

State of the Grasslands Report

Chicago Wilderness

2018



PHOTO: Ruhikanta Meetei/
Audubon Photography Awards



EASTERN MEADOWLARK.
PHOTO: PHIL HAUCK (CC BY-NC-ND)



Written by

Daniel Suarez and Stephanie Beilke of Audubon Great Lakes and Jim Herkert of Illinois Audubon Society.

Recommended Citation

Suarez, D., Beilke, S., and Herkert, J. 2018. State of the Grasslands: Chicago Wilderness – 2018.
National Audubon Society and Illinois Audubon Society.

This publication was made possible by funding from Grand Victoria Foundation.

The Chicago Wilderness Grassland Bird Task Force

The Bird Conservation Network, Illinois Audubon Society, Forest Preserves of Cook County, Lake County Forest Preserves, McHenry County Conservation District, Forest Preserve District of DuPage County, Forest Preserve District of Kane County, Forest Preserve District of Will County, Forest Preserve District of Kendall County, Field Museum of Natural History, Illinois Department of Natural Resources, Illinois Natural History Survey, The Nature Conservancy, U.S. Geological Survey, U.S. Fish & Wildlife Service, University of Wisconsin, and hundreds of volunteer stewards and bird monitors across the Chicago Wilderness Region.

Audubon's grassland conservation work in the Chicago Wilderness region is supported by
the Bobolink Foundation, the Forest Preserves of Cook County, the Gaylord and Dorothy Donnelley Foundation, Grand Victoria Foundation, and Lake County Forest Preserves.



GAYLORD & DOROTHY
DONNELLEY FOUNDATION



TABLE OF CONTENTS

| | |
|---|----|
| Foreword..... | 1 |
| What is a Grassland?..... | 2 |
| Chicago Wilderness Grassland Birds of Concern..... | 2 |
| Working Lands for Birds and People | 8 |
| Grassland Bird Modeling in Chicago Wilderness | 9 |
| Land Management Data Collection and Discussion..... | 10 |
| Climate Change..... | 15 |
| References | 16 |



VOLUNTEERS REMOVING INVASIVE SPECIES FROM A
RESTORED WARM-SEASON GRASSLAND AT SPRING
CREEK FOREST PRESERVE, COOK COUNTY
PHOTO: JIM ROOT

FOREWORD

The grasslands of the Chicago Wilderness (CW) region are a testament to the stunning diversity of life. From the wide range of plant species supported by rare intact soil biota of remnant prairies, to the insects, birds, amphibians, and mammals that live in this habitat, our grasslands are priceless refuges for multitudes of living things.

But the current state of Illinois prairies raises alarms. Despite its nickname, the “Prairie State” now has less than 0.01% of its pre-European settlement prairie, totaling fewer than 2,000 remnant acres (White 1978). In most cases, these small fragments—usually an acre or smaller—exist within tiny railroad rights-of-way or cemetery prairies, and do not provide enough habitat to sustain grassland birds, let alone fully function as grassland ecosystems. The substantial loss of our native grasslands is a major factor in precipitous declines of several iconic grassland bird species statewide.

Yet despite this tremendous loss, there is reason for optimism. Over the last 40 years, conservationists, including restoration staff, volunteers, interns, and contractors, have worked to restore degraded grasslands, such as those in the Hackmatack National Wildlife Refuge, to protect existing grasslands at Midewin National Tallgrass Prairie, and to create new grasslands in defunct agricultural areas. County forest preserve districts are now exploring ways to establish large, unbroken grassland expanses, and in 2017, six Chicago metropolitan counties actively managed a total of 58,584 out of 63,485 total grassland acres.

This is all good news for birds. Conservation and science-informed grassland management has been a major factor in halting and reversing population declines of grassland birds. The Henslow’s Sparrow’s dramatic 50-year decline, for instance, has stabilized over the past 20 years in the CW region. And Bobolinks, which continue to suffer an average annual population decline of almost 7% in the Midwest, are now stable and perhaps even slightly increasing in this area (Bird Conservation Network, 2013).

As we learn more and more about the benefits healthy grasslands deliver to people and communities—including carbon sequestration, pollinator services, water quality and infiltration, and flood abatement—we have an unprecedented opportunity to build public support for grassland conservation. By communicating these “ecosystem services” resulting from healthy grasslands, we can build a larger and more diverse advocacy network than ever for grassland conservation.

The Chicago Wilderness Grassland Bird Task Force

This report was produced by the Chicago Wilderness Grassland Bird Task Force. Convened by Audubon Great Lakes in 2013, it is composed of six county land owners and other non-governmental organizations, including the Field Museum, Illinois Audubon Society, and Illinois Natural History Survey, all working to develop a regional strategy for grassland bird conservation. We are synthesizing grassland bird population data and habitat management data across the seven-county region to assess the state of CW grasslands and determine the most effective conservation and land-management strategies. We seek to expand grassland protection and restoration efforts throughout the region, to connect habitats in order to minimize the effects of habitat fragmentation, and to inspire a new generation of scientists, stewards, and grassland advocates.

WHAT IS A GRASSLAND?

Grassland biomes exist across the planet, with large concentrations in the central United States, southeastern South America, and Eurasia. All grasslands are dominated by grasses, sedges, and rushes; CW prairies also contain a diverse array of forbs, or flowering herbaceous plants. Grasslands are among the world's most threatened ecosystems, with agricultural development being the main driver of their decline.

Throughout this report, we refer to “cool-season” and “warm-season” grasslands. Cool-season grasslands are dominated by non-native grasses, such as brome and fescue, and are often utilized by farmers for livestock and hay. In other cases, cool-season grasses, which require only annual or biannual mowing or haying to maintain their structure, were planted as a way of providing low-maintenance habitat for grassland birds. Warm-season grasslands are prairie remnants and restorations. Prairie remnants are grasslands that were never plowed and tilled for economic benefit, and they retain many of the soil biota that have accumulated over millennia. Prairie restorations—often former farmland or pasture—have undergone a concerted effort to reintroduce native plant species.



CHICAGO WILDERNESS GRASSLAND BIRDS OF CONCERN

At least eight grassland obligate bird species have been identified as regularly breeding within the CW region. Of these species, three have been classified as Illinois Species in Greatest Need of Conservation: Bobolink, Henslow's Sparrow, and Sedge Wren (IL DNR, 2015); and four have been classified as Species of Continental Importance within Bird Conservation 22: Eastern Tallgrass Prairie: Bobolink, Eastern Meadowlark, Grasshopper Sparrow, and Henslow's Sparrow, according to the latest conservation plan by Partners in Flight (Rosenberg et al., 2016).

The following profiles cover the preferred grassland habitat, population status, and top threats to five grassland obligate species.

BOBOLINK (*Dolichonyx oryzivorus*)

Bobolinks are long-distance migrants that spend winters in the grasslands of Argentina, Uruguay, and Brazil. During the summer breeding season, they are widespread across northern North America (Figure 1). In the CW region, this species usually prefers mid-level vegetation height (Figure 2) and cool-season grasslands (Figure 3), especially those being utilized as pasture or hayfields, but several breed at select warm-season prairie restoration locations, such as Poplar Creek Forest Preserve in Cook County and Rollins Savanna in Lake County. Threats to Bobolinks include pesticide use and habitat degradation in breeding and wintering grounds (Renfrew, et al., 2015). Over the past 50 years, Bobolink populations have declined in Illinois an average of 6.76% per year; from 2005 and 2015, the decline was 10.35% (Sauer et al., 2017).

Bobolinks were once widespread in the agricultural landscape of the CW region, but now they are largely restricted to protected grasslands. Trends at Midewin National Tallgrass Prairie from 1985-2015 show that Bobolink populations are stable and indicate a high likelihood of long-term persistence (>95% over 100 years) if current habitat conditions continue (J. Herkert, 2016 pers. comm.).

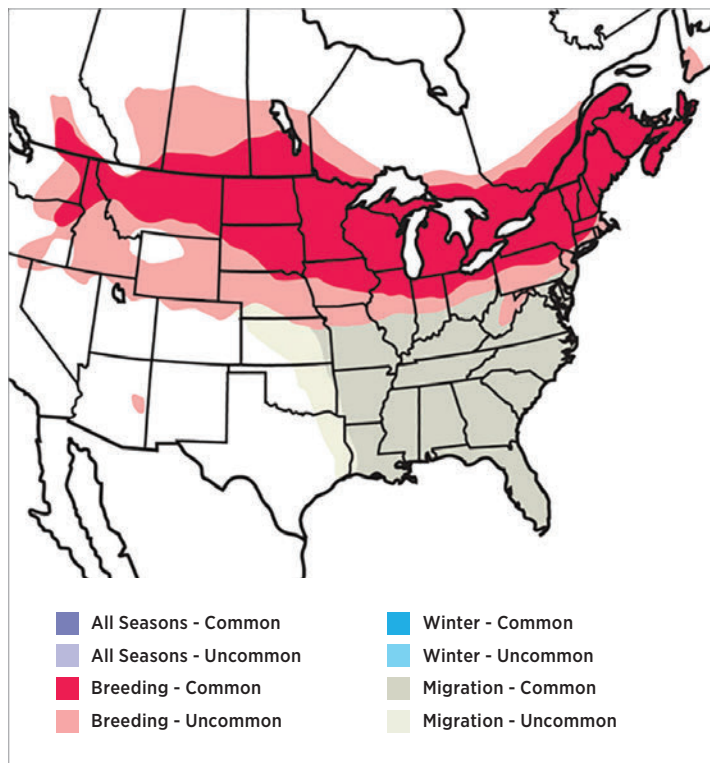


Figure 1. Bobolink breeding and migratory range in North America.
Map Credit: Kenn Kaufman



SPECIES: Bobolink (*Dolichonyx oryzivorus*)

CONSERVATION STATUS:

Species in Greatest Need of Conservation (IL)

BBS TREND IL 1966-2015: -6.76%

[Confidence Interval: -8.16, -5.27]

BCN TREND 1999-2012: 2% (±1%)

HABITAT PREFERENCES:

Cool-season, moist grasslands, area sensitive

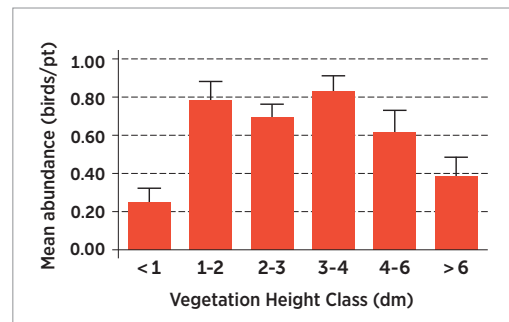


Figure 2. Mean abundance of Bobolinks per point count (n=2,291 surveys) within various vegetation height classes within the Chicago Wilderness region between 1995-2015 (Herkert, 2015).

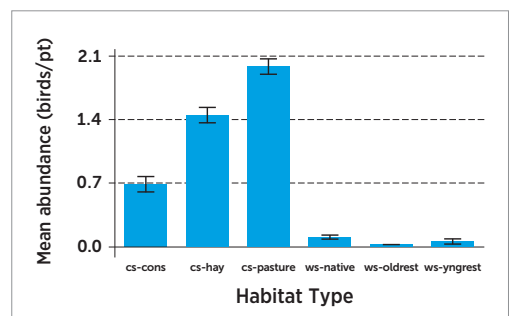


Figure 3. Mean abundance of Bobolinks per point count (n=2,291 surveys) within various habitat types within Chicago Wilderness region between 1995-2015 (Herkert, 2015).

Cs-cons: cool season conservation lands

Cs-hay: cool season hay fields

Cs-pasture: cool season pasture

Ws-native: warm season native restoration

Ws-oldrest: warm season old restoration (>10 years)

Ws-yngrest: warm season young restoration (<10 years)

EASTERN MEADOWLARK (*Sturnella magna*)

Eastern Meadowlarks are short-distance migrants, spending their winters in the southeastern United States and Mexico. During the breeding season, Eastern Meadowlarks are widespread throughout eastern United States, Mexico and southeastern Canada (Figure 4) and use grasslands with a variety of vegetation heights (Figure 5). While they prefer cool-season grasslands utilized as pasture or hayfields, they also successfully breed in warm-season prairie remnants and prairie restorations (Figure 6). This species is experiencing a 3% decline in Illinois, according to the Breeding Bird Survey data (Sauer et al., 2017). Like other grassland birds, Eastern Meadowlarks are threatened by agricultural practices that negatively impact breeding, such as early mowing and pesticide use (Jaster, et al., 2012).

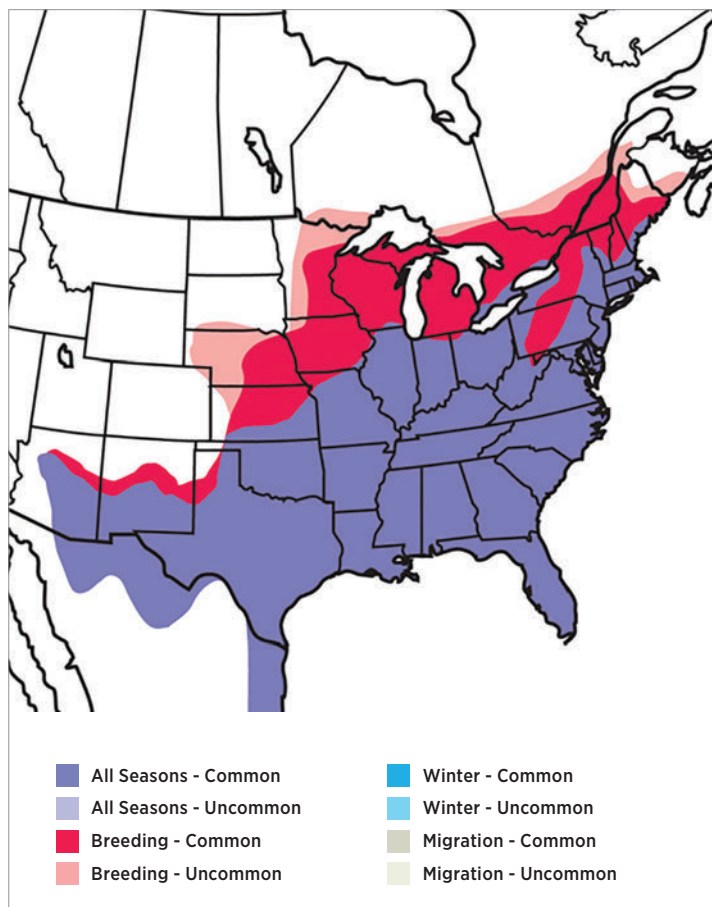


Figure 4. Eastern Meadowlark breeding and winter range in North America. Map Credit: Kenn Kaufman

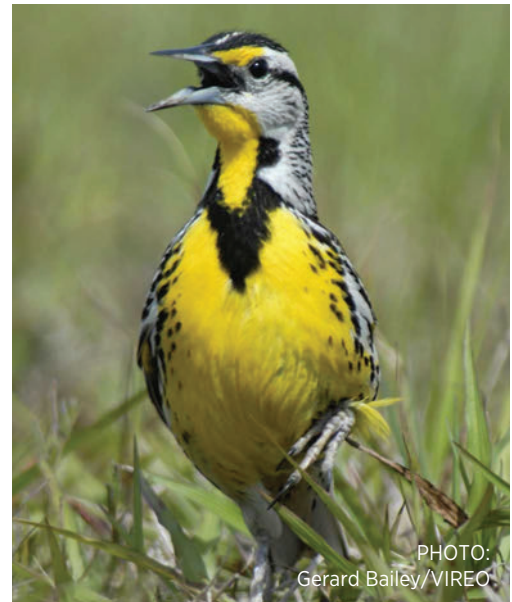


PHOTO:
Gerard Bailey/VIREO

SPECIES:

Eastern Meadowlark (*Sturnella magna*)

CONSERVATION STATUS:

Species of Continental Importance (PIF)

BBS TREND IL 1966-2015: -3%

[Confidence Interval: -3.58, -2.42]

BCN TREND 1999-2012: -4% ($\pm 1\%$)

HABITAT PREFERENCES: Generalist

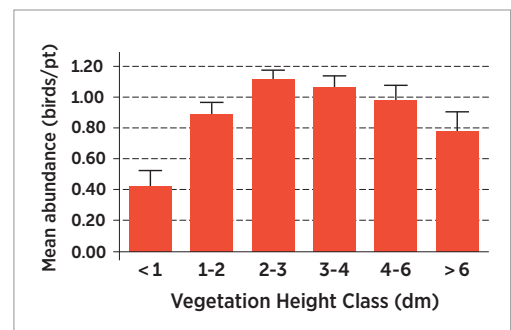


Figure 5. Mean abundance of Eastern Meadowlarks per point count (n=2,198 surveys) within various vegetation height classes within the Chicago Wilderness region between 1995-2015 (Herkert, 2015).

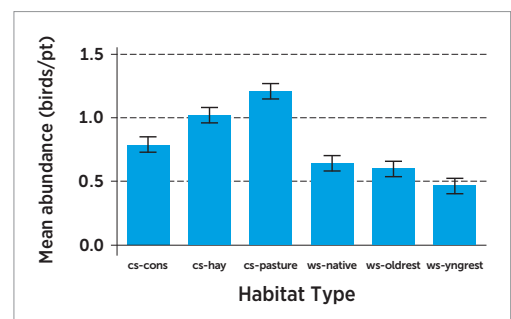


Figure 6. Mean abundance of Eastern Meadowlarks per point count (n=2,198 surveys) within various habitat types within Chicago Wilderness region between 1995-2015 (Herkert, 2015). See Figure 3. for habitat type definitions.

GRASSHOPPER SPARROW (*Ammodramus savannarum*)

Grasshopper Sparrows spend the winter in southeastern United States and Mexico. The core of their summer breeding range stretches across central North America (Figure 7) and they show preference for shorter vegetation (Figure 8) and cool-season grasslands (Figure 9). According to Breeding Bird Survey trend data, Grasshopper Sparrow populations have been declining by 6.54% in Illinois since 1966 (Sauer et al., 2017). Grasshopper Sparrow breeding success can be threatened by early-season mowing on agricultural lands (Bollinger et al., 1990).

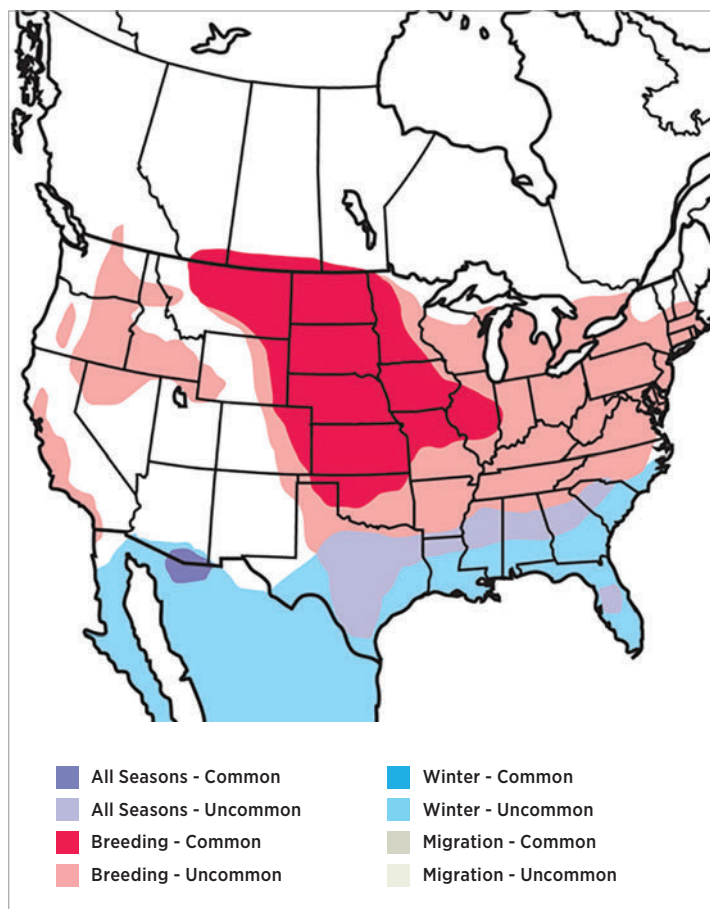


Figure 7. Grasshopper Sparrow breeding, migratory and winter range in North America. Map Credit: Kenn Kaufman



PHOTO:
Rick and Nora
Bowers/VIREO

SPECIES: Grasshopper Sparrow
(*Ammodramus savannarum*)

CONSERVATION STATUS:
Species of Continental Importance (PIF)

BBS TREND IL 1966-2015: -6.54%
[Confidence Interval: -7.65, -5.47]

BCN TREND 1999-2012: -6% ($\pm 2\%$)

HABITAT PREFERENCES:
Dry short grasses, area sensitive

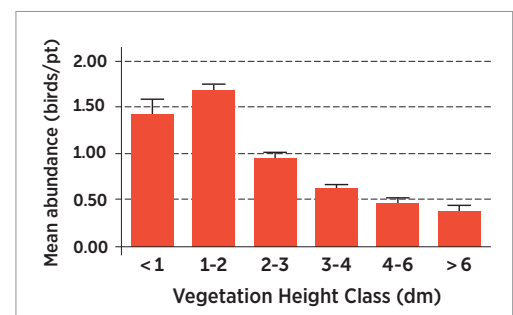


Figure 8. Mean abundance of Grasshopper Sparrows per point count (n=2,198 surveys) within various vegetation height classes within the Chicago Wilderness region between 1995-2015 (Herkert, 2015).

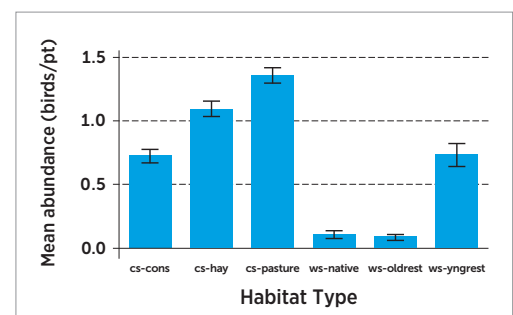


Figure 9. Mean abundance of Grasshopper Sparrows per point count (n=2,198 surveys) within various habitat types within Chicago Wilderness region between 1995-2015 (Herkert, 2015). See Figure 3. for habitat type definitions.

HENSLOW'S SPARROW (*Ammodramus henslowii*)

Unlike those of most other grassland bird species in Illinois, state populations of the Henslow's Sparrow are on an upward trend—4.78% over the past 50 years (Sauer et al., 2017). Bird Conservation Network data (BCN, 2013) also confirm that the Henslow's Sparrow is locally increasing by about 5% annually (Figure 10).

Henslow's Sparrows spend their winter exclusively in the southeastern United States and breed in the Midwest (Figure 11). Henslow's Sparrows tend to favor taller vegetation (Figure 12) that has not been recently burned, since they require a dense layer of dead thatch accumulated over previous growing seasons—a key factor land managers must take into account regarding prescribed burning. While prescribed burning is often done to prevent brush encroachment and to enhance restored plant communities, it can be temporarily detrimental to the Henslow's Sparrow. Henslow's Sparrows are unique in that they are almost as likely to breed in cool-season grasslands as warm-season grasslands (Figure 13).

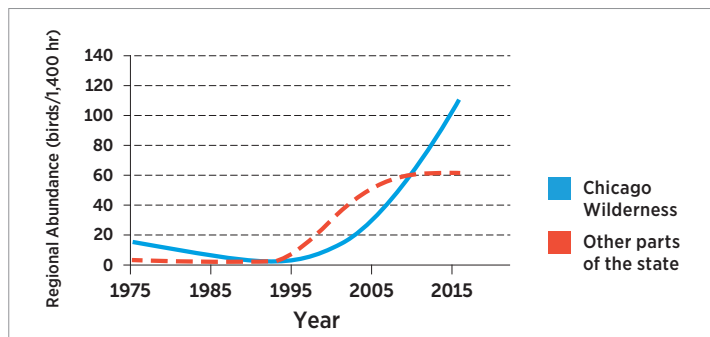


Figure 10. Henslow's Sparrow Spring Bird Count Population Trends in the Chicago Wilderness Region.

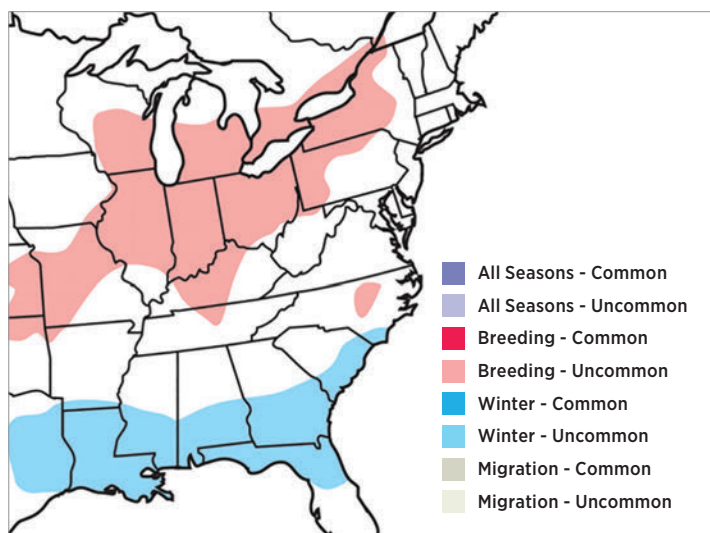


Figure 11. Henslow's Sparrow breeding and winter range in North America. Map Credit: Kenn Kaufman



PHOTO:
Brian E. Small/VIREO

SPECIES: Henslow's Sparrow
(*Ammodramus henslowii*)

CONSERVATION STATUS:

Species in Greatest Need of Conservation (IL);
Species of Continental Importance (PIF)

BBS TREND IL 1966-2015: 4.78%

[Confidence Interval: 0.29, 9.88]

BCN TREND 1999-2012: 5% ($\pm 2\%$)

HABITAT PREFERENCES:

Tall grass, area sensitive

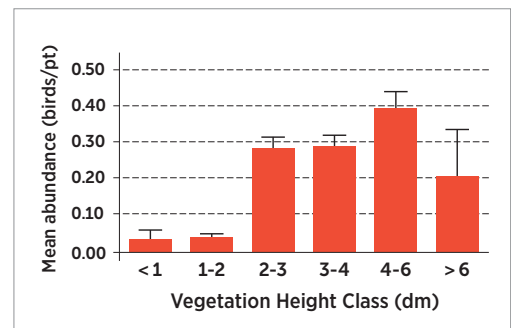


Figure 12. Mean abundance of Henslow's Sparrows per point count (n=2,198 surveys) within various vegetation height classes within the Chicago Wilderness region between 1995-2015 (Herkert, 2015).

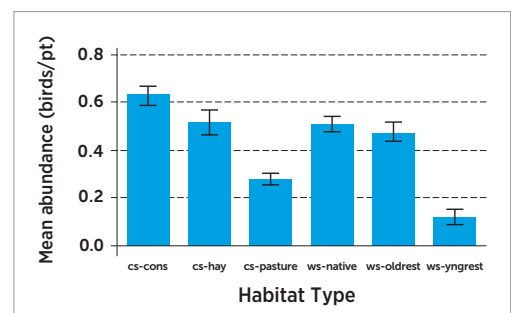


Figure 13. Mean abundance of Henslow's Sparrows per point count (n=2,198 surveys) within various habitat types within Chicago Wilderness region between 1995-2015 (Herkert, 2015). See Figure 3. for habitat type definitions.

Although Henslow's Sparrow populations are doing relatively well in the Chicago region, long-term threats do exist, including habitat loss as a result of agricultural activities and pesticide use (Herkert et al., 2002).

SEDGE WREN (*Cistothorus platensis*)

Sedge Wrens spend winter in the southeastern United States and Mexico and breed in the upper Midwest and southern Canada (Figure 14). They prefer tall vegetation (Figure 15) in wet prairies, but draining of wetlands is a leading threat to their breeding habitat. This species also appears to respond negatively to mowing, grazing and burning activities, which reduce vegetation density (Herkert et al., 2001). Sedge Wrens appear to be declining in the Chicago Wilderness region (BCN, 2013) though not enough data exists to confirm statewide population trends.

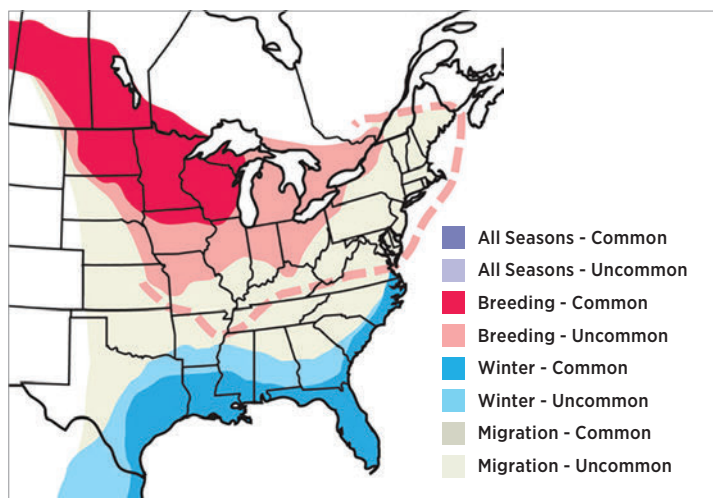


Figure 14. Sedge Wren breeding, migratory and winter range in North America. Map Credit: Kenn Kaufman



PHOTO:
Glenn Bartley/VIREO

SPECIES: Sedge Wren (*Cistothorus platensis*)

CONSERVATION STATUS:

Species in Greatest Need of Conservation (IL)

BBS TREND IL 1966-2015: -0.96%

[Confidence Interval: -5.64, 3.57]

BCN TREND 1999-2012: -5% ($\pm 3\%$)

HABITAT PREFERENCES: Wet, tall grass

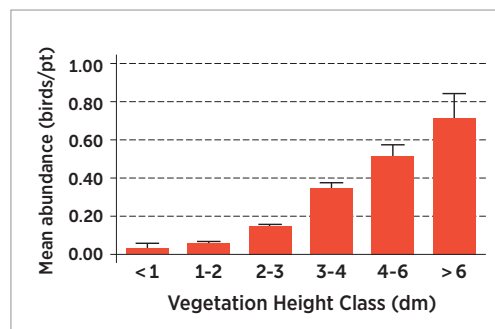
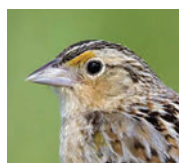


Figure 15. Mean abundance of Sedge Wrens per point count (n=2,291 surveys) within various vegetation height classes within the Chicago Wilderness region between 1995-2015 (Herkert, 2015).

FIVE OBLIGATE GRASSLAND SPECIES



GRASSHOPPER SPARROW

Dry, short grass,
area sensitive



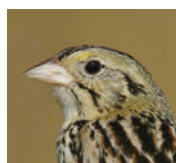
EASTERN MEADOWLARK

Generalist



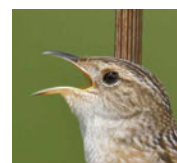
BOBOLINK

Mesic,
area sensitive



HENSLOW'S SPARROW

High grass,
area sensitive



SEDGE WREN

Wet, tall grass



Figure 16



PHOTO: [HTTPS://COMMONS.WIKIMEDIA.ORG/WIKI/FILE:IOWA_HAY_FIELD_HARVEST.JPG](https://commons.wikimedia.org/wiki/File:IOWA_HAY_FIELD_HARVEST.JPG)

WORKING LANDS FOR BIRDS AND PEOPLE

Hay fields and non-native grasslands can provide quality habitat for grassland breeding birds in the Midwest. They can also create ecological traps, where birds establish territories and nests but fail to successfully fledge chicks before the hay harvest. Thanks to a tremendous amount of data on the phenology of grassland birds in the CW region, we have a solid understanding of their nesting cycles and, therefore, we know how to time haying and mowing operations to optimize bird productivity.

The nesting period for focal species in the CW region extends from early May to early August (Figure 17). Nest activity is highest from roughly the second week of June to the first week of July—peaking on June 22, when 35% of all grassland bird nests are active. Therefore, haying and mowing conducted on that day potentially impacts the highest number of birds. Such operations conducted on July 15 will potentially impact 20%; and conducted on the first of August, 5%.

In order to protect the highest number of grassland birds, haying and mowing should be avoided between late April and mid-August.

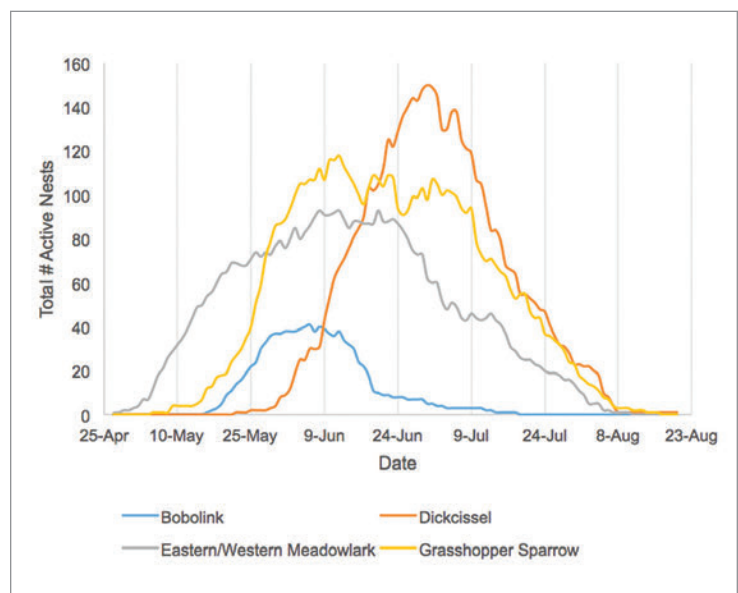


Figure 17. Total number of active nests per day for Bobolink (n=62), Dickcissel (n=300), Eastern/Western Meadowlark (n=286) and Grasshopper Sparrow (n=343), for nests monitored in Illinois between 1995-2009 (Herkert, unpublished data).

GRASSLAND BIRD MODELING IN THE CHICAGO WILDERNESS

With the goal of conserving and restoring native grassland prairies and the wildlife that depend on them, the Chicago Wilderness Grassland Bird Task Force developed a landscape conservation design for the grassland birds in the greater Chicago region. As a first step in this process, we combined standardized avian point count survey data (conducted primarily by community science volunteers of the Bird Conservation Network) with geographical data—including land cover composition and configuration, soils, and vegetation productivity—to model abundance of five grassland bird species. We then refined the models with additional data from partners and expert review to create maps showing existing grassland bird habitat and population estimates for species of conservation concern. The CW region is estimated to support populations totaling more than 100,000 individual birds, belonging to five grassland bird species of concern (Table 1).

Table 1. Estimated population of grassland bird species in the Chicago Wilderness region from Wilsey et al, 2015.

| Species | Estimated Chicago Wilderness Population |
|---------------------|---|
| Bobolink | 62,700 |
| Eastern Meadowlark | 33,500 |
| Grasshopper Sparrow | 3,200 |
| Henslow's Sparrow | 4,700 |
| Sedge Wren | 4,000 |

Modeled grassland bird habitat and abundances were summarized with water filtration, flood control, groundwater recharge, and carbon storage data from the Chicago Wilderness Green Infrastructure Vision (GIV), which aims to identify opportunities for conservation and restoration based on these ecosystem services. Overall, grassland bird habitat within seven Chicago Metropolitan Region counties provides more than \$900 million in ecosystem services annually, with approximately half of that value provided by unprotected lands (Table 2).

Table 2. Annual ecosystem service value of grassland bird habitat in the Chicago metropolitan region from Wilsey et al, 2015.

| | Acres | Flood protection | Groundwater Recharge | Water Purification | Carbon Storage | All services |
|-------------------|---------|------------------|----------------------|--------------------|----------------|--------------|
| Protected lands | 46,059 | \$360 M | \$68 M | \$40 M | \$802 K | \$468 M |
| Unprotected lands | 92,966 | \$298 M | \$95 M | \$45 M | \$955 K | \$439 M |
| Total | 139,024 | \$658 M | \$163 M | \$85 M | \$2 M | \$908 M |

The Chicago Wilderness Grassland Bird Task Force is now focused on building bottom-up habitat and population objectives for the region. The major conservation land owners and the Task Force are now developing county-level grassland plans that are realistic and cost-benefit based. Combined, these county objectives will inform regional targets that can be tracked over time.

LAND MANAGEMENT DATA COLLECTION AND DISCUSSION

In 2017, the Chicago Wilderness Grassland Bird Task Force collected data on haying, mowing, and prescribed burning activities on all county-owned grasslands, to increase our understanding of how specific land management actions might contribute to the recovery and conservation of grassland birds. With these data, we are poised to more effectively coordinate land management on a landscape scale to improve bird conservation.

Six counties (Cook, DuPage, Lake, Kane, McHenry, and Will) participated in the data-collection process, answering the following questions on a site-by-site basis (Table 3):

Table 3.

| Management Action | Timing |
|---|--|
| Dominant Plant Community | <ul style="list-style-type: none"> • Is the site dominated by cool or warm season vegetation? |
| Haying | <ul style="list-style-type: none"> • Is early haying occurring (January 1 – May 31)? • Is mid-season haying occurring (June 1 – July 31)? • Is late-season haying occurring (August 1 – December 31)? |
| Prescribed Burning | <ul style="list-style-type: none"> • Is the site in a burn regime (burned in last three years or anticipated to burn in next three years)? • Was the site burned in 2017? Was it burned in spring or fall? |
| Conservation Mowing (mowing for purposes other than hay production, usually to control invasive species) | <ul style="list-style-type: none"> • Was the site mowed in 2017? • Was the site mowed during the early season (January 1 – May 31)? • Was the site mowed during the mid-season (June 1 – July 31)? • Was the site mowed during the late season (August 1 – December 31)? |

The maps and graphs on the following pages (Figures 18-21) show grasslands and land management actions on county forest preserve lands within the Chicago Wilderness. Aside from Figure 18, which shows some state and federally-owned lands and private properties, all subsequent maps (Figures 19-21) capture only county-owned grassland management actions.

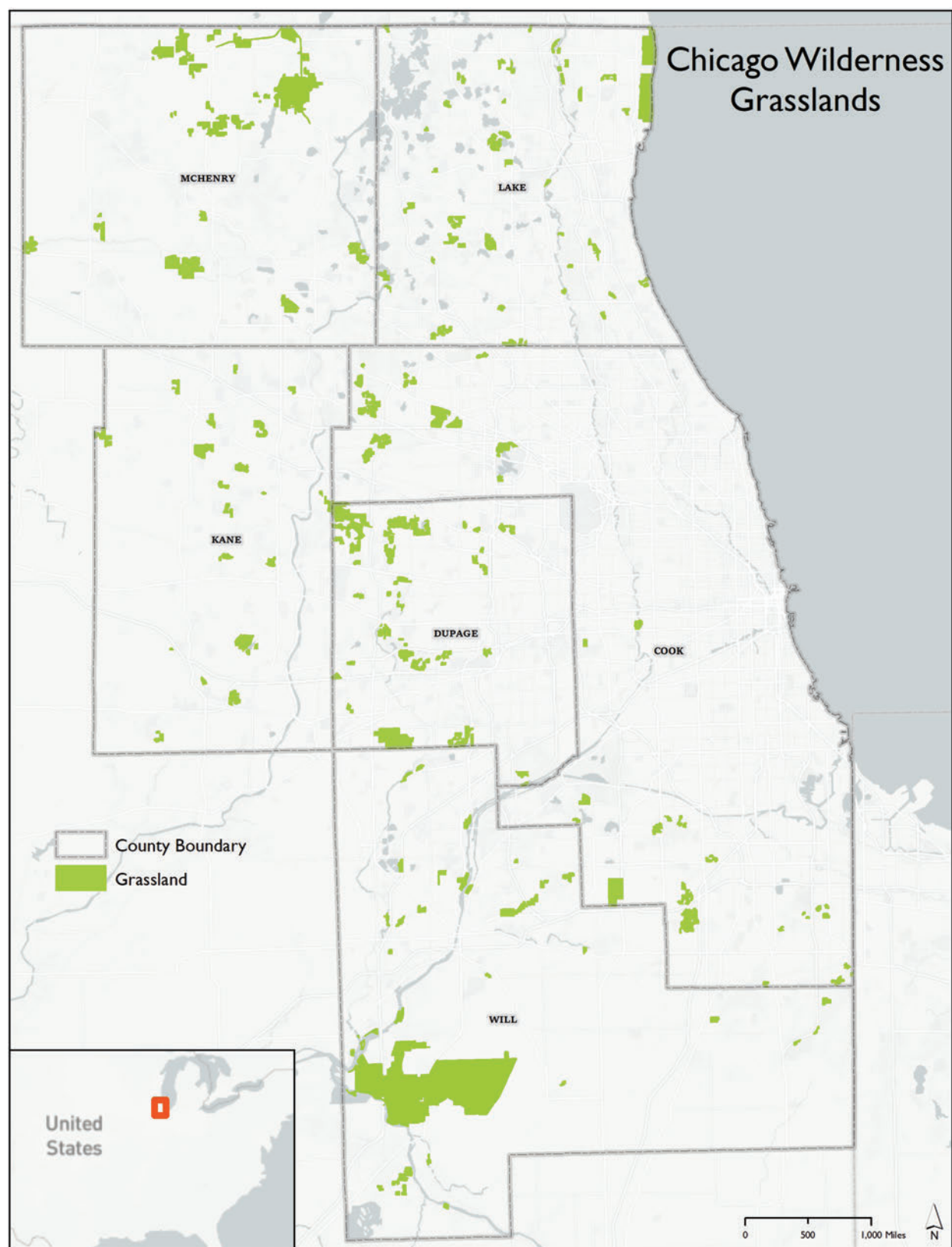


Figure 18. Chicago Wilderness grasslands in the Chicago Metropolitan area. Includes Forest Preserve properties as well as federal and state lands such as Midewin National Tallgrass Prairie, Illinois Beach State Park, Hackmatack National Wildlife Refuge.

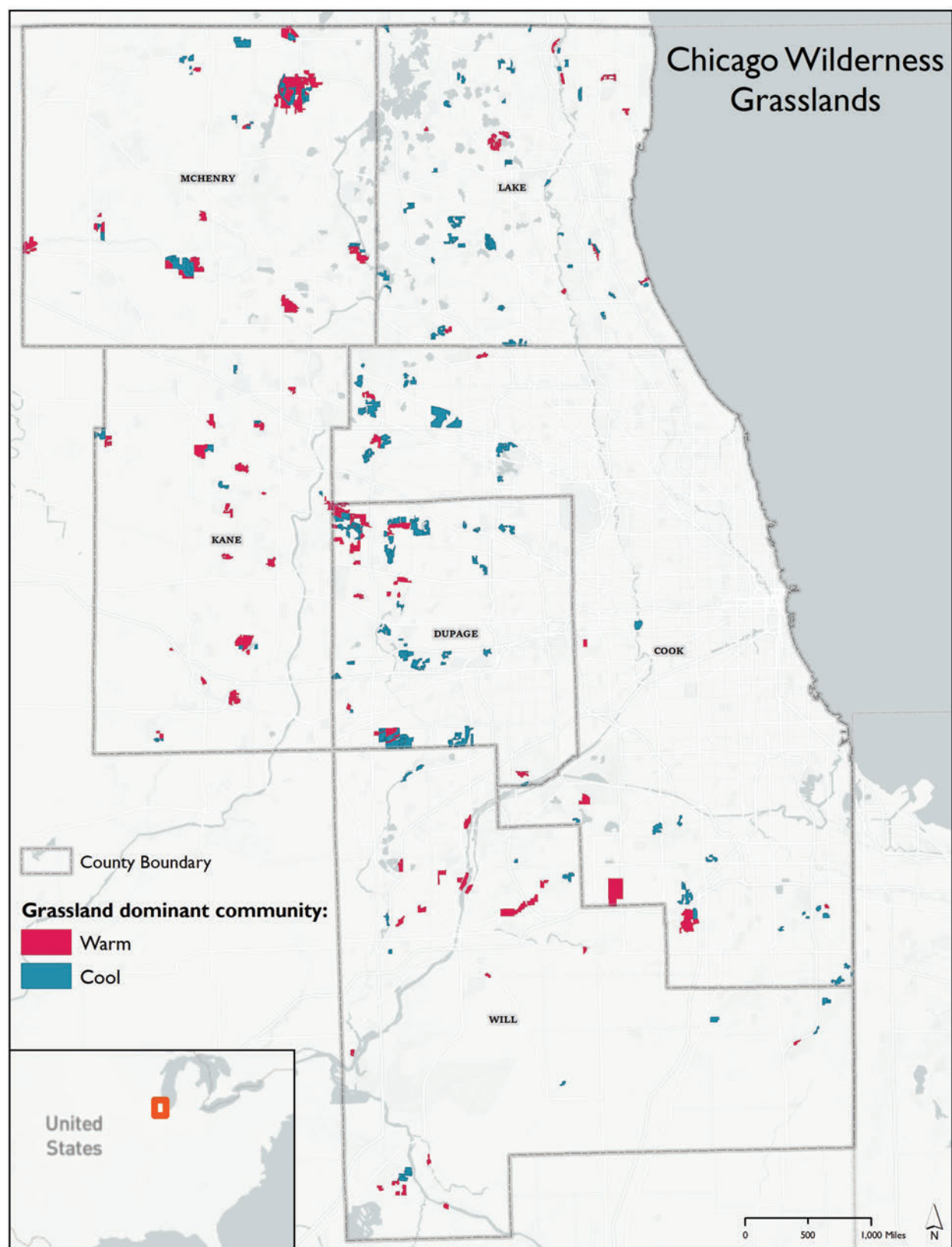


Figure 19. Chicago Wilderness grasslands dominated by warm or cool season plant communities.

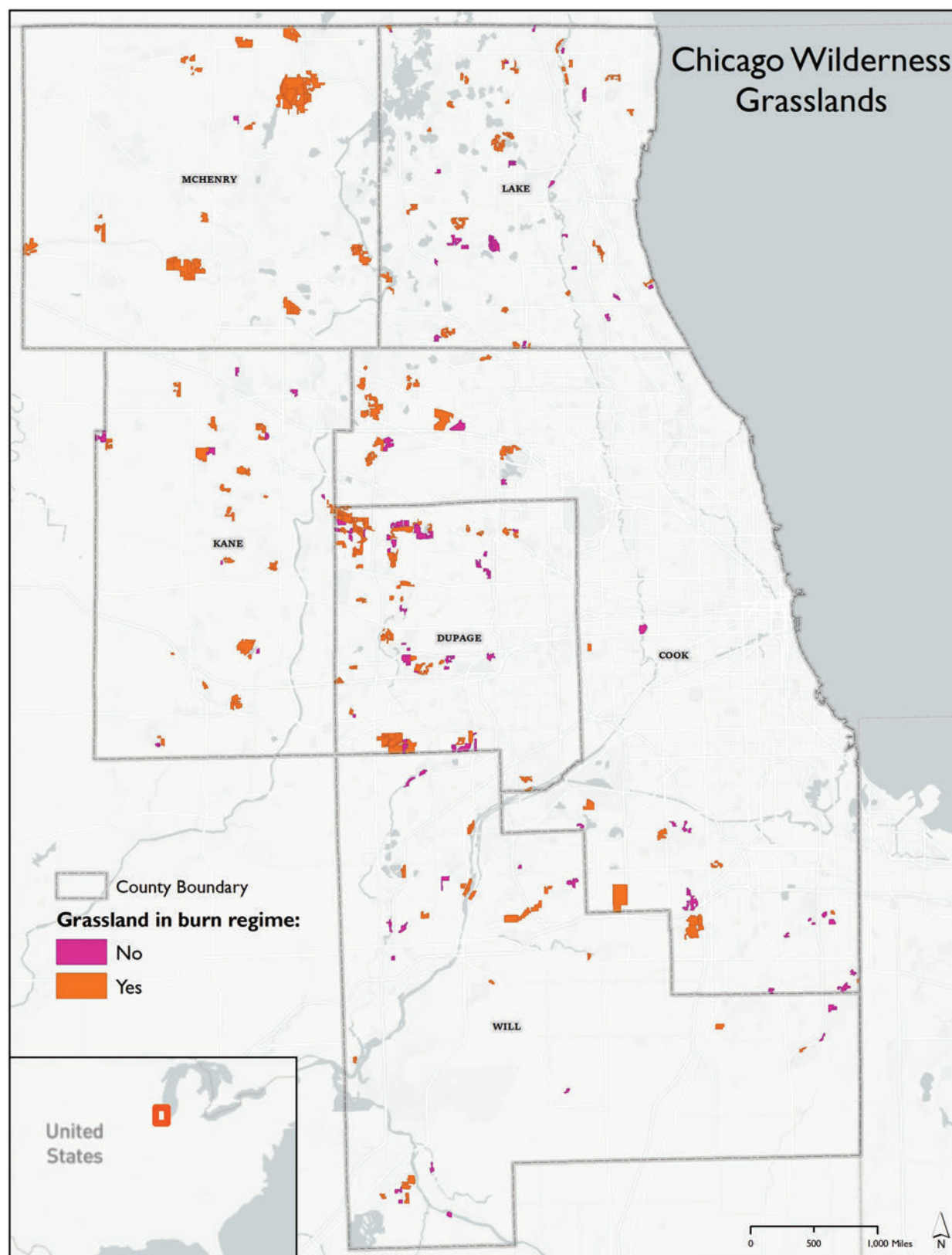


Figure 20. Grasslands managed by prescribed fire. "Regime" defined as either burned in last three years or there are plans to burn within the next three years.

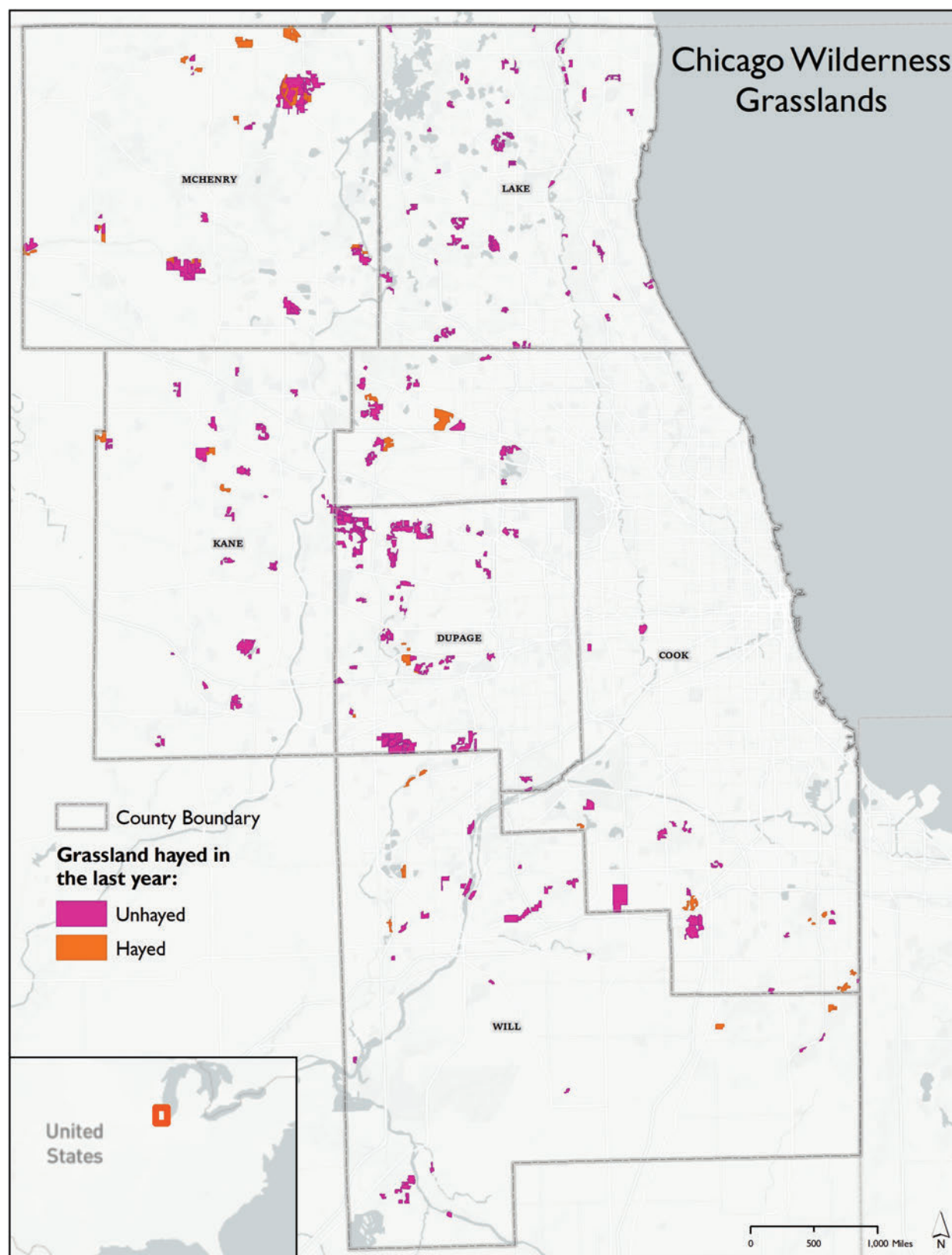


Figure 21. Haying status within Chicago Wilderness grasslands

Results of data collection indicate that the split between warm and cool-season grasslands in the CW region is roughly 50:50 (Table 4). A total of 63,485 acres of grassland exist in the region, and 58,584 acres are actively managed, encompassing 92% of all grasslands. The dominant management action is burning (79% of all managed grasslands are in a burn regime; Table 4).

Table 4. Chicago Wilderness grassland acres by dominant vegetation type (cool or warm season) and management action (in some cases overlap in management actions may exist). Haying regimes were classified as early (Jan. 1-May 31, 2017), mid (Jun. 1-Jul. 31, 2017) or late-season (Aug. 1-Dec. 31, 2017).

| County | Cool Season | Warm Season | Burn Regime | Early-season Haying | Mid-season Haying | Late-season Haying | No Management | Total Grassland Acres |
|--------------------|-------------|-------------|-------------|---------------------|-------------------|--------------------|---------------|-----------------------|
| Cook | 3,820 | 2,675 | 5,130 | 0 | 0 | 1,905 | 295 | 6,495 |
| DuPage | 5,697 | 2,667 | 6,033 | 315 | 292 | 292 | 817 | 8,364 |
| Kane | 705 | 2,695 | 3,033 | 211 | 211 | 457 | 144 | 3,400 |
| Lake | 2,114 | 912 | 2,259 | 0 | 0 | 0 | 1,299 | 3,026 |
| McHenry | 3,074 | 5,517 | 8,517 | 0 | 0 | 2,247 | 0 | 8,591 |
| Will | 1,018 | 2,115 | 2,115 | 0 | 197 | 579 | 490 | 3,133 |
| Totals | 16,427 | 16,582 | 27,087 | 526 | 700 | 5,479 | 3,044 | 33,009 |
| % of CW Grasslands | 50% | 50% | 82% | 2% | 2% | 17% | 9% | |

CLIMATE CHANGE

Aside from the threat of habitat loss and the hazards that come with migration and predation, our warming climate may have catastrophic effects on already-vulnerable species. Audubon's climate change models predict a major shift in climatic breeding range suitability for the Bobolink for example (Figure 22). In this scenario, projected to 2080, the Bobolink's preferred climactic conditions will exist almost solely in Canada. While Canada contains some suitable prairie habitat, the vast majority is boreal forest—in which the Bobolink can not successfully breed. Other species will experience similar shifts in summer and winter ranges, leading to increased uncertainty over how these species will fare in the long-term—regardless of habitat availability or quality.

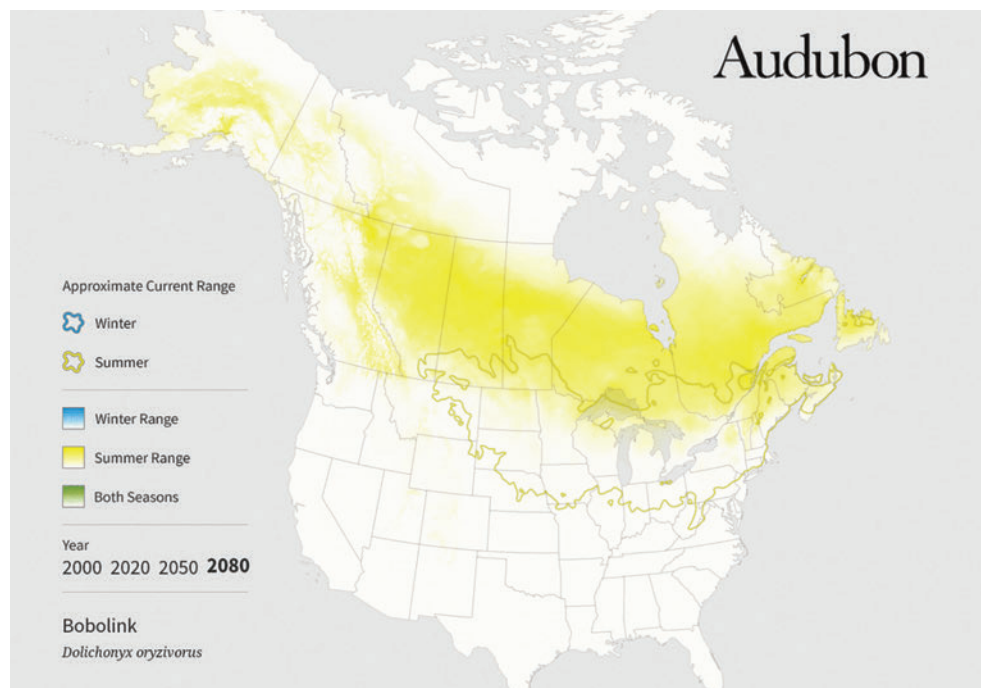


Figure 22. Current (yellow outline) and projected (tinted yellow) Bobolink summer range in 2080 (National Audubon Society, 2015). Map Credit: Kenn Kaufman.

REFERENCES

- Bird Conservation Network. 2013. Breeding bird population trends for the Chicago region (1999-2012).
- Bollinger, E. K., P. B. Bollinger and T. A. Gavin. 1990. Effects of hay-cropping on eastern populations of the Bobolink. Wildl. Soc. Bull. no. 18:142-150.
- eBird. 2018. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: <http://www.ebird.org>. (Accessed: May 1, 2018).
- Herkert, J. R., D. E. Kroodsmas, and J. P. Gibbs. 2001. Sedge Wren (*Cistothorus platensis*), version 2.0. In The Birds of North America (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. <https://org/10.2173/bna.582>
- Herkert, J. R., P. D. Vickery, and D. E. Kroodsmas. 2002. Henslow's Sparrow (*Ammodramus henslowii*), version 2.0. In The Birds of North America (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. <https://org/10.2173/bna.672>
- Herkert, J. R. 2015. Northern Illinois grassland bird surveys. Unpublished raw data.
- Illinois Department of Natural Resources. 2015. Illinois Wildlife Action Plan.
- Jaster, L. A., W. E. Jensen, and W. E. Lanyon. 2012. Eastern Meadowlark (*Sturnella magna*), version 2.0. In The Birds of North America (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. <https://org/10.2173/bna.160>
- Renfrew, R., A. M. Strong, N. G. Perlut, S. G. Martin, and T. A. Gavin. 2015. Bobolink (*Dolichonyx oryzivorus*), version 2.0. In The Birds of North America (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. <https://org/10.2173/bna.176>
- Rosenberg, K.V., J. A. Kennedy, R. Dettmers, R. P. Ford, D. Reynolds, J.D. Alexander, C. J. Beardmore, P. J. Blancher, R. E. Bogart, G. S. Butcher, A. F. Camfield, A. Couturier, D. W. Demarest, W. E. Easton, J.J. Giocomo, R.H. Keller, A. E. Mini, A. O. Panjabi, D. N. Pashley, T. D. Rich, J. M. Ruth, H. Stabins, J. Stanton, T. Will. 2016. Partners in Flight Landbird Conservation Plan: 2016 Revision for Canada and Continental United States. Partners in Flight Science Committee. 119 pp. <http://www.partnersinflight.org>
- Sauer, J. R., D. K. Niven, J. E. Hines, D. J. Ziolkowski, Jr, K. L. Pardieck, J. E. Fallon, and W. A. Link. 2017. The North American Breeding Bird Survey, results and analysis 1966 - 2015. Version 2.07.2017 USGS Patuxent Wildlife Research Center, Laurel, MD
- White, J., 1978. Illinois natural areas inventory technical report. Vol. 1. Survey methods and results. Illinois Natural Areas Inventory. Urbana.
- Wilsey, C., C. Jensen, and N. Miller. 2015. Grassland bird conservation design in the Chicago region: Mapping abundance and ecosystem service value to identify conservation opportunity. National Audubon Society, New York, NY, USA.
- National Audubon Society. 2015. Audubon's Birds and Climate Change Report: A Primer for Practitioners. National Audubon Society, New York. Contributors: Gary Langham, Justin Schuetz, Candan Soykan, Chad Wilsey, Tom Auer, Geoff LeBaron, Connie Sanchez, Trish Distler. Version 1.3.



PHOTO: JIM ROOT

Recommended Citation

Suarez, D., Beilke, S., and Herkert, J. 2018. State of the Grasslands: Chicago Wilderness – 2018. National Audubon Society and Illinois Audubon Society.

This publication was made possible by funding from Grand Victoria Foundation.