

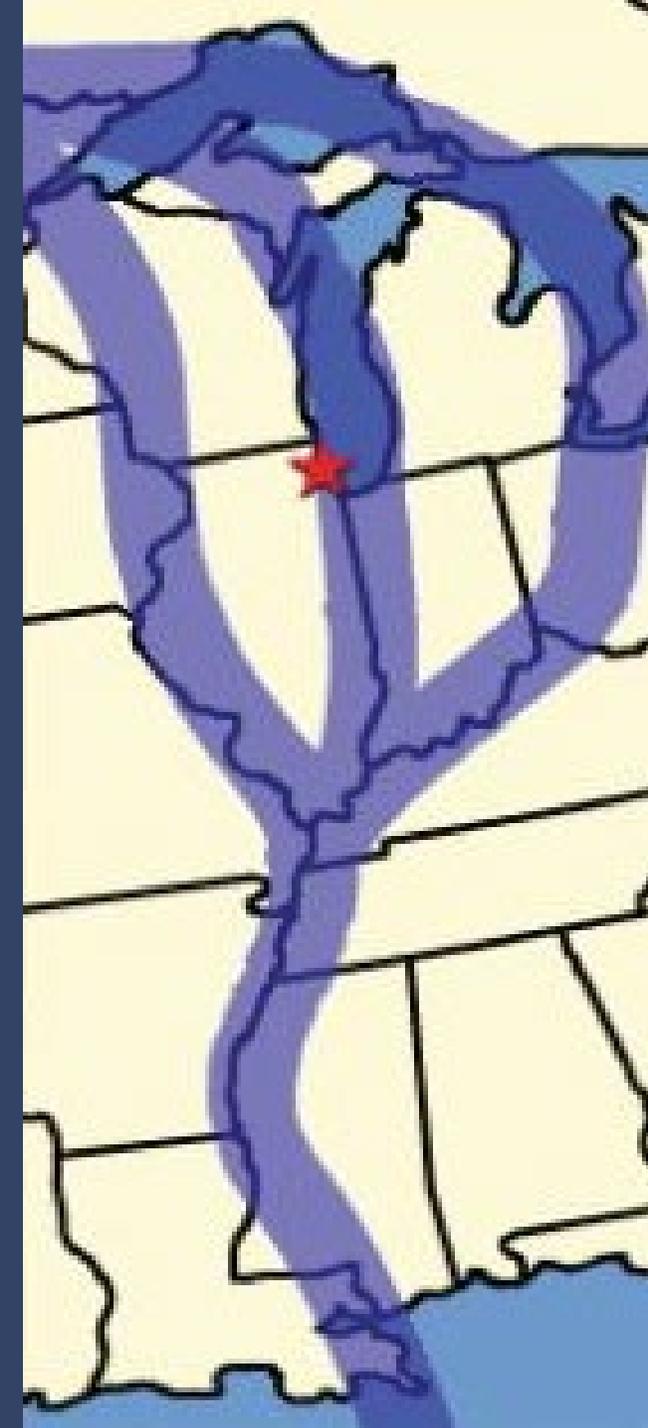
THE CHICAGO WILDERNESS REGION A CRITICAL MIGRATORY BIRD CORRIDOR: THREATS AND OPPORTUNITIES

PRESENTED BY: BOB FISHER & ERIC SECKER
CW CAFÉ - APRIL 4, 2024



THE CW REGION FLYWAY IS IMPORTANT!

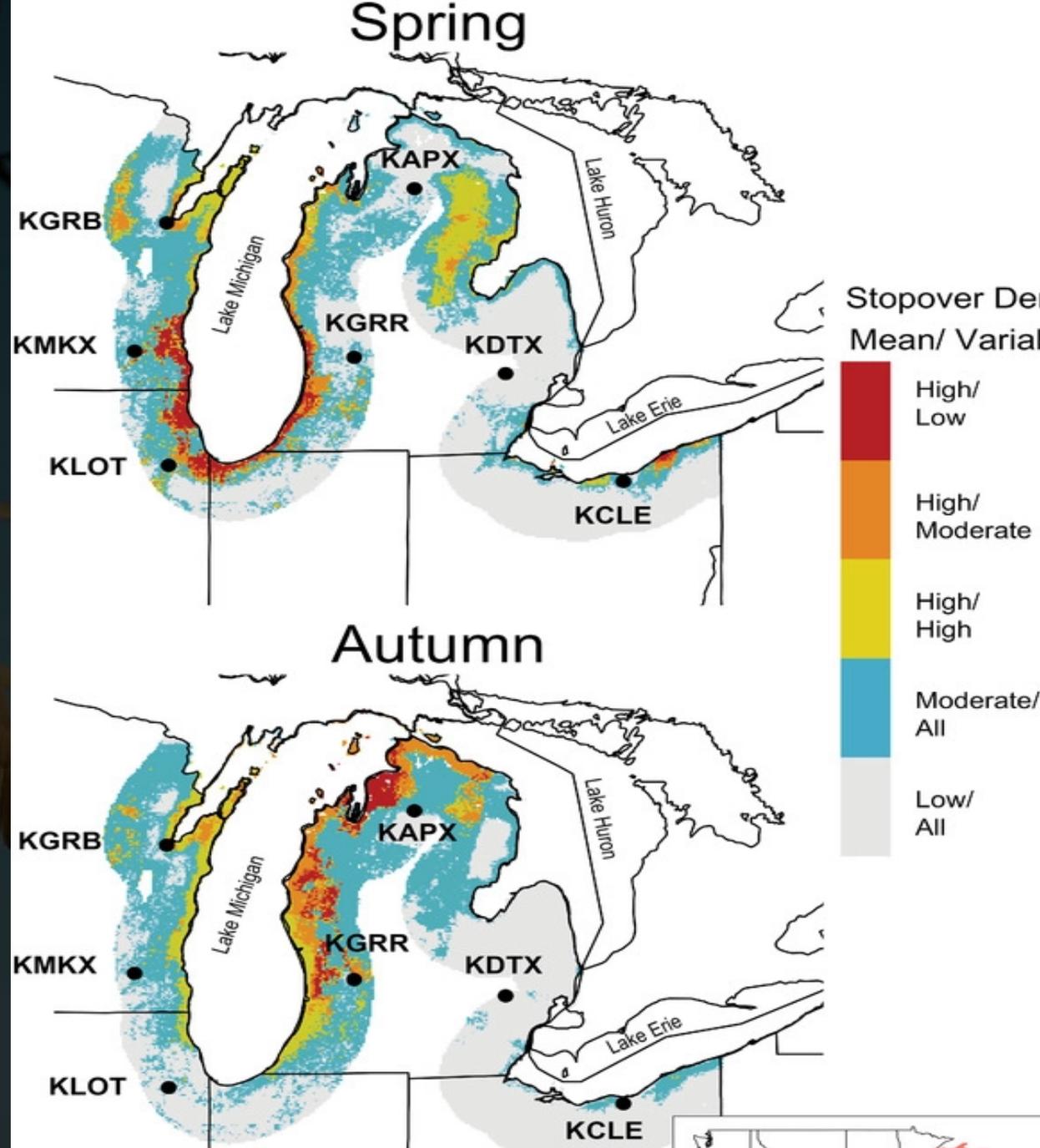
- Abundant migrant counts are NOT artifacts of more observers or easier detection.
- Migratory species move through narrow corridors in the Midwest's Central Flyway.
- Migratory 'bird unfriendly' habitat and geographic barriers channel migratory birds through the CW Region (which has added human-source hazards).
- Research advances in tracking and mapping underline the importance of greenbelts, riverways, corridors and 'migration islands' to our many migratory bird species.



THE GREAT LAKES: SCALE OF PASSERINE NOCTURNAL MIGRATION

...a mean total of 0.55 *billion* birds pass north through Lake Michigan and western Lake Erie each spring; 0.86 *billion* go south each fall... approx. 20-25% of all the birds migrating across our north border.

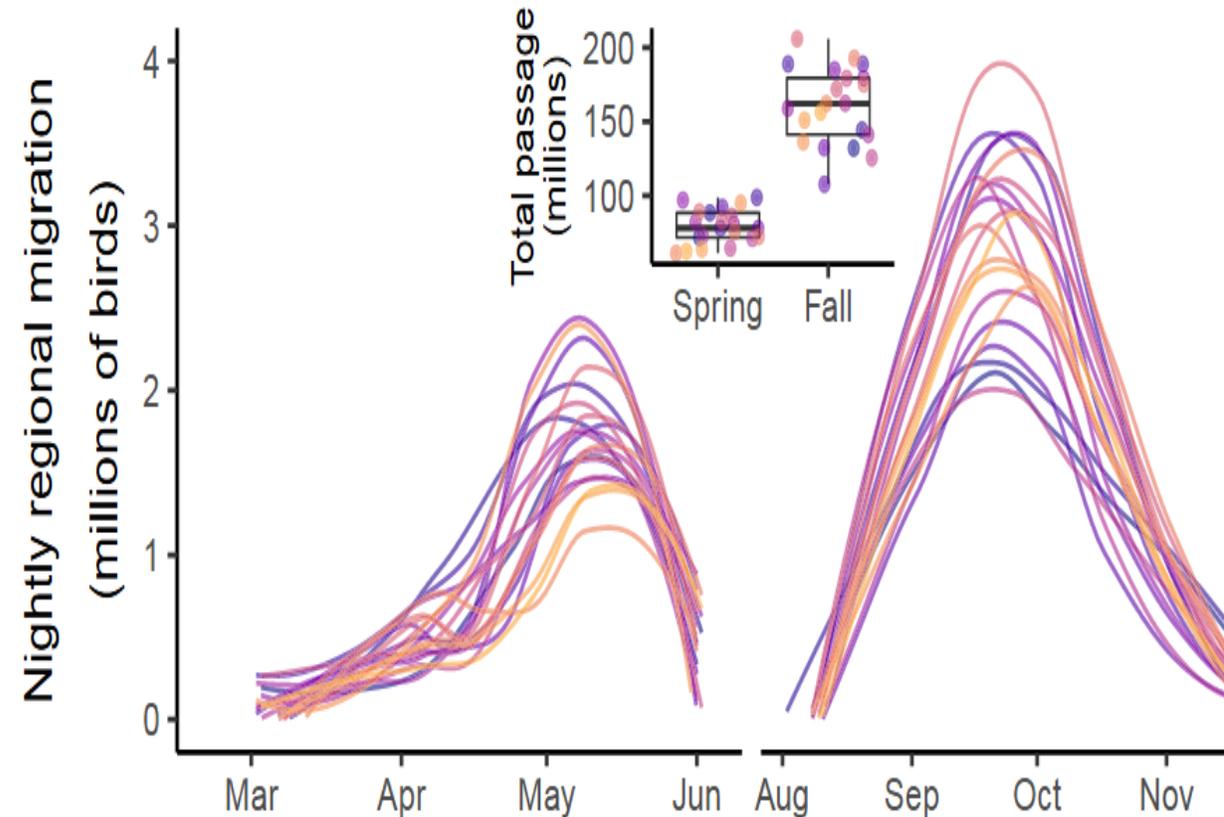
Professor J. Buler
University of Delaware (pers. comm.).



(Cohen, et. al 2022)

THE CW REGION: SCALE OF PASSERINE NOCTURNAL MIGRATION

...approx. 80 million birds pass north through the CW Region along the west side of Lake Michigan each spring; 150 million go south each fall.



Summed annual migration passage at the KLOT radar in estimated number of individual birds (years colored). (*Lower, Inset*) Summed seasonal passage totals in estimated number of birds crossing a 75-km transect, with each point representing a year.

Van Doren, et al. Drivers of fatal bird collisions in an urban center
June 2021 Proceedings of the National Academy of Sciences
118(24):e210166611

PORTABLE RADAR: CAPABLE OF NOCTURNAL MIGRATORY BIRD PASSAGE COUNTS OVER WATER

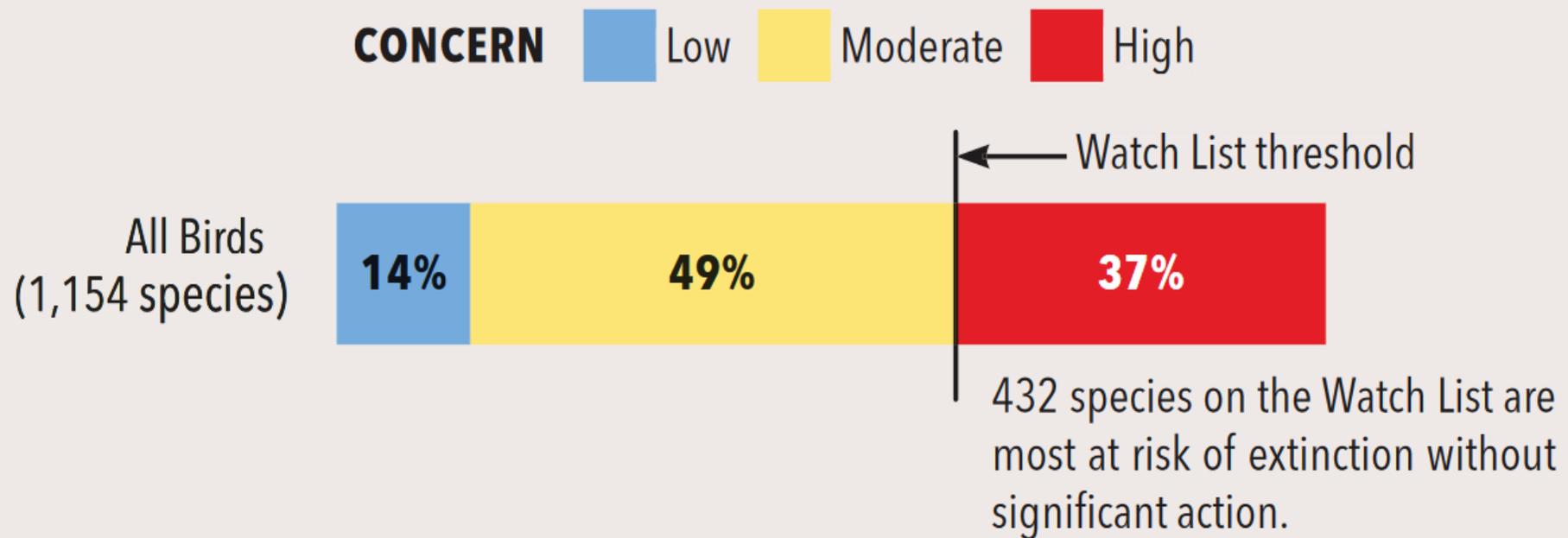
THE GREAT LAKES AIRSPACE MAP: A DECISION SUPPORT TOOL

U.S. Fish and Wildlife Service,
R3 Ecological Services 2/4/2022



BIRDS OF CONCERN

ONE-THIRD OF ALL NORTH AMERICAN BIRD SPECIES NEED URGENT CONSERVATION ACTION



POPULATION CHANGES: BOREAL WARBLERS

	pop. Change/yr	46 yr change	est. population 2017
Northern Waterthrush	1.21	51.18	17,000,000
Tennessee Warbler	-0.44	-45.33	110,000,000
Nashville Warbler	0.61	4.79	40,000,000
Connecticut Warbler	-1.13	-59.42	1,800,000
Mourning Warbler	-0.86	-47.49	14,000,000
Cape May Warbler	0.10	-33.58	7,000,000
Magnolia Warbler	1.09	34.85	39,000,000
Bay-breasted Warbler	0.63	-18.31	9,900,000
Blackburnian Warbler	0.61	10.56	13,000,000
Chestnut-sided Warbler	-0.86	-42.34	18,000,000
Blackpoll Warbler	-2.78	-83.95	60,000,000
Black-throated Blue Warbler	2.23	119.68	2,400,000
Yellow-rumped Warbler	0.15	-4.97	170,000,000
Black-throated Green Warbler	0.84	24.94	9,200,000
Canada Warbler	-1.80	-64.97	2,600,000
Wilson's Warbler	-1.27	-52.38	81,000,000



BLACKPOLL WARBLER POPULATION

1970: 300+ million!

2017: 60 million

2023: 51 million (projected)

POPULATION CHANGES: AERIAL INSECTIVORES

	pop.trend/yr	pop. Change 46 yrs	est NA pop. 2017
Great Crested Flycatcher	0.02	0.65	8,800,000
Eastern Kingbird	-1.19	-42.97	26,000,000
Olive-sided Flycatcher	-2.97	-75.60	1,900,000
Eastern Wood-Pewee	-1.32	-46.45	6,500,000
Yellow-bellied Flycatcher	2.42	193.30	13,000,000
Acadian Flycatcher	-0.18	-8.04	5,200,000
Alder Flycatcher	-0.56	-28.38	120,000,000
Willow Flycatcher	-1.25	-28.07	8,100,000
Least Flycatcher	-1.78	-56.90	27,000,000
Bank Swallow	-4.63	-88.75	7,900,000
Tree Swallow	-1.15	-41.80	19,000,000
N Rough-winged Swallow	-0.42	-17.73	20,000,000
Purple Martin	-0.69	-27.67	8,700,000
Barn Swallow	-1.09	-40.19	47,000,000
Cliff Swallow	0.86	48.96	78,000,000
Common Nighthawk	-1.79	-57.06	22,000,000
Eastern Whip-poor-will	-2.71	-72.09	1,800,000
Chimney Swift	-2.60	-70.99	8,800,000



EASTERN KINGBIRD POPULATION

1970: 45+ million

2017: 26 million

2023: 24 million (projected)

POPULATION CHANGES: SPARROWS

	pop.trend/yr	population change	est. na population/2017
Clay-colored Sparrow	-1.23	-44.07	60,000,000
Fox Sparrow	-1.29	-43.45	35,000,000
American Tree Sparrow	-1.82	-57.66	26,000,000
White-throated Sparrow	-0.98	-36.74	160,000,000
Vesper Sparrow	-0.88	-33.95	35,000,000
LeConte's Sparrow	-2.22	-64.22	5,100,000
Nelson's Sparrow	2.11	146.95	1,000,000
Baird's Sparrow	-2.39	-67.67	3,400,000
Henslow's Sparrow	-0.57	-23.59	410,000
Savannah Sparrow	-1.29	-45.61	170,000,000
Lincoln's Sparrow	-0.06	-2.46	88,000,000



HENSLOW'S SPARROW POPULATION
Just under 540,000 were present
in North America 50 years ago

BCN MIGRANT BIRDS OF CONCERN



- **Based on Partners in Flight scores for species that migrate through & breed north of the CW Region**

(Upper Mississippi River & Great Lakes Joint Venture's Habitat Strategies for Shorebirds, Waterfowl and Waterbirds for non-PIF species)

- **Many selected species migrate through the CW Region in high densities!**

INCLUDES MANY WOODLAND & SHRUBLAND SPECIES

WOODLANDS, SHRUBLANDS, GRASSLANDS

Canada Warbler (25)

Golden-winged Warbler (25)

Connecticut Warbler (25)

LeConte's Sparrow (24)

Smith's Longspur (24)

Veery (24)

Black-billed Cuckoo (b) (24)

Red-headed Woodpecker (b) (24)

Blackpoll Warbler (23)

Cape May Warbler (22)

Cerulean Warbler (b) (22)

Bay-breasted Warbler (21)

Black-and-white Warbler (21)

Nelson's Sparrow (21)

Eastern Whip-poor-will (b) (21)

Mourning Warbler (20)

Olive-sided Flycatcher (20)

Purple Finch (20)

Rusty Blackbird (20)

Philadelphia Vireo (19)

Palm Warbler (18)

(##): BCN Birds of Concern Score (higher number = more concern)

OTHER MIGRANT BIRDS OF CONCERN

WETLANDS, LAKES, LAKESHORE

- Yellow Rail (25)
- Whooping Crane (25)
- American Golden-Plover (24)
- Buff-breasted Sandpiper (24)
- Red Knot (23)
- Hudsonian Godwit (21)
- Ruddy Turnstone (21)
- American Black Duck (20)
- Canvasback (20)
- Pectoral Sandpiper (19)
- Solitary Sandpiper (18)

- Common Loon (17)
- Black-crowned Night-Heron (b) (17)
- Short-billed Dowitcher (16)
- Semipalmated Sandpiper (14)
- Lesser Yellowlegs (13)
- Lesser Scaup (13)

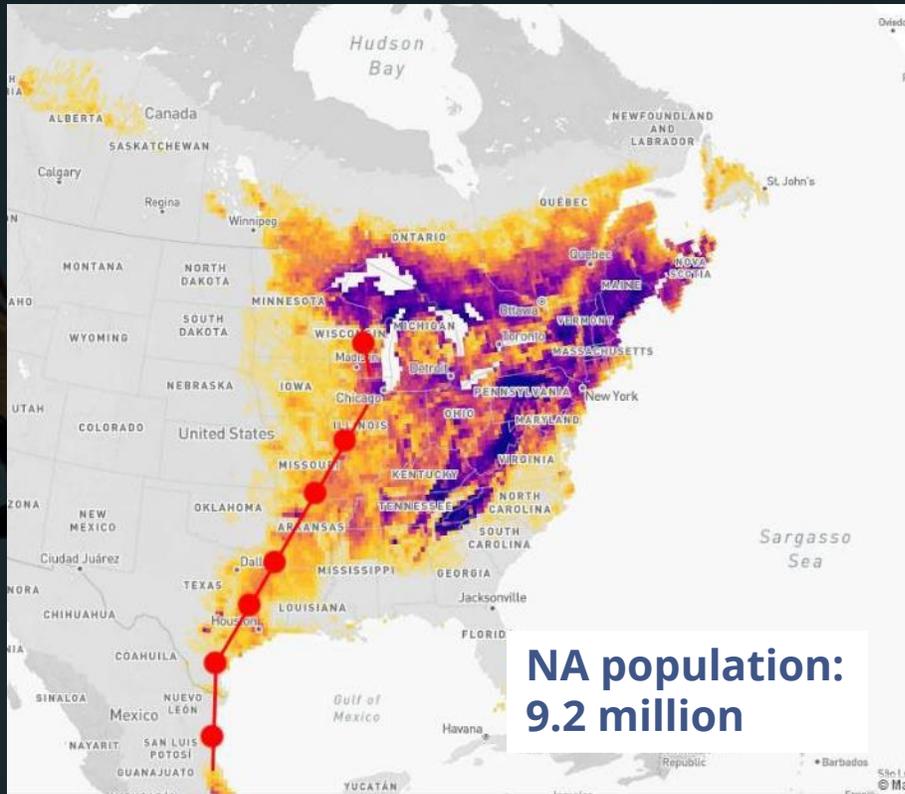
WINTER

- Long-eared Owl (20)
- American Tree Sparrow (16)
- Short-eared Owl (15)
- Northern Saw-whet Owl (14)

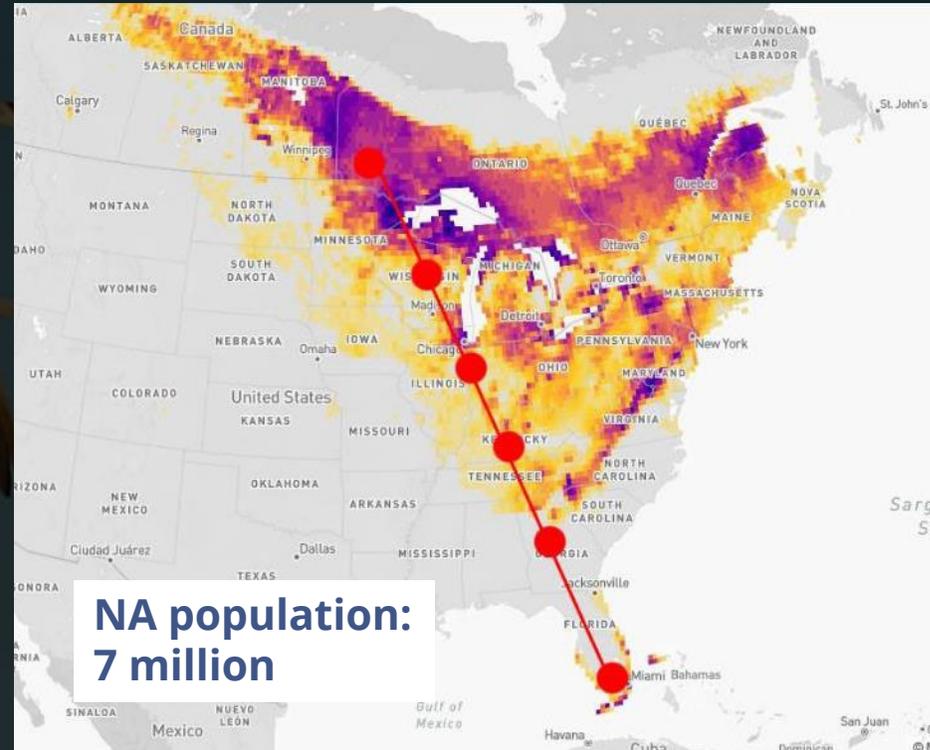
VIEW THE FULL LIST AT: www.bcnbirds.org/trends21/concern.html

A CRITICAL CORRIDOR FOR SPECIES FROM BOTH SIDES OF THE GULF

BLACK-THROATED GREEN WARBLER



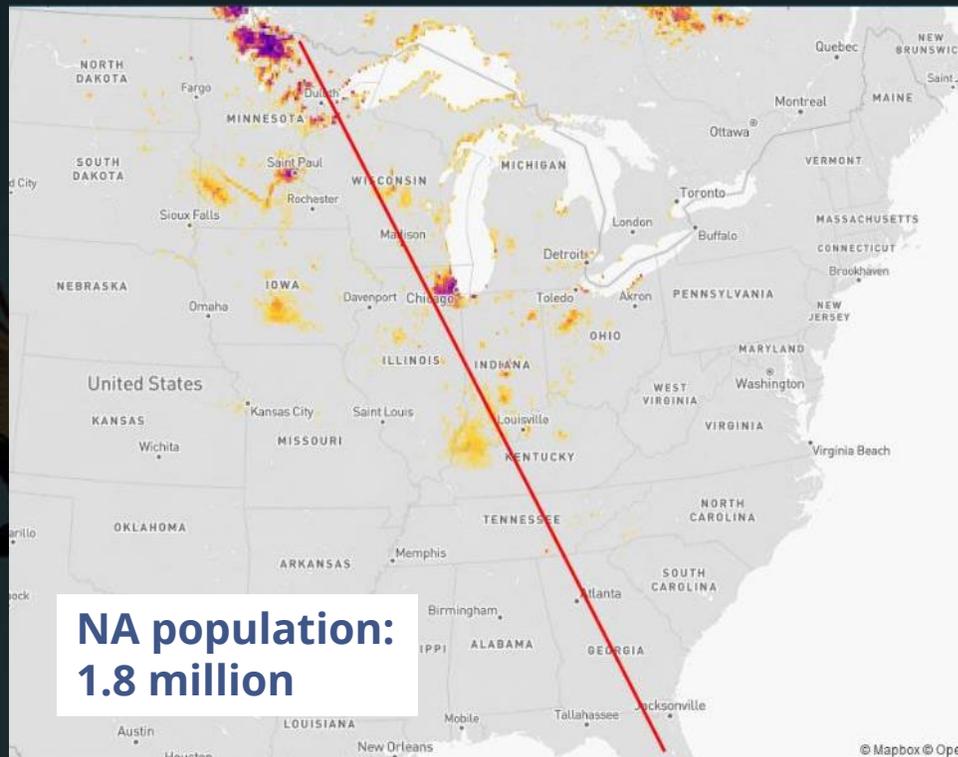
CAPE MAY WARBLER



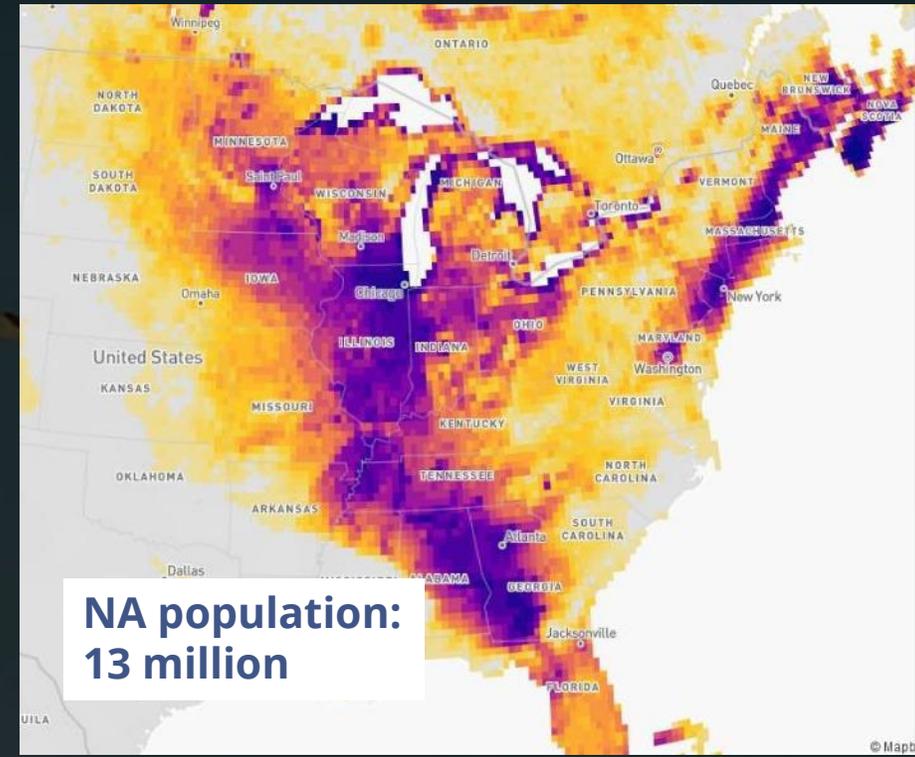
Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, S. Ligocki, O. Robinson, W. Hochachka, L. Jaromczyk, A. Rodewald, C. Wood, I. Davies, A. Spencer. 2022. eBird Status and Trends, Data Version: 2021; Released: 2022. Cornell Lab of Ornithology, Ithaca, New York.

BOTH RARE AND COMMON SPECIES RELY ON THE CW REGION

CONNECTICUT WARBLER



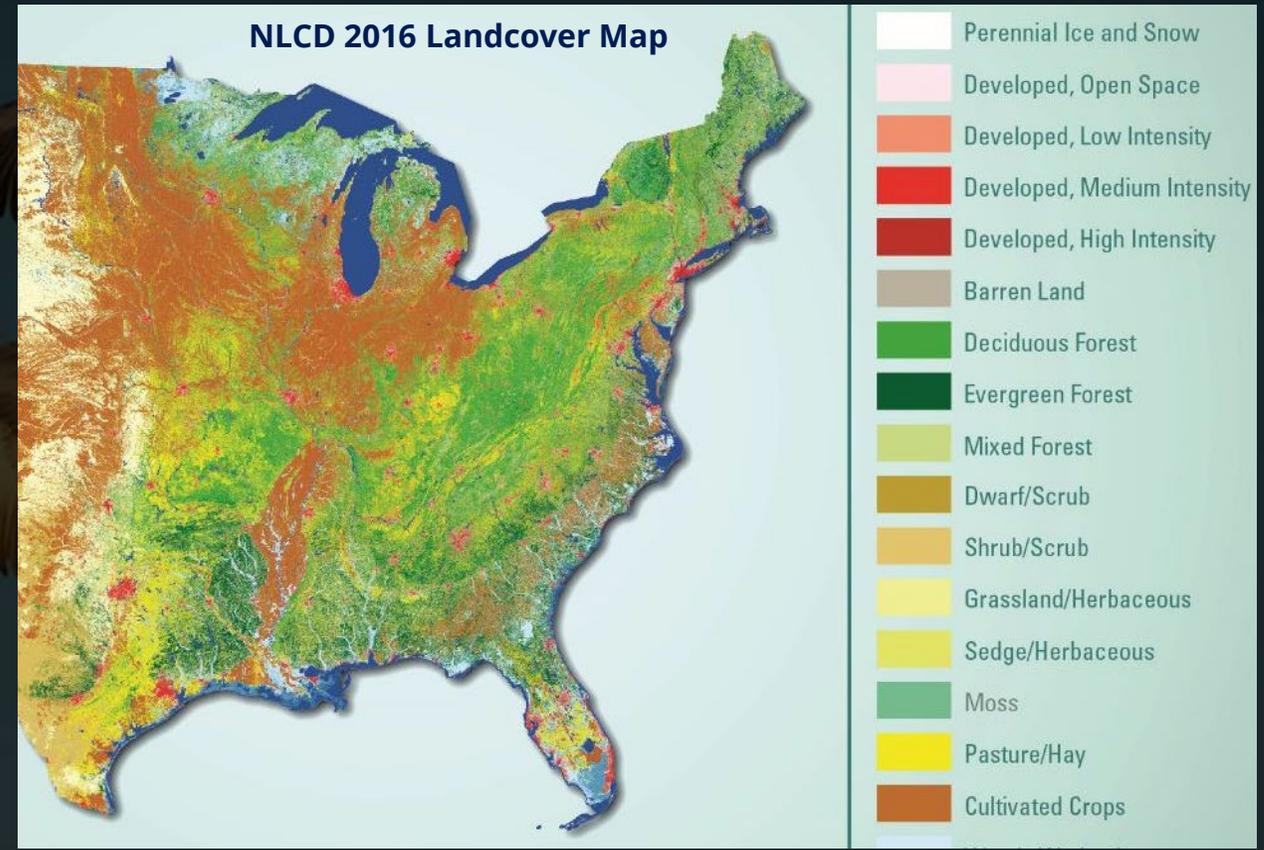
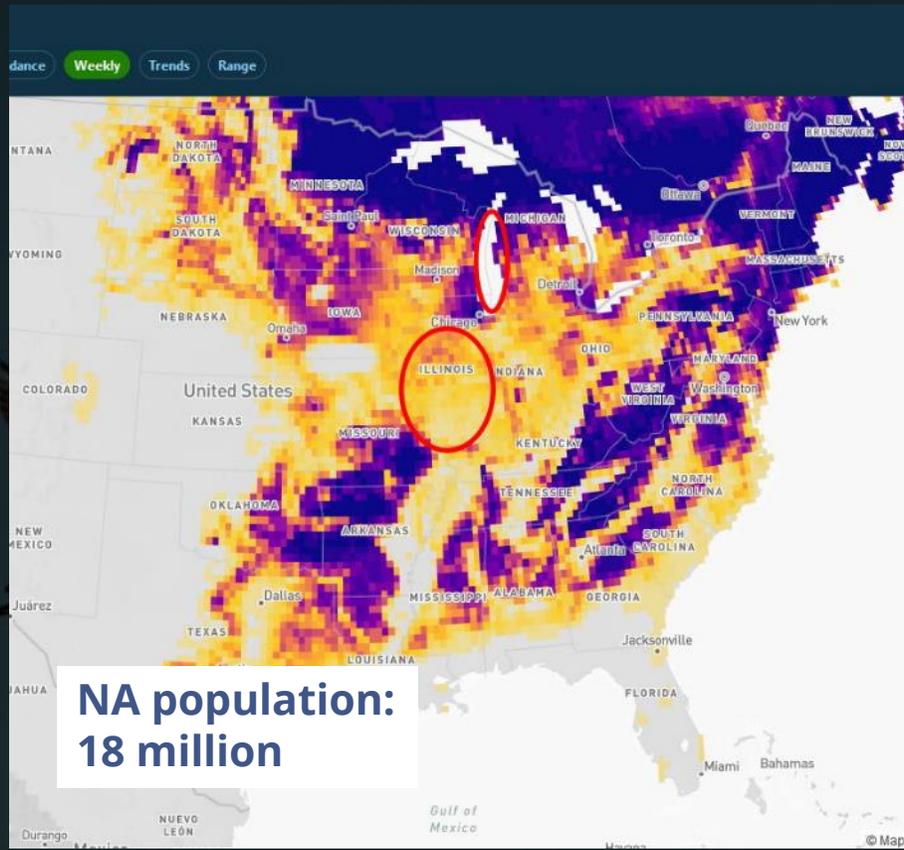
PALM WARBLER



Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, S. Ligocki, O. Robinson, W. Hochachka, L. Jaromczyk, A. Rodewald, C. Wood, I. Davies, A. Spencer. 2022. eBird Status and Trends, Data Version: 2021; Released: 2022. Cornell Lab of Ornithology, Ithaca, New York.

AGRICULTURAL AND GEOGRAPHIC BARRIERS MAKE THE CW REGION EVEN MORE IMPORTANT

BLACK-AND-WHITE WARBLER



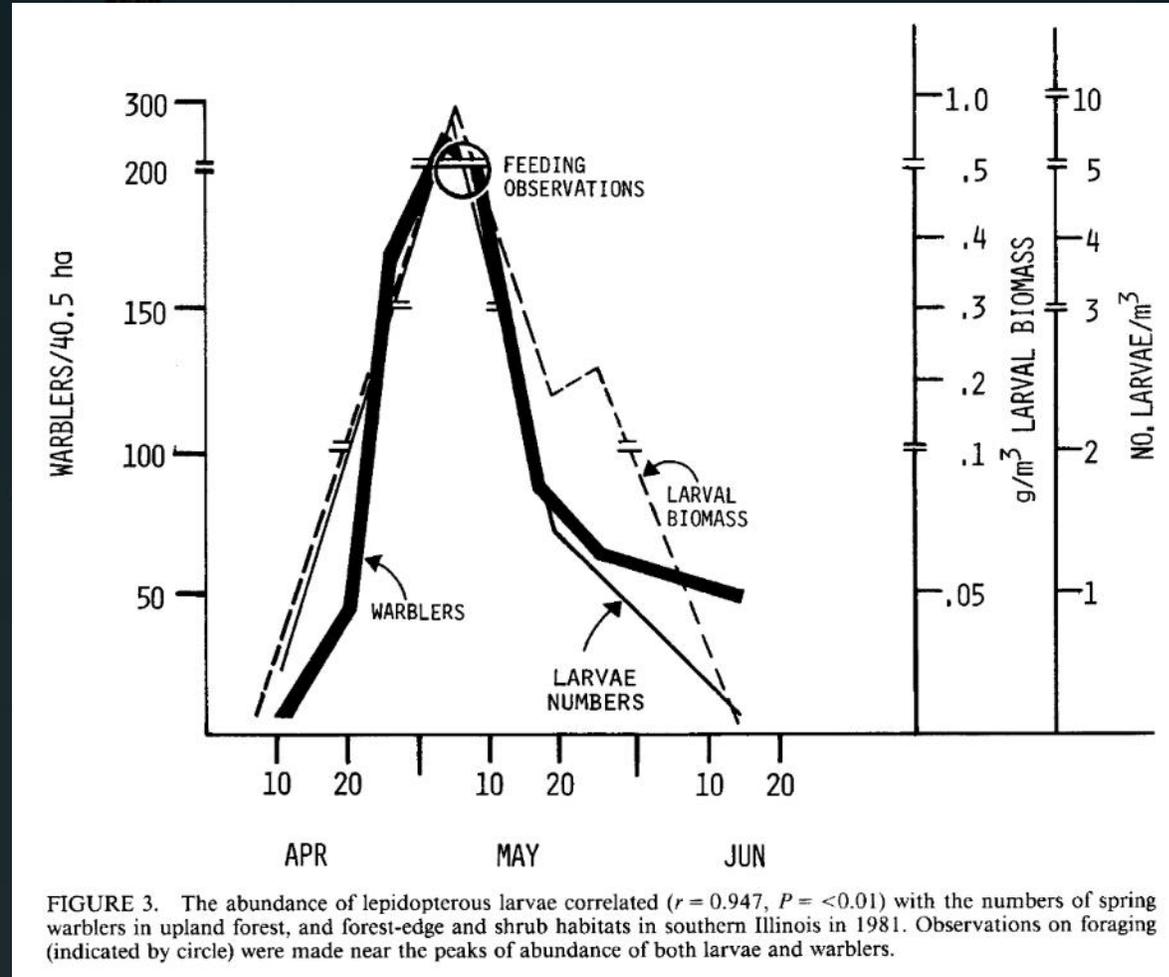
Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, S. Ligocki, O. Robinson, W. Hochachka, L. Jaromczyk, A. Rodewald, C. Wood, I. Davies, A. Spencer. 2022. eBird Status and Trends, Data Version: 2021; Released: 2022. Cornell Lab of Ornithology, Ithaca, New York.

WHY ARE WARBLERS IMPORTANT AND VULNERABLE?

- Compared to slightly larger sparrows, warblers must “process five times as much food to consume the same calories, costing [them] time, even with an unlimited food supply.”
- Warblers are great indicator species.



RELATION BETWEEN WARBLER MIGRATION AND FOOD SOURCE



A 1979-81 central and southern Illinois study on the Feeding Rates of Warblers in Spring by Jean W. Graber and Richard R. Graber.

HABITAT AND FOOD NEEDS OF WARBLERS

- In Graber and Graber's study, oaks held 60% of the warblers food source and up to 90% for Tennessee Warblers. In central Illinois "where food was scarce," cherry trees held 12% of their food source.
- "Lepidoptera larvae constituted 95% of the total invertebrate biomass available on forest-edge foliage in the south, and 75% in the central."

Graber, Jean W., and Richard R. Graber. "Feeding Rates of Warblers in Spring." *The Condor*, vol. 85, no. 2, 1983, pp. 139-50. <https://doi.org/10.2307/1367247>.



MAINTAINING A DIVERSITY OF FOOD SOURCES

- Although oaks are important, different species have different habitat and food preferences. Shrub and understory-loving species are more selective.
- Species also rely on a wider variety of food sources and plant species in early spring or during extreme weather events **which are increasing**.



Petit, Daniel R. "Habitat Use by Landbirds along Nearctic-Neotropical Migration Routes: Implications for Conservation of Stopover Traits." *Studies in Avian Biology*, Vol. 20, 2020, pp. 15-33.

NEEDS OF EARLY ARRIVING WARBLERS

Early arriving warblers and those arriving when food sources are not optimal have a much greater reliance on habitats with:

- **Dense and Diverse Foliage Compositions**
- **Fruit and Flower Bearing Shrubs and Trees**
 - **Increased Understory**
 - **Nearby Water or Waterways**



MOST USED FEATURES: CANOPY TREES, BRANCHES OVER THE RIVER & NATIVE SHRUBS. ALSO EDGES & MULTI-LAYERED VEG.

“This validates the premise of the bird-focused restoration – that many migratory birds are using LaBagh’s shrub and understory layers, and... during restoration a special attempt should be made to preserve them.”

Stewards should continue to pay special attention to:
Restoring Riverbank Vegetation, Creating Multi-layered Habitat, Protecting Existing Native Shrubs & Creating Dense Brushy Areas with Shrub Plantings.”

<https://chicagobirdalliance.org/blog/2024/3/29/what-features-attract-migrants>

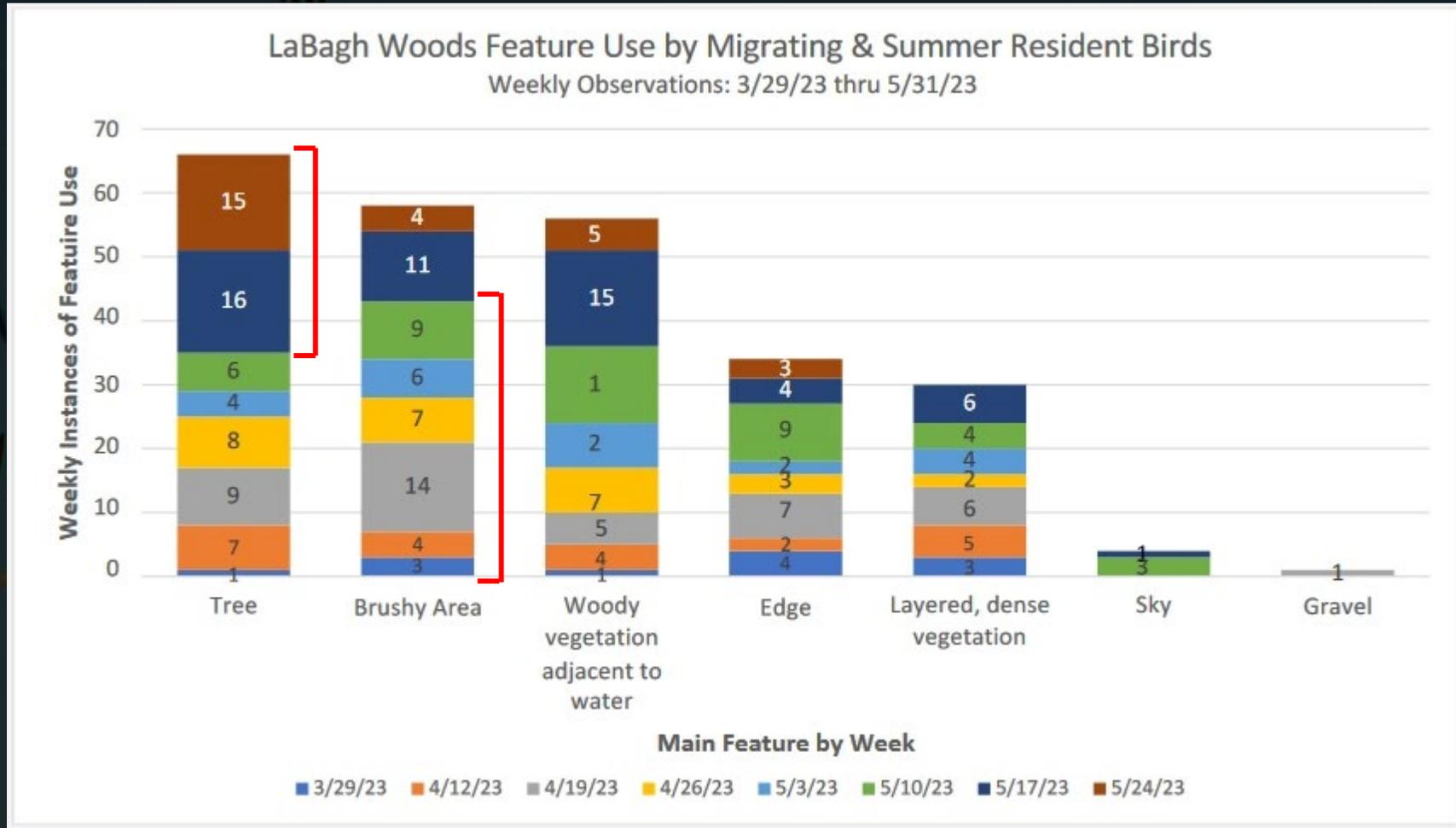
Migratory Bird Feature Usage at LaBagh Woods

Pilot Study
Spring 2023

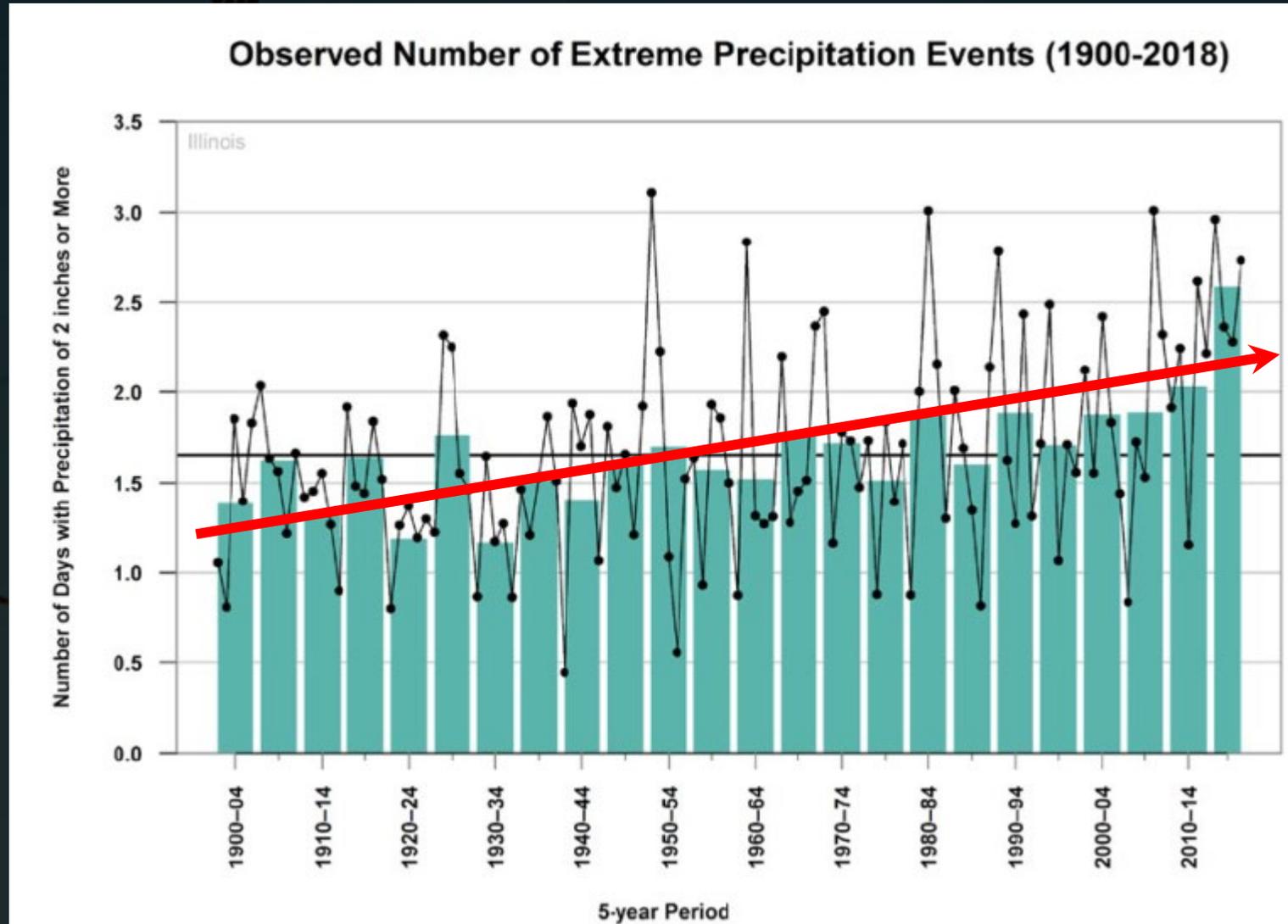


**Thanks to the
Chicago Ornithological Society,
the pilot study authors,
the dedicated volunteer team,
and Cook County FPD’s restoration
and management professionals!**

MIGRATORY BIRD FEATURE USAGE AT LABAGH WOODS

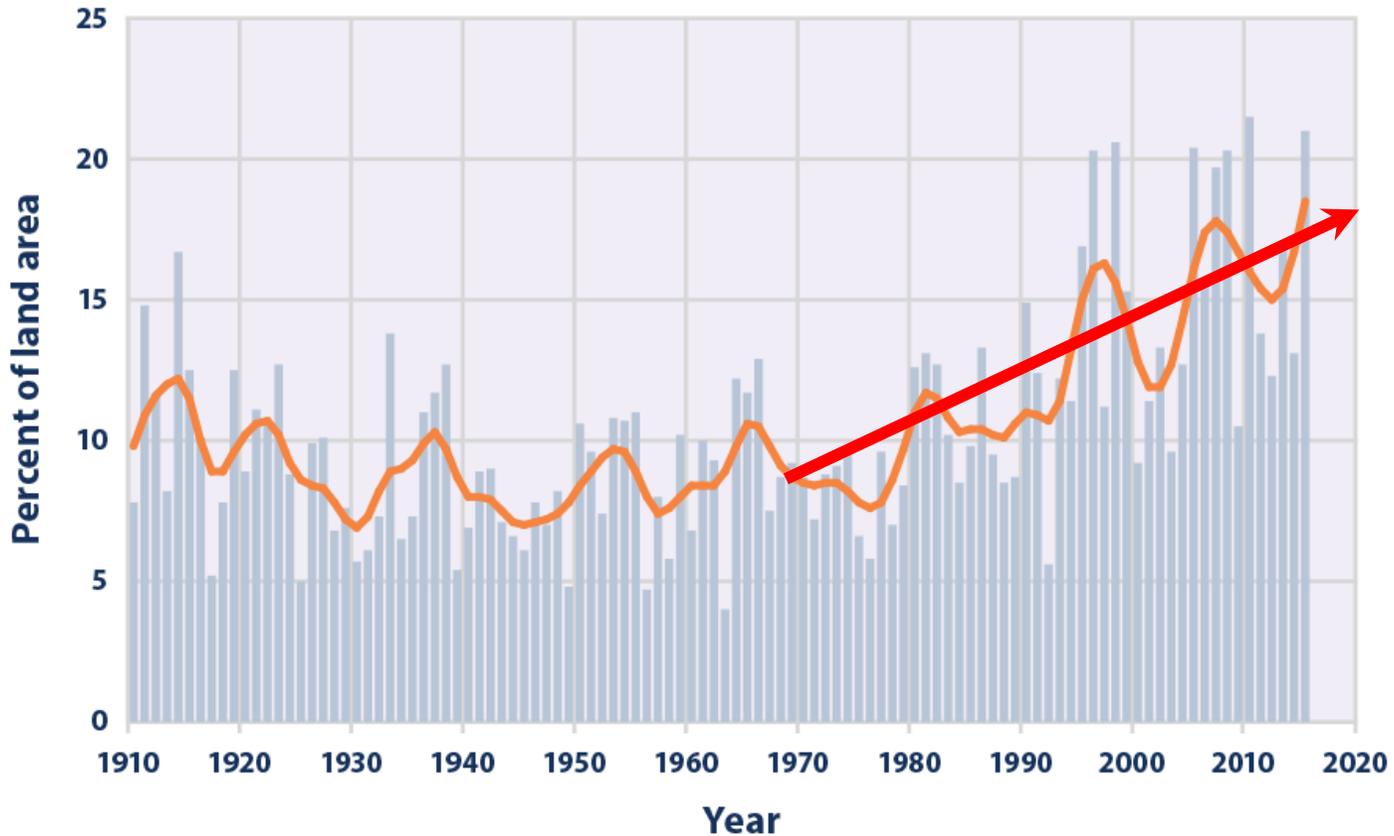


LOCAL INCREASES IN EXTREME WEATHER EVENTS



NATIONAL INCREASES IN EXTREME WEATHER EVENTS

Extreme One-Day Precipitation Events in the Contiguous 48 States, 1910–2015



Data source: NOAA (National Oceanic and Atmospheric Administration). 2016. U.S. Climate Extremes Index. Accessed January 2016. www.ncdc.noaa.gov/extremes/cei.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climate-indicators.

EXTREME WEATHER IMPACTS ON MIGRANT BIRDS

- **Forced landings and disrupted migration routes**
- **Birds along and over Lake Michigan are forced to Chicagoland shores in large numbers.**
(resulting in events like we saw at McCormick Place)
- **Increased energy consumption during high winds, rain, and cold weather**
 - **Sudden decreases in food availability**
(frozen water, absence of aerial insects, etc.)

ARTIFICIAL LIGHT IMPACTS ON MIGRANT BIRDS

“Artificial light at night is a top predictor of bird migration stopover density”

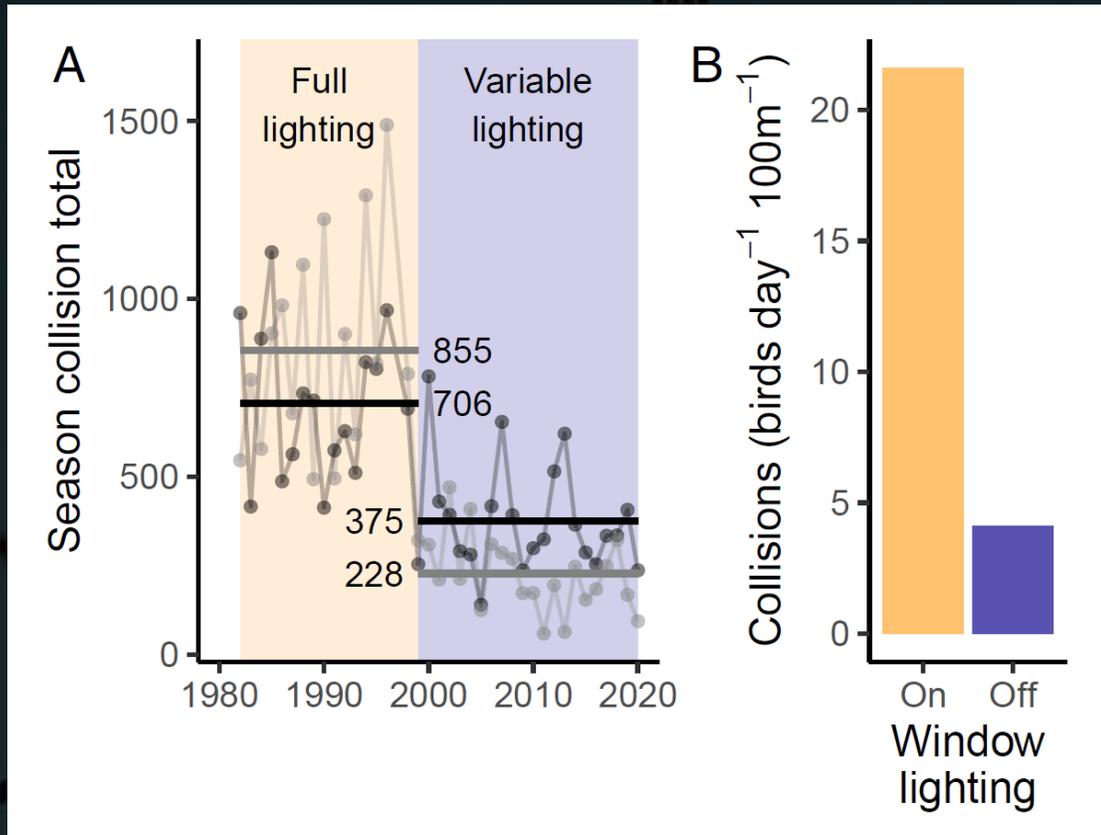
Horton, Buler, Anderson, et al.

“As billions of nocturnal avian migrants traverse North America, twice a year they must contend with landscape changes driven by natural and anthropogenic forces, including the rapid growth of the artificial glow of the night sky...we leverage over 10 million remote sensing observations to develop seasonal contiguous United States layers of bird migrant stopover density.”

“In over 70% of our models, we identify skyglow as a highly influential and consistently positive predictor of bird migration stopover density across the United States... peri-urban illuminated areas may act as ecological traps at macroscales that increase the mortality of birds during migration.”



POTENTIAL BENEFITS OF REDUCED LIGHTING



Recorded collisions by year and window lighting.

(A) Collisions recorded at McCormick Place between 1982 and 2020 for spring (light gray) and fall (dark gray) seasons before and after the window-lighting regime changed from fully lighted to partially lighted in 1999.

(B) Mean recorded daily collisions by window-lighting status

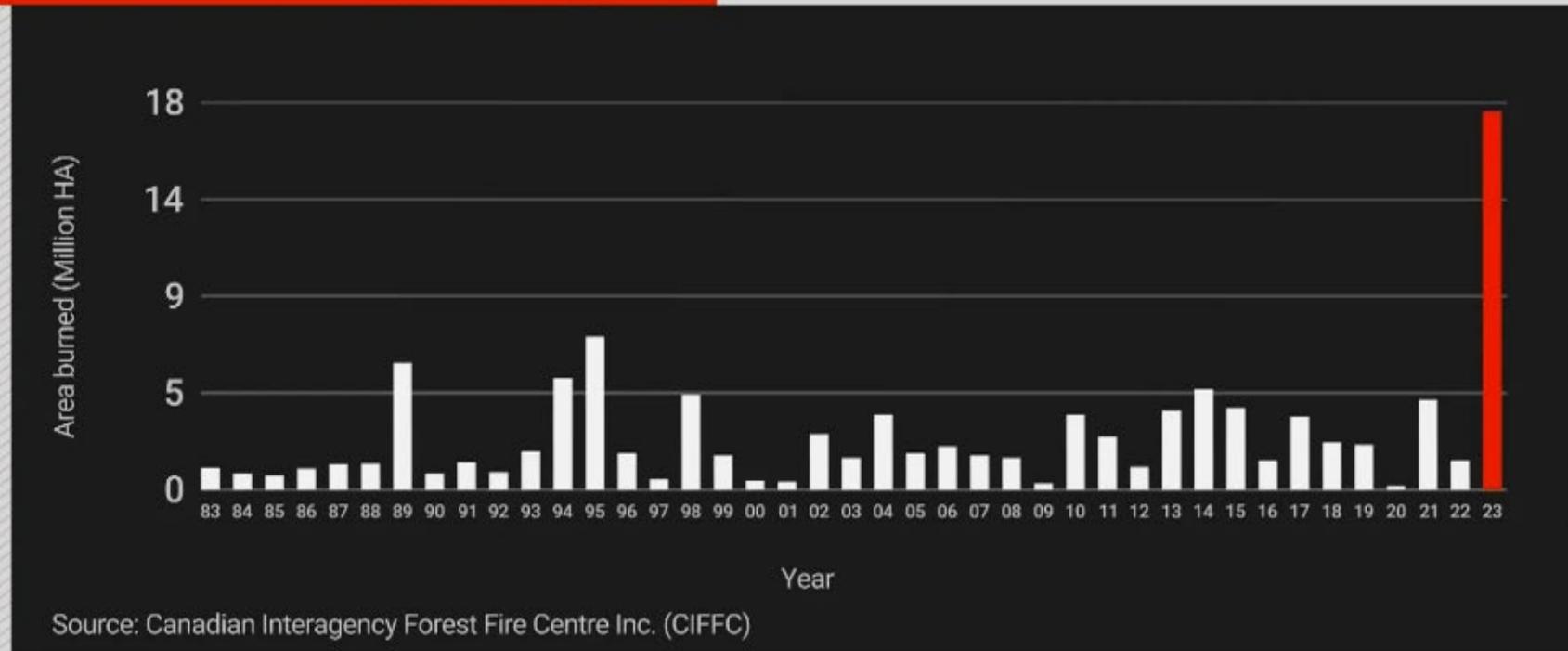
Location of McCormick Place along the Chicago lakefront.

The Lakeside Center building monitored is highlighted in red in a three-dimensional rendering

Van Doren BM, Willard DE, Hennen M, Horton KG, Stuber EF, Sheldon D, Sivakumar AH, Wang J, Farnsworth A, Winger BM. Drivers of fatal bird collisions in an urban center. Proc Natl Acad Sci U S A. 2021 Jun 15;118(24):e2101666118.

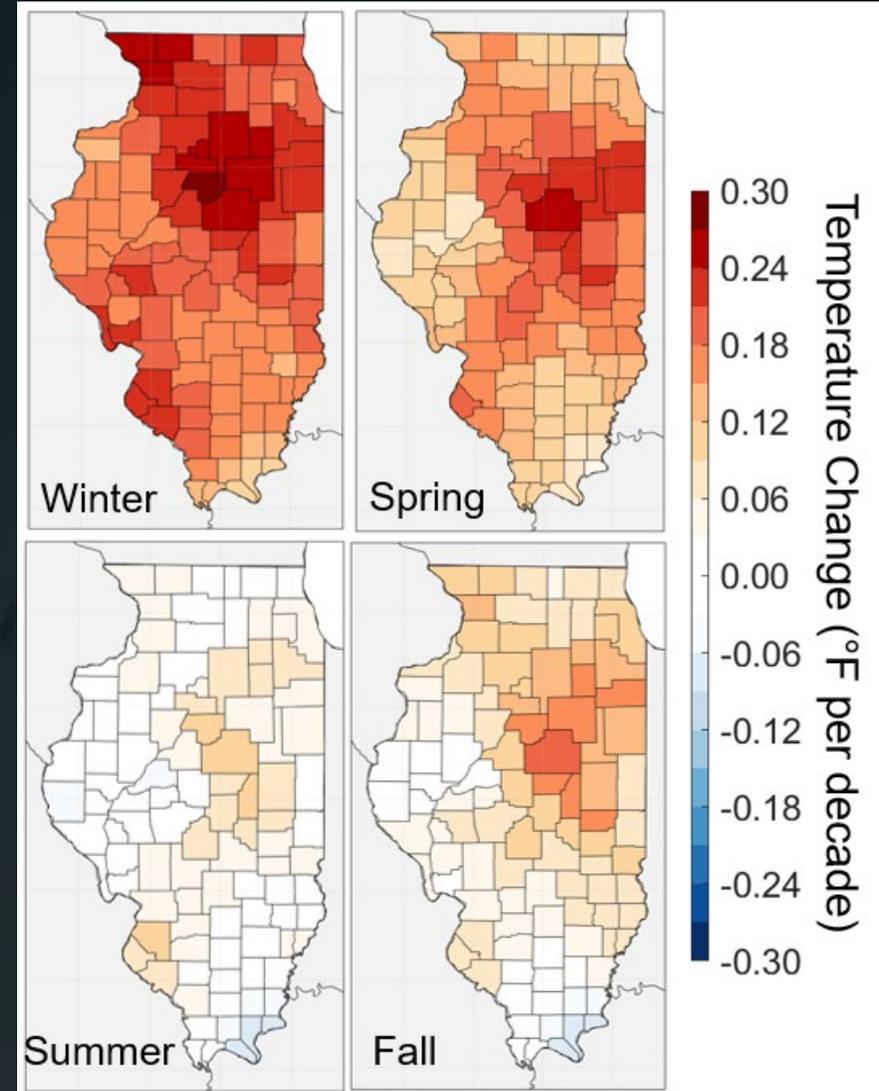
CANADA WILDFIRES

Annual Area Burned (HA)



WARMING WEATHER IN ILLINOIS

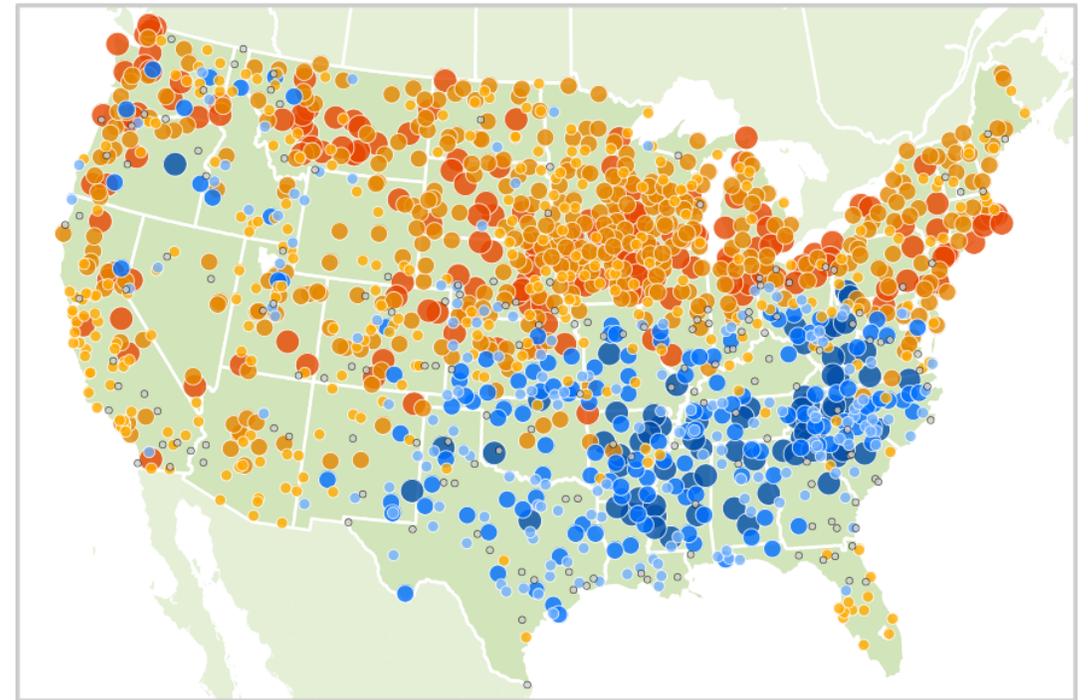
Trends in daily average temperature in degrees Fahrenheit per decade by season and county in Illinois. Trends are calculated using observations between 1900 and 2020.



CHANGE IN FIRST LEAF DATES

Even a decade ago, spring first leaf dates in Chicagoland were averaging over 8 days earlier compared to 1951-1960.

Change in First Leaf Date Between 1951–1960 and 2006–2015



Change in first leaf date:



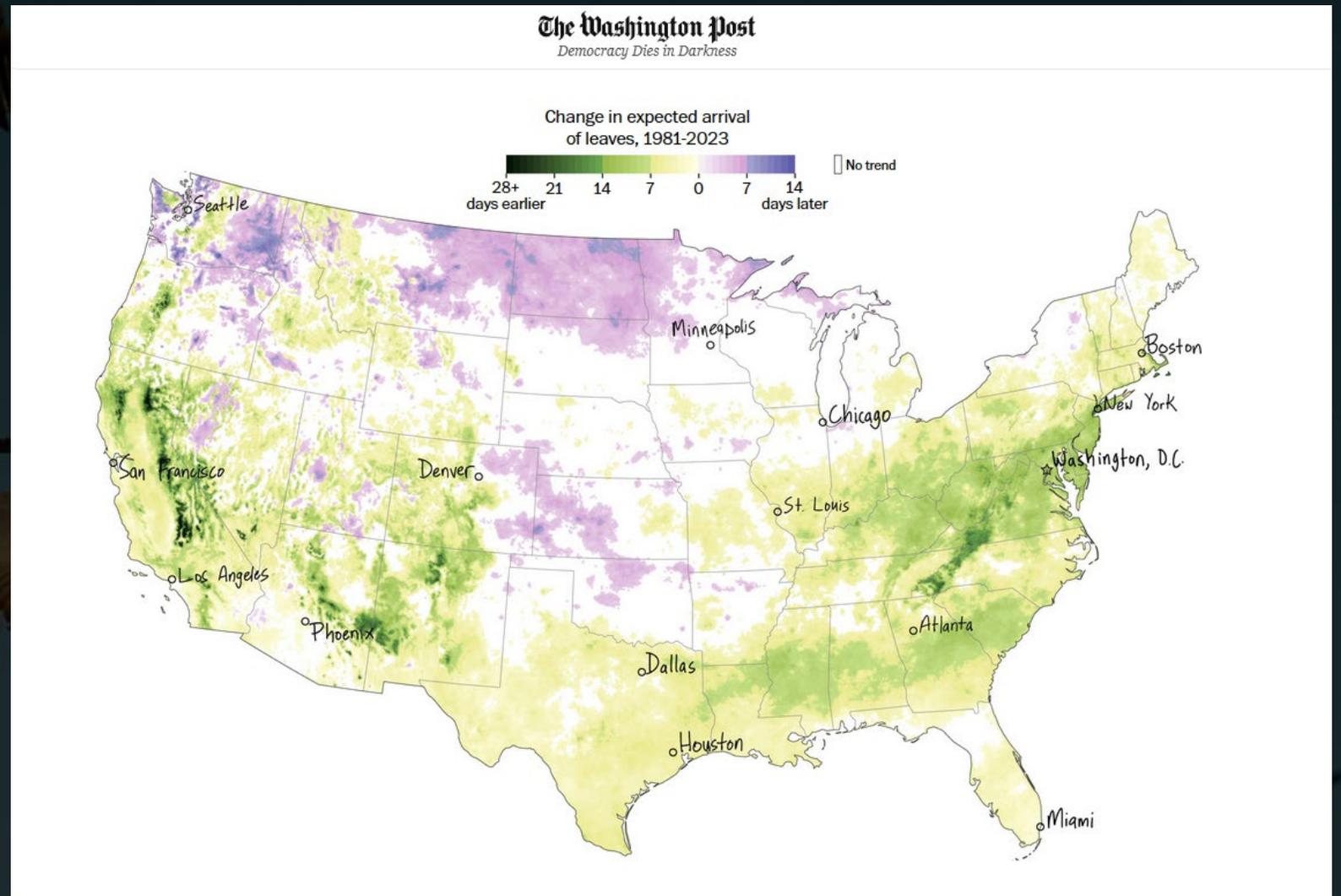
Data source: Schwartz, M.D. 2016 update to data originally published in: Schwartz, M.D., T.R. Ault, and J.L. Betancourt. 2013. Spring onset variations and trends in the continental United States: Past and regional assessment using temperature-based indices. *Int. J. Climatol.* 33:2917–2922.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climate-indicators.

See more at <https://climatechange.chicago.gov/>

CHANGE IN ARRIVAL OF LEAVES

The arrival of leaves is reportedly at least 7 days earlier since 1981 throughout most, if not all, of Illinois.

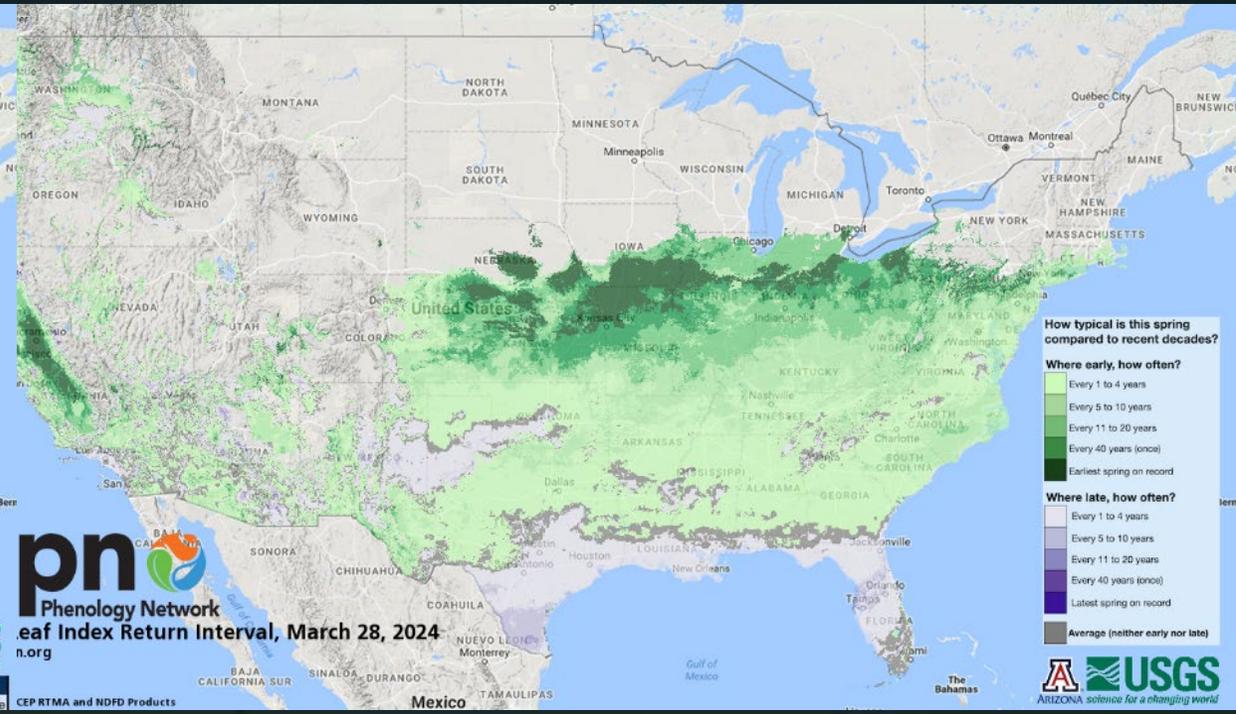
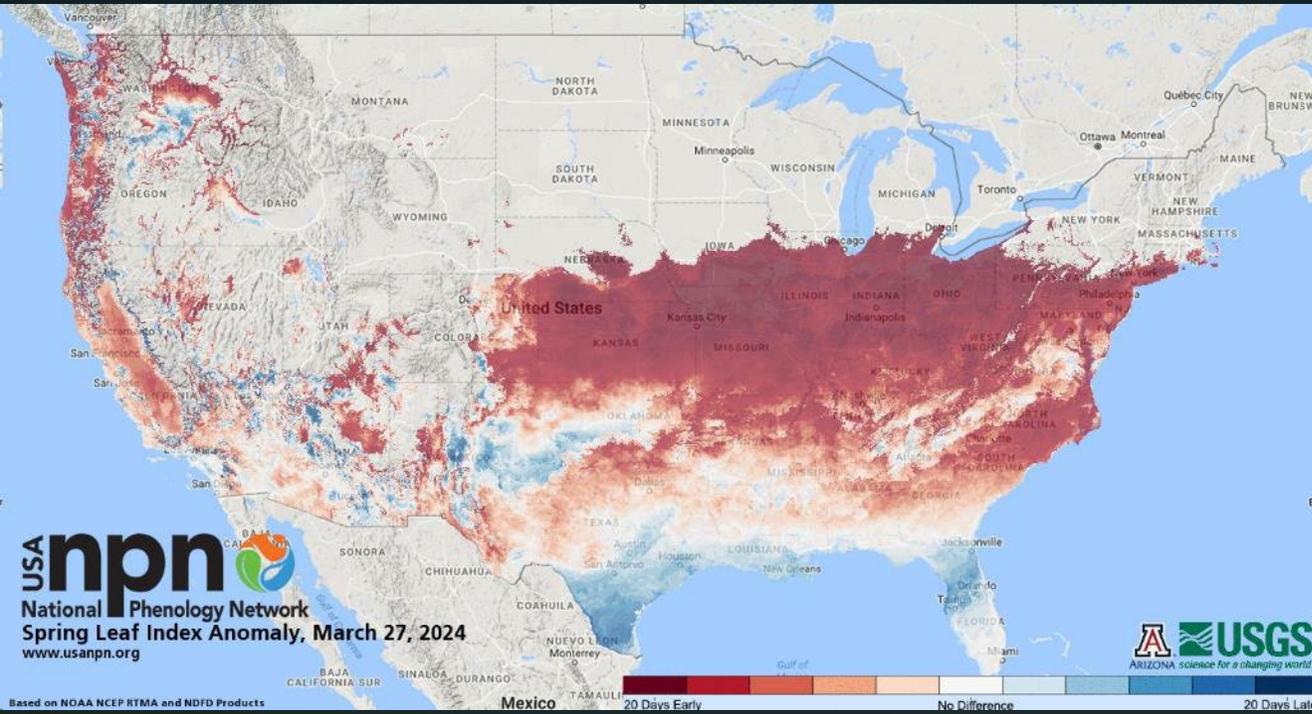


Spring is getting earlier. Find out how it's changed in your town.
Stevens, Harry. 2024. The Washington Post.
(Note: white = no trend, not zero change)

2024 SPRING LEAF INDEX

Spring Leaf Out - Days Early

How Typical is Spring 2024?



Darkest red regions = 20 days early

Dark green regions = every 40 years to record early

WARMING WINTERS AND EARLY LEAF OUT IMPACTS ON MIGRANT BIRDS

- Insect and lepidoptera abundance often coincides with warm weather and leaf out timing.
- Many birds are not yet notably adapting to changes in timing of spring leaf out and food availability.
- “Changing green-up strongly influenced phenological mismatches between the timing of bird migration and the timing of green-up, highlighting changing vegetation phenology as a potential growing threat of climate change for migratory animals” - Robertson, et. al.

BATTLING INVASIVE SPECIES

Spongy Moths

Oak Wilt

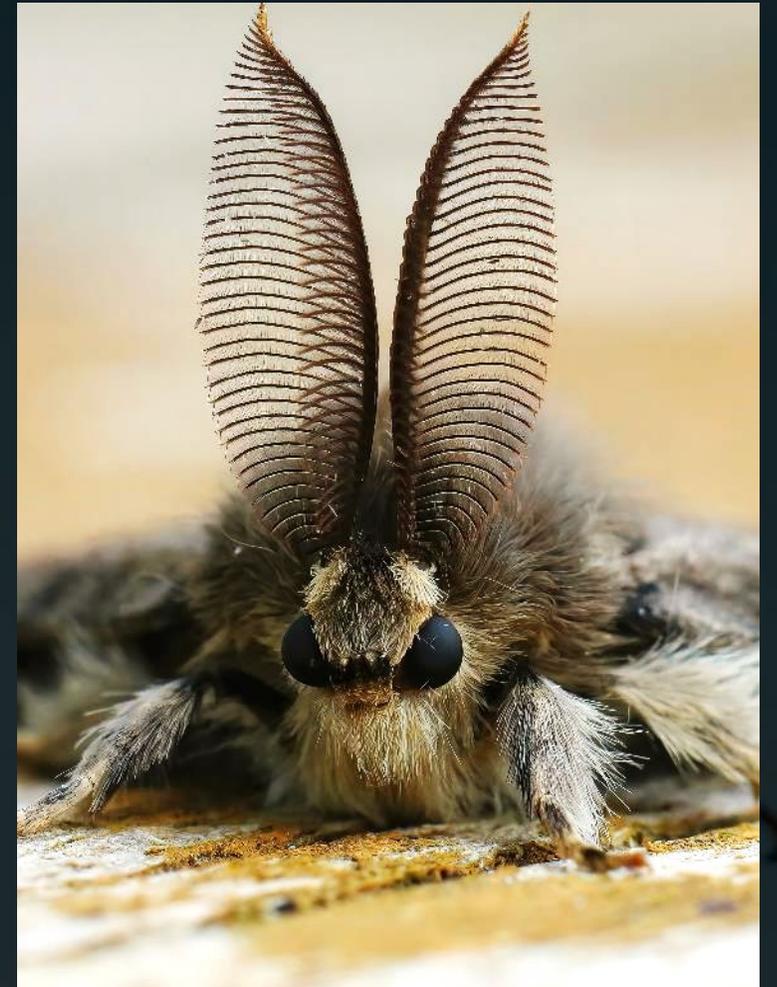
Combine these with climate change, and oaks are in trouble along with the many migrant birds.

**Emerald Ash
Borer**

**Dutch Elm
Disease**

**Spotted
Lanternfly**

Ash and Elm trees were both favored by foraging migrant birds in early May.



LAND MANAGEMENT FOR BIRDS

THE SAME GENERAL NEEDS FOR HEALTHY WOODLANDS ALSO APPLY FOR MIGRANT BIRDS

- **BUT, “The Illinois Natural History Survey estimates that at current rates of oak regeneration, their reign as the dominant species in the Illinois forest canopy could come to an end within the next 50 years.”**
 - **Migrant birds are impacted by declining tree species diversity and insect abundance.**
- **Current land management practices aren’t enough.**

LAND MANAGEMENT CHALLENGES

- **Lack of Understory Saplings and Shrubs after removal of invasives**
- **Impacts of Frequent Burns on:**
 - **Insects, Moths, & Butterflies**
 - **Oak Saplings**
- **Deer Grazing**
- **Mesophication of Woodlands**
- **Tree Crowding**



“While it is necessary to bring fire back to restore oak dominated ecosystems, the abundance of mesic species makes controlled burning more difficult and reduces intensity of fires that do occur. Therefore, many managers burn frequently, but these frequent, low intensity burns can top kill oak seedlings and prevent development of an oak sapling layer.”

Oak Ecosystems Recovery Plan

(Dey and Hartman 2005, Johnson et al. 2009)



BIRD CONSERVATIONISTS ARE SOUNDING AN ALARM CALL!

- Management and removal of understory is far outpacing regeneration, leaving many migrant birds (and some breeding species) extremely vulnerable.
- We can't rely on oaks alone.



PROTECTING MIGRANT HABITAT

URGENT BROAD ISSUES NEED TO BE TACKLED

- **Plant and maintain understory vegetation as sites are cleared of invasive species** (also prevents buckthorn re-invading).
Research ways to improve oak regeneration rates.
 - **Protect insects from clearing and burning**
(and techniques to repopulate with beneficial insects?)
- **Maintaining/enhancing tree species health and diversity**
(amid threats of invasive species and climate change)
- **Protect and enhance habitat along CW Region waterways**
(along rivers, inland lakes, Lake Michigan, wetlands, ephemeral ponds)

PROTECTING MIGRANT HABITAT

- Restoring Successional Habitat along Forest Edges
- Addressing the Extreme Lack of Shrubland Habitat
- Prioritizing Management for Migrant Birds at Key Sites



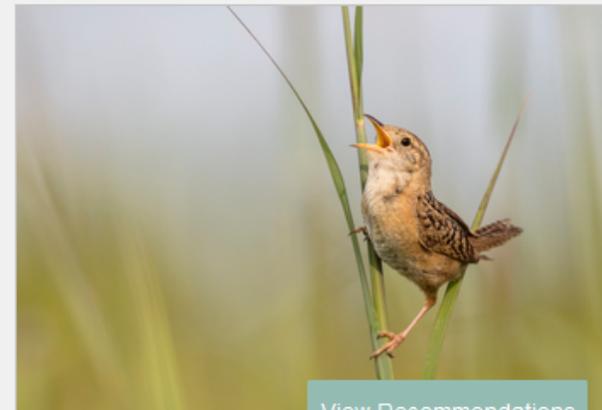
ILLINOIS COASTAL STOPOVER TOOL

AUDUBON GREAT LAKES

- See the Illinois Coastal Stopover Tool and click on “Management” for a summary of recommendations at different scales of habitat preservation and management.
- <https://gl.audubon.org/landingmigratory-stopover-habitat/illinois-coastal-stopover-tool>

Management Resources

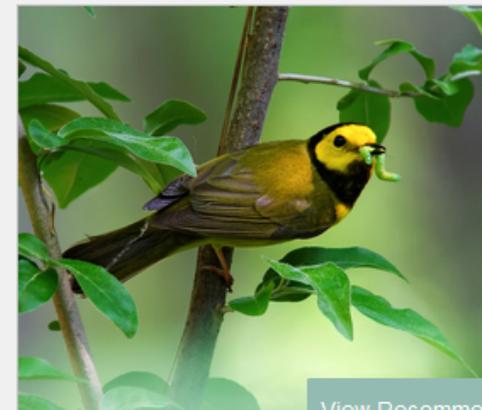
Explore resources and recommendations for land managers at the landscape scale (woodland, grassland and shrubland) within the Illinois Coastal Region.

[View Recommendations](#)

Landscape Management

High level overview of large-scale stopover management recommendations

Sedge Wren. Photo: Kathryn Cubert/Audubon Photography Awards

[View Recommendations](#)

Local Scale Management

Important considerations, tradeoffs, and information for local scale management

Hooded Warbler. Photo: Megumi Williamson/Audubon Photography Awards

PRIORITY SITES FOR MIGRANT BIRDS



**Diverse
Tree Species**

**Dense
Understory**

Near Water
(esp. waterways)

**Flatlands &
Bottomlands**

**Oak Woodlands &
Savannas**

**Wooded
Shrublands**

Near Lake Michigan

Edge Habitats

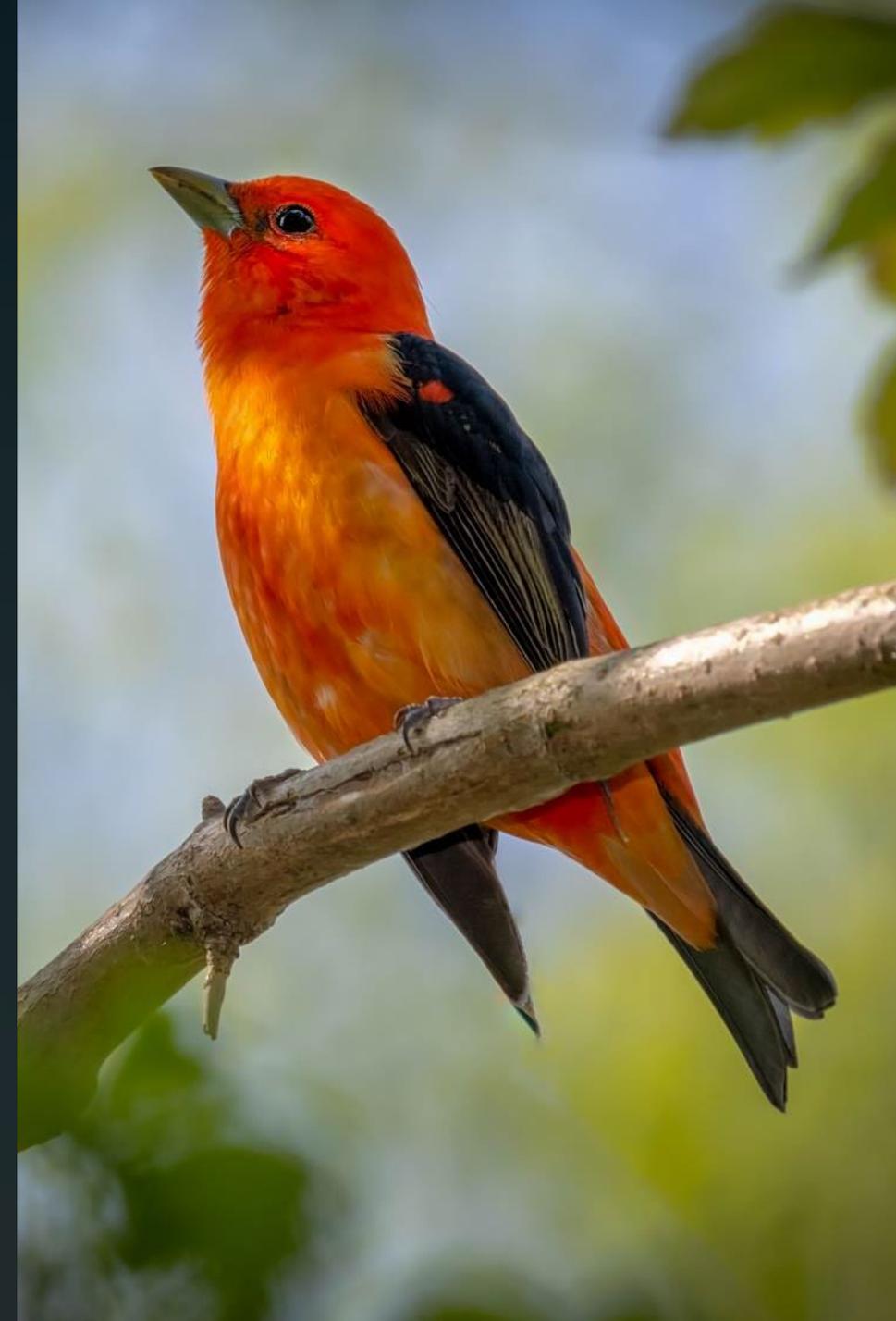
Small Sites

**Islands &
"First Stops"**

Greenways

ONGOING RESEARCH QUESTIONS

- Impacts of buckthorn removal & burning on insects, fungi, & soil
- Impacts of herbicides on insects & soil
- Optimum tree canopy cover for oaks and migrant birds
- When to retain cherry trees, willows, other trees, and vines
- Varying flattened and tilled terrain
- Impacts of mosquito control on birds



WE'RE WORKING TOGETHER IN THE CW REGION

The CRTI Oak Ecosystem Recovery Plan

(maintain and expand oak woodlands and savannas and the insect larvae they support).

Hackmatack NWR – nearly 1,000 acres added (Tamarack Farms)

(largest regional conservation acquisition in 28 years thanks to the Conservation Fund, Illinois Audubon, and Openlands)

Illinois Beach State Park – protecting undeveloped beaches from shoreline erosion

Two IDNR projects to combat Lake Michigan wave action.

Midewin – continued restoration of globally-rare habitat

Openlands, the Wetlands Initiative, and the U.S. Forest Service collaboration.

Land managers are collaborating to employ BMP's for restoration, removal of invasives, etc.

THE POWER OF COMMUNITY

OUR VOICES CAN MAKE WAVES OF CHANGE!

- **Advocate for much more funding for land management, shrub planting (and maintenance!), and land preservation**
 - **Advocate for bird-friendly policies in your community and employ them at home:**
 - **Reducing Light Pollution** (Lights Out, helping nocturnal migrants)
 - **Bird-friendly Glass & Building Design** (reducing bird collisions)
 - **Landscape for Birds** (beneficial even in small city lots)
 - **Control Use of Toxics** (pesticides, rodenticides, herbicides)
 - **Cats Indoors**

CAN WE DO MORE TO PROTECT OUR MIGRATORY BIRDS?

The answer:
An emphatic YES!



THANK YOU!

BIRD CONSERVATION NETWORK

PROMOTING BIRD CONSERVATION IN CHICAGOLAND FOR OVER 20 YEARS

We are a coalition of 21 conservation organizations with an interest in the preservation of birds and the habitats they need to survive.

We advocate for bird-friendly policy change and are a resource for researchers, land managers, and conservation partners in the Chicago Wilderness.



www.bcnbirds.org