forest Birds

As with wetland birds, forest birds represent a suite of species with some experiencing increases, some with stable populations, and others experiencing large declines (Tables 1 and 2). While Illinois forest acreage remains much the same as it was more than a century ago, the composition of our forests continues to change due to the introduction of invasive species (e.g., buckthorn, honeysuckle). Additionally, historic disturbance regimes are often absent, resulting in dense closed-canopy forests. As a result, some forest species that prefer open woodlands and forests with open areas are experiencing declines, including red-headed woodpecker, black-billed cuckoo, eastern whip-poor-will, northern flicker, blue jay, and cerulean warbler (Figure 3). The once bountiful oak-hickory forests that provided food and a rich understory with insect diversity have seen great declines. Not all species have been negatively affected by the change in forest composition, as dense closed-canopy forests benefit certain species (e.g.,

Acadian flycatcher, great crested flycatchers, rose-breasted grosbeak). Management of forest is needed to provide the various habitat conditions in the forest to benefit multiple bird species.

### Common Birds in Steep Decline

It is doubtful that when Vern Kleen and others were conceiving the SBC they were overly concerned with monitoring the population trends of house sparrow, common grackles and rock pigeons. However, the population trends of these 'common' species are alarming. House sparrows have declined 83.1 percent over the last 50 years (Figure 3). While conservation resources should not be extended to conserve this exotic species (whose arrival negatively impacted other native species), when such a common species is declining at such a rapid rate it is a source of concern for our environment. Other urban species that are in decline are the common nighthawk and chimney swift, and efforts should be undertaken to determine why these species are declining and what can be done to help them.

### Migrants vs Breeders

The timing of the SBC provides interesting data on both breeding and migrating birds. Some species such as northern bobwhite are not migratory and thus the surveys represent the breeding population. Other species have individuals that breed in Illinois and individuals that breed north of Illinois (e.g., black-billed cuckoo). Some species are true migrants, passing through the state with no breeding population in Illinois (e.g., Canada warbler). In the case of species that only migrate through Illinois, only American white pelican, Caspian tern, gadwall, lesser yellowlegs, clay-colored sparrow, and greater yellowlegs

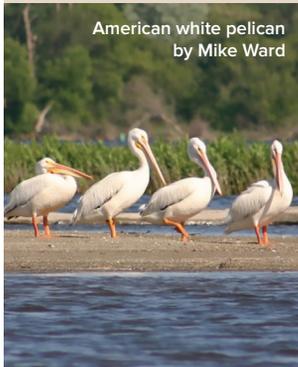


TABLE 2

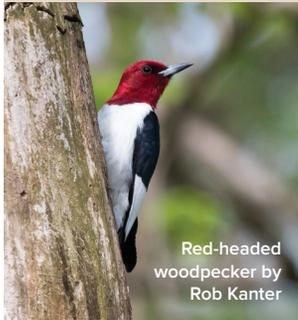
Species	Scientific Name	Status	State E and T list	Habitat	Spring Bird Count Trend
Canada Goose	<i>Branta canadensis</i>	Breeder / Migrant		Wetland / Urban	1,000+%
Mute Swan	<i>Cygnus olor</i>	Breeder / Migrant		Wetland / Urban	1,000+%
Hooded Merganser	<i>Lophodytes cucullatus</i>	Breeder / Migrant		Wetland	1,000+%
Wild Turkey	<i>Meleagris gallopavo</i>	Resident		Forest	1,000+%
Sandhill Crane	<i>Grus grus</i>	Breeder / Migrant		Wetland	1,000+%
Caspian Tern	<i>Hydroprogne caspia</i>	Migrant		Wetland	1,000+%
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Breeder / Migrant		Wetland	1,000+%
Black Vulture	<i>Coragyps atratus</i>	Breeder / Migrant		Generalist	1,000+%
Cooper's Hawk	<i>Accipiter cooperii</i>	Breeder / Migrant		Urban / Forest	1,000+%
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Breeder / Migrant		Wetland	1,000+%
Red-shouldered Hawk	<i>Buteo lineatus</i>	Breeder / Migrant		Forest	1,000+%
Barn Owl	<i>Tyto alba</i>	Breeder / Migrant		Grassland	1,000+%
Peregrine Falcon	<i>Falco peregrinus</i>	Breeder / Migrant		Urban / Wetland	1,000+%
Fish Crow	<i>Corvus ossifragus</i>	Breeder / Migrant		Generalist	1,000+%
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	Breeder / Migrant		Generalist	1,000+%
House Finch	<i>Haemorhous mexicanus</i>	Breeder / Migrant		Generalist	1,000+%
Henslow's Sparrow	<i>Centronyx henslowii</i>	Breeder / Migrant		Grassland	1,000+%
Blue Grosbeak	<i>Passerina caerulea</i>	Breeder / Migrant		Shrubland	1,000+%
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	Resident		Urban	1,000+%
American White Pelican	<i>Pelecanus erythrorhynchos</i>	Migrant		Wetland	1,000+%
Bell's Vireo	<i>Vireo bellii</i>	Breeder / Migrant		Shrubland	919.5%
Turkey Vulture	<i>Cathartes aura</i>	Breeder / Migrant		Generalist	848.3%
Summer Tanager	<i>Piranga rubra</i>	Breeder / Migrant		Shrubland / Forest	690.5%
Great Egret	<i>Ardea alba</i>	Breeder / Migrant		Wetland	684.4%
Sedge Wren	<i>Cistothorus platensis</i>	Breeder / Migrant		Grassland	635.7%
Mississippi Kite	<i>Ictinia mississippiensis</i>	Breeder / Migrant		Forest	550.2%
Northern Parula	<i>Setophaga americana</i>	Breeder / Migrant		Forest	505.8%
Eastern Phoebe	<i>Sayornis phoebe</i>	Breeder / Migrant		Urban / Forest	434.5%
Osprey	<i>Pandion haliaetus</i>	Breeder / Migrant	Threatened	Wetland	410.8%
Gadwall	<i>Mareca strepera</i>	Migrant		Wetland	402.0%
Chipping Sparrow	<i>Spizella passerina</i>	Breeder / Migrant		Urban / Shrubland	393.2%
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	Breeder / Migrant		Forest	364.9%
Marsh Wren	<i>Cistothorus palustris</i>	Breeder / Migrant		Wetland	359.4%
Savannah Sparrow	<i>Passerculus sandwichensis</i>	Breeder / Migrant		Grassland	358.4%
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	Breeder / Migrant		Forest	297.4%
Carolina Wren	<i>Thryothorus ludovicianus</i>	Resident		Urban / Forest	253.3%
Pine Warbler	<i>Setophaga pinus</i>	Breeder / Migrant		Forest	240.3%
Worm-eating Warbler	<i>Helmitheros vermivorum</i>	Breeder / Migrant		Forest	231.2%
Willow Flycatcher	<i>Empidonax traillii</i>	Breeder / Migrant		Shrubland	221.6%
Yellow-throated Warbler	<i>Setophaga dominica</i>	Breeder / Migrant		Forest	214.9%
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Resident		Forest	213.5%
Yellow-throated Vireo	<i>Vireo flavifrons</i>	Breeder / Migrant		Forest	210.7%
Great Blue Heron	<i>Ardea herodias</i>	Breeder / Migrant		Wetland	203.1%
American Redstart	<i>Setophaga ruticilla</i>	Breeder / Migrant		Forest	198.7%
Lesser Yellowlegs	<i>Tringa flavipes</i>	Migrant		Wetland	195.9%
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Breeder / Migrant		Forest / Grassland	184.4%
Barred Owl	<i>Strix varia</i>	Resident		Forest	176.5%
Yellow Warbler	<i>Setophaga petechia</i>	Breeder / Migrant		Shrubland	172.0%
Blue-winged Warbler	<i>Vermivora cyanoptera</i>	Breeder / Migrant		Shrubland	166.8%
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Resident		Forest	162.1%
Dickcissel	<i>Spiza americana</i>	Breeder / Migrant		Grassland	161.9%
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	Resident		Forest	161.7%
Louisiana Waterthrush	<i>Parkesia motacilla</i>	Breeder / Migrant		Forest	158.8%
Acadian Flycatcher	<i>Empidonax virescens</i>	Breeder / Migrant		Forest	158.4%
Forster's Tern	<i>Sterna forsteri</i>	Breeder / Migrant	Endangered	Wetland	158.3%
Kentucky Warbler	<i>Geothlypis formosa</i>	Breeder / Migrant		Forest	157.2%
Clay-colored Sparrow	<i>Spizella pallida</i>	Migrant		Shrubland	154.3%
Greater Yellowlegs	<i>Tringa melanoleuca</i>	Migrant		Wetland	152.6%
Warbling Vireo	<i>Vireo gilvus</i>	Breeder / Migrant		Forest	148.5%
Eastern Wood-Pewee	<i>Contopus virens</i>	Breeder / Migrant		Forest	141.5%
Red-eyed Vireo	<i>Vireo olivaceus</i>	Breeder / Migrant		Forest	135.2%
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Breeder / Migrant		Shrubland / Grassland	118.9%
Tree Swallow	<i>Tachycineta bicolor</i>	Breeder / Migrant		Wetland / Grassland	118.0%
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Breeder / Migrant		Forest	117.9%
Orchard Oriole	<i>Icterus spurius</i>	Breeder / Migrant		Shrubland	114.4%
White-eyed Vireo	<i>Vireo griseus</i>	Breeder / Migrant		Forest	110.3%
Scarlet Tanager	<i>Piranga olivacea</i>	Breeder / Migrant		Forest	107.6%
Hooded Warbler	<i>Setophaga citrina</i>	Breeder / Migrant		Forest	106.4%
American Kestrel	<i>Falco sparverius</i>	Breeder / Migrant		Grassland	105.5%
Ring-billed Gull	<i>Larus delawarensis</i>	Breeder / Migrant		Wetland / Urban	103.1%



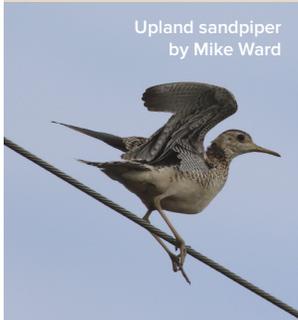
Henslow's sparrow by Leroy Harrison



American white pelican by Mike Ward



Red-headed woodpecker by Rob Kanter



Upland sandpiper by Mike Ward





have shown dramatic increases in population (Table 2; we are aware that some of these species have bred in Illinois, but their breeding population is small). The reason these migrants are being detected in greater numbers in Illinois is not clear and is likely due to many factors, including increases in their overall population, changes in migratory routes, or changes in timing of migration.

To the contrary, there are other species that only migrate through Illinois that have seen declines. Nine of these species (Table 1) have shown steep declines. Many of these nine species have global populations known to be relatively stable (Bonaparte's gull and dark-eyed junco). Several are waterfowl species (lesser scaup, American black duck, northern pintail). One factor that may be influencing the number of a given species that are in Illinois in early May is climate change. Over the last 50 years, in general, spring is arriving earlier. Additional data analysis is planned to investigate the role of spring's arrival on the abundance of birds in Illinois on the SBC. One species that climate change seems to be affecting is dark-eyed junco. Juncos are a common winter bird in Illinois, but the number of juncos found on the SBC has declined over time (Figure 4). It may be that the warmer climate both in Illinois and their breeding grounds to the north allow juncos to leave Illinois earlier in the spring. The same changes may be occurring with waterfowl; however, we stress that more in-depth research is needed to determine the role of climate on population trends from the SBC. A good example of the variability of population trends for migratory species is shorebirds, which often fly long distances to get to their breeding grounds and are at an increased risk of the effects of climate change as a result (Figure 5).

The SBC also provides interesting data on the distribution of birds over time. Several migratory species that breed in Illinois appear to have



Loggerhead shrike  
by Leroy Harrison

Figure 4 - Dark-eyed junco population change in Illinois.

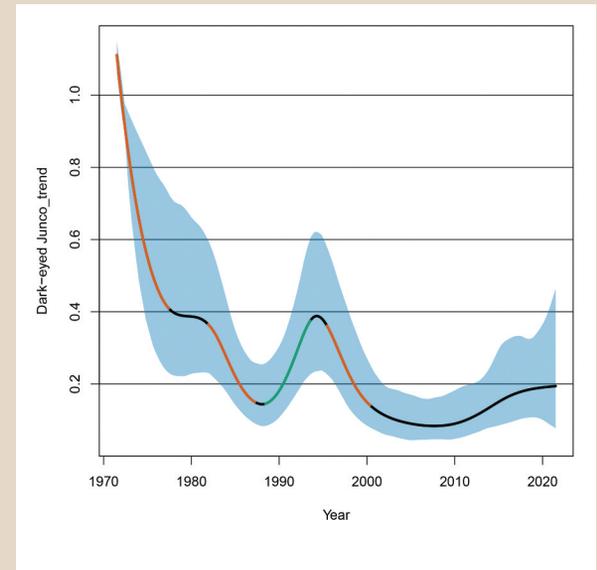
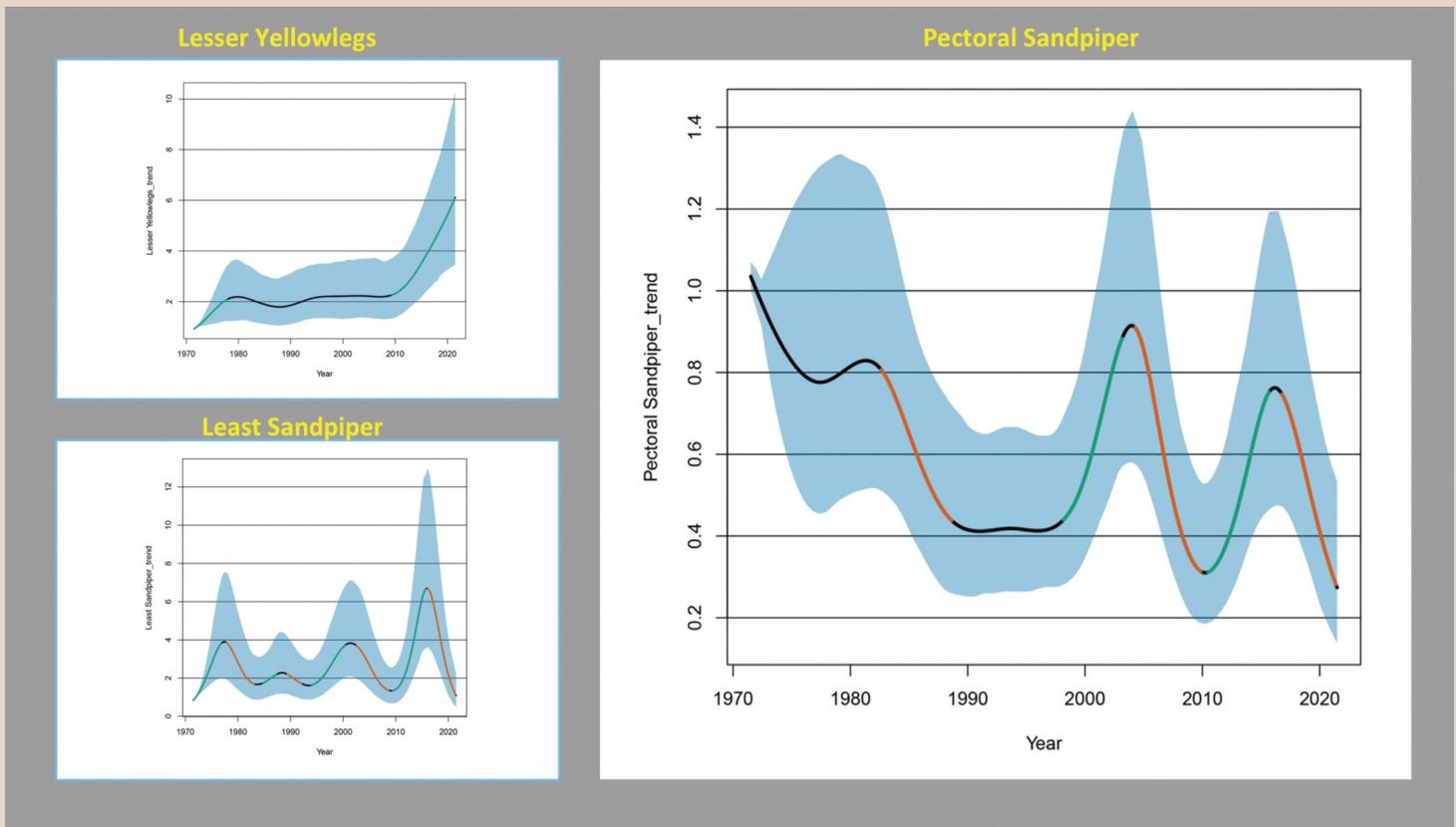


Figure 5 - Variability of population trends for migrating shorebirds.

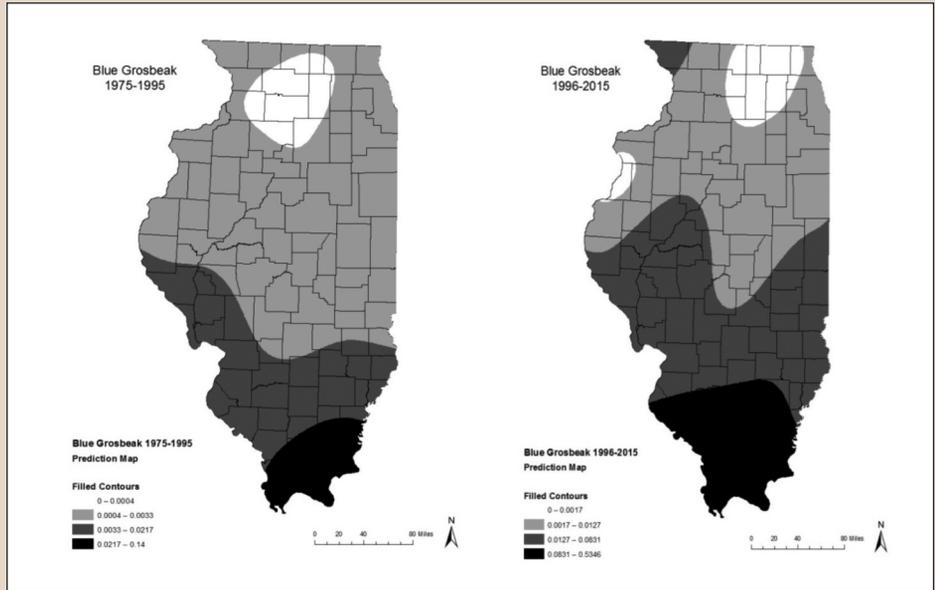




Blue grosbeak by Rob Kanter

expanded their populations north over time (blue-gray gnatcatcher, black vulture, blue grosbeak, summer tanager). Figure 6 highlights the expansion of blue grosbeak north. The continued data from the SBC will provide more data to understand how species' distributions are changing. ■

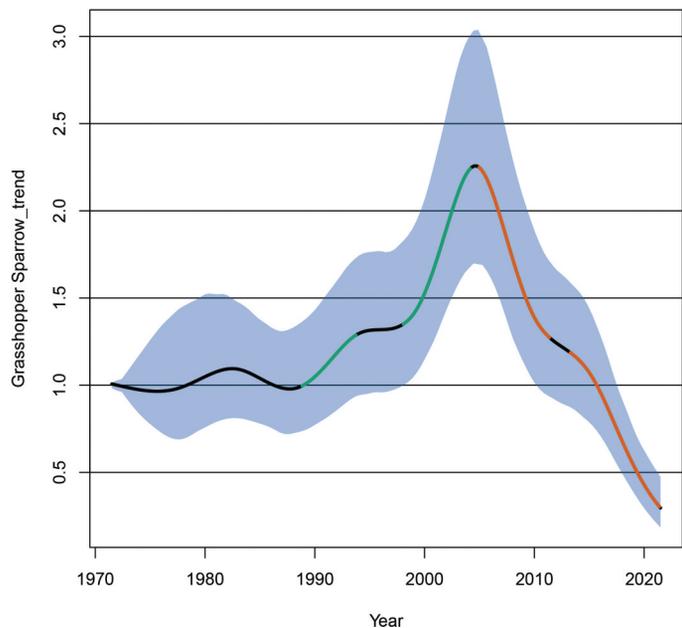
Figure 6 - Expansion of the blue grosbeak population over time.



## Methods

The SBC population trend estimates were produced via poptrend package in Program R. We used multiple approaches [Generalized Additive Models (smooth), Log-linear Models (log)] to estimate population trends and used a conservative approach to identify species that increased or decreased in population. However, the variability and rapid changes in populations sometimes results in very different estimates. One interesting example is that of the grasshopper sparrow. The smooth model estimated a population decline of -66.5 percent (confidence interval -48.3 to -78.2); however, the log model estimated a 12.1 percent increase with a confidence interval that overlapped zero (-4.4 to 27.9) suggesting that the population was likely unchanged. Figure 7 shows how grasshopper sparrows were stable until 1990 (the green line suggests a population increase), increasing until the early 2000s, followed by a dramatic decline (red line). In 1992, roughly five times as many grasshopper sparrows were recorded than in 2021. These rapid changes in population suggest close attention should be paid to the grasshopper sparrow population.

Figure 7 - Grasshopper sparrow population changes in Illinois.



### BIO

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