Migratory Bird Feature Usage at LaBagh Woods

Pilot Study

Spring 2023

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Introduction

This report is a compilation of the observations of 8 experienced birders and bird habitat restorationists who walked LaBagh Woods in the Forest Preserves of Cook County Illinois weekly during spring migration 2023 (late March through May) and noted which features were in use by migratory birds. The purpose of this report is to inform management efforts at LaBagh using these observations. The motivation for this study was to observe how birds are using the features of the site 8 years into the restoration, and to compile those results in a manner useful to the stewards, land managers, and local bird conservationists. This is not a scientific study with a vetted study design.

View looking east from the bridge at LaBagh Woods. One of the notable features of the site is the abundance of tree branches overhanging the North Branch of the Chicago River.
Photo credit: Brighten Jelke

Executive Summary

This report is a compilation of the observations of 8 experienced birders and bird habitat restorationists who walked LaBagh Woods in the Forest Preserves of Cook County Illinois weekly during the 2023 spring migration (late March through May) and noted which features were in use by migratory birds. The purpose of this report is to inform ecological management efforts at LaBagh using these observations.

Beginning in 2015, with approval from the Forest Preserves of Cook County, the help from hundreds of volunteers, and the fundraising resources of the Chicago Ornithological Society, over 4,400 native shrubs have been planted at LaBagh to replace invasive shrub species like buckthorn. Native shrubs were grown from seeds collected along the North Branch of the Chicago River and specially selected for their usefulness to birds in providing food and habitat. This is a paradigm-shifting restoration, as the local norms of habitat restoration in the forest preserves focus on encouraging conditions for oak health, oak reproduction, and herbaceous understory and are a boon to oak-using migrants. The needs of birds that infrequently use oaks are considered less often in restoration planning, and those are the birds for which the LaBagh restoration intends to provide habitat.

The motivation for this study was to document observations of how birds use LaBagh's features, eight years into restoration.

The conclusion of this study is that features most used by migratory birds are canopy trees, branches overhanging the river, and native shrubs. Other important features are edges and multi-layered vegetation. This validates the premise of the bird-focused restoration – that many migratory birds are using LaBagh's shrub and understory layers, and that during restoration a special attempt should be made to preserve them. In their planning, stewards should continue to pay special attention to restoring riverbank vegetation, creating multi-layered habitat, protecting existing native shrubs, and creating dense brushy areas with shrub plantings.

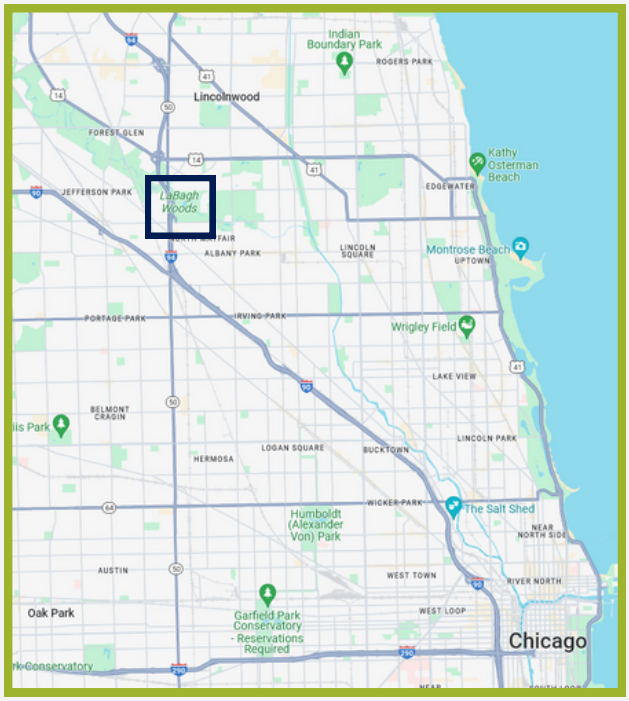
STUDY QUESTION: Which features of the LaBagh site are most frequently used by migratory birds?

Setting

LaBagh Woods is a 160-acre Cook County Forest Preserve located on both sides of the North Branch of the Chicago River. This study focused on the 60 acres of natural area in LaBagh Woods South and Hernandez Grove. One of the most significant features of this forest preserve is its importance to migratory birds. Warblers, thrushes, vireos, flycatchers, finches and many other groups – some of which are on long journeys to and from the tropics – use this land to rest and refuel. As one of the first wooded stops that birds find after the urban development on their way north during migration, LaBagh is one of the most heavily used "rest and refueling stops" for migrant woodland birds in the city and north suburbs.

Beginning in 2015 with approval from the Forest Preserves of Cook County, the help from hundreds of volunteers, and the fundraising resources of the Chicago Ornithological Society, over 4,400 native shrubs have been planted at LaBagh to replace invasive species like buckthorn. Shrubs were grown from seeds collected along the North Branch of the Chicago River and specially selected for their usefulness to birds in providing food and habitat. All native shrub plantings have been fenced in exclosures to protect from deer, which are overpopulated at the site. More information about the planting is available here:

- https://www.chicagobirder.org/labagh
- https://fpdcc.com/big-year-at-labagh-woods/
- https://www.chicagoaudubon.org/blog/2020/6/26/bird-haven-labagh-woods-restoration-in-the-news



Map showing LaBagh Woods and Irene C. Hernandez sections of the North Branch of the Chicago River Trail, a heavily used "rest and refueling" stop for migrating birds, in relation to downtown Chicago and the North Branch wooded riparian zone. Source: Google Maps

Study areas are colored blue on the map below. This study does not include the lawn areas (UM01 and UM02 on map below) nor the 20-acre Sauganash Prairie Grove (W001, SA01, SM01, MA01and FO05 on map below). This study focuses on the ~60 acres to the south and west of Sauganash Prairie Grove – that is, the natural areas northeast of the abandoned railroad right of way (ROW) and those south of the North Branch of the Chicago River, east of Cicero and west of Gompers Park (FO 01, 02, 03, and 04; WO02, 03 and 04; MA02 and 03). This includes sedge meadow, floodplain forest, savanna, a large ephemeral wetland, and woodland including oak woodland.

Methods

Areas covered. The LaBagh site was divided into 3 sections and a different section was walked each observation day. In the northwest section, which is the largest area, the routes varied slightly, but in the other two sections, the same route was covered each time. In all sections, the routes used existing foot paths and attempted to evenly cover the section.

Participants. The number of participants varied each week according to availability. Bird identification ability varied among the group from good to excellent. There was always at least one participant with excellent skills present in the monitoring group.

Observation process. From 3/29/23 through 5/31/23, weather permitting, surveys were taken on Wednesday mornings. No migrants were observed on the final visit. Beginning at 7:30 am and ending between 9 and 9:30 am, the routes were walked by the observers. The number of observers varied from 2 to 8 participants. Group members searched for migratory birds and summer resident birds, except for very common summer residents – robins, grackles, red-winged blackbirds, and cowbirds. When a migratory bird species was found, the species name, location and feature or features it was using were marked on the data sheet. If the bird was in an exclosure of planted native shrubs, the exclosure number was noted. There were two different data recorders in the group over the course of the season – one of which was the designated recorder on each visit. Other participants found and identified birds, kept an eBird list of all birds seen and heard, and observed the LaBagh features being used. The observation data sheet can be found in the appendix.

Definitions and Study Status

Migratory bird: bird species that migrate through the site

Summer residents: bird species that migrate here in spring and stay for the summer to nest at LaBagh or nearby. The most common species that fit this description were **omitted** from the study:

- American robin
- brown-headed cowbird
- common grackle
- red-winged blackbird

Migrants: birds that migrate through LaBagh on their way to summer nesting locations in northern states or Canada; sometimes also called passage migrants

Year-round residents: several woodpeckers, white-breasted nuthatch, black-capped chickadee, cardinal and several others were omitted from the study

Exclosure: fencing around plantings meant to exclude deer

Other songbirds: songbirds that don't fit in one of the species categories used in the analysis (see appendix)

Weber Spur: a raised former railbed that traverses the site running SW to NE and is not owned by the Forest Preserves of Cook County

Features. The list of features was developed from group members' experiences and general familiarity with the literature about migratory bird habitat. Three additional features were added to the initial data sheet in the first two weeks as birds were seen using them: Gravel, Woods, and Slough.

Features assessed were:

- **Woody vegetation adjacent to water**
  - Branches overhanging river – any woody branch hanging over or within a yard of the river bank.
  - Slough – same as above but for slough instead of river
  - Ephemeral wetlands
- **Tree**
  - Dead Tree
  - Canopy Tree – bird is in canopy
  - Woods - bird using wooded area that cannot be characterized by another feature in this list
- **Layered, dense vegetation** – shrubs, understory trees or vines, and canopy
- **Sky** – bird was only observed in flight
- **Brushy Area**
  - Brush pile
  - Brushy area – invasive shrubs
  - Brushy area – pre-existing native shrubs
  - Brushy area – planted shrubs (planted as part of the restoration - exclosure number noted)
- **Gravel** – birds picking on embankment path, could be getting seed or grit
- **Native grassy area**
- **Opening in woods** – open area surrounded by woods.
- **Edge** – transition between wooded area and lawn, dirt road on embankment, or parking lot

Rusty Blackbird (left) and Northern Flicker (right) at LaBagh Woods. Photo credit: Kelly Ballantyne

Data Summary

Fifty-eight species of migrating birds were observed for this study. Twelve of the species observed were Birds of Conservation Concern, species needing priority attention and management in our area according to Partners in Flight, a prominent national bird conservation coalition, as determined by the Chicago-area Bird Conservation Network.

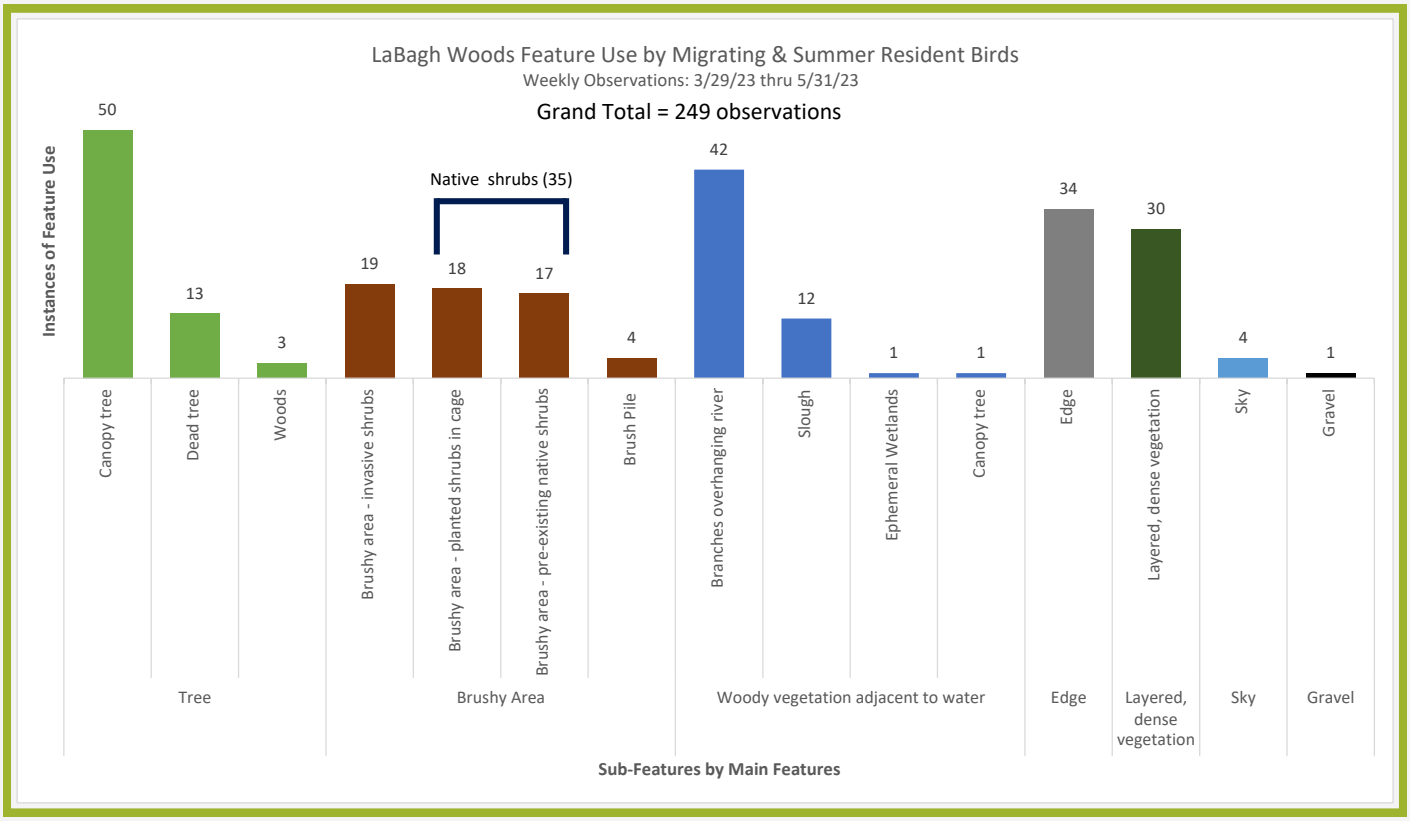
Data was compiled into an Excel spreadsheet, and pivot tables were used to aggregate the data to determine the most-used features. Feature use is calculated by observed instances of use of the feature, which may have been by one or several birds.

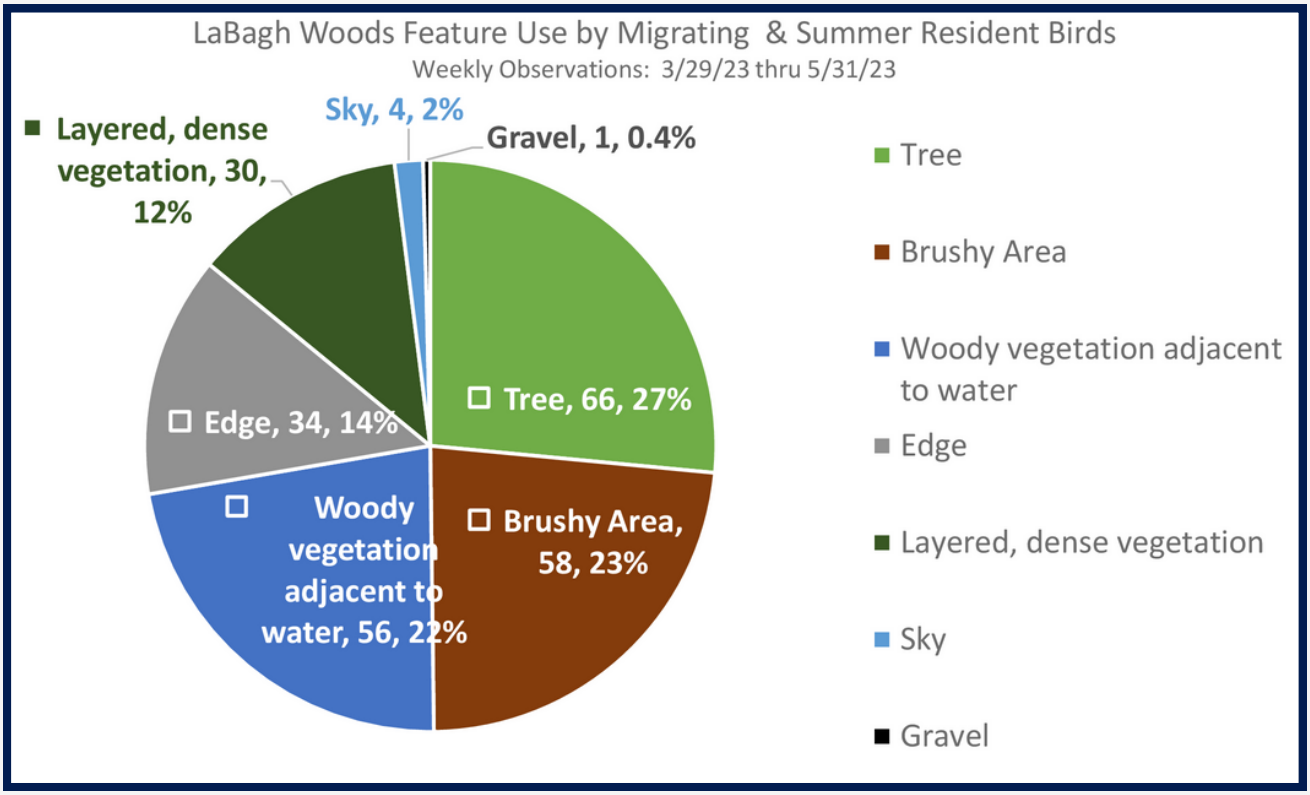
20% **of observed species were Birds of Conservation Concern**

According to observations, the most used features by migrants were:

- Canopy trees - 50 observations
- Branches overhanging river - 42 observations
- Native shrubs - 35 observations

Edges (34 observations) and layered, dense vegetation (30 observations) were also well-used.





Use of planted native shrubs

There were eighteen observations of birds using the native shrubs planted as part of the LaBagh Woods restoration project. The shrubs observed in use were:

- Bladdernut
- Blue-fruited Dogwood
- Chokecherry
- Downy Hawthorn
- Illinois Rose
- Nannyberry
- Ninebark
- Prickly Ash
- Red Osier Dogwood
- Spicebush

The ten different shrub species used by birds represent a good selection of the species planted as part of the restoration efforts.

Both single-species and mixed-species shrub exclosures attracted birds. Birds were observed using the older plantings. Most of the sightings were in shrubs that were planted in the first three years of restoration: 2015, 2016 and 2017. At the time of this report, these shrubs are between 5 and 7.5 years old. The bird species using shrubs (certain warblers, kinglets, and wrens) are those that were shown in a study to use oaks infrequently, or that are known for their use of understory (see “Oak-using vs. oak-avoiding birds” section). These are the bird species that are targeted by the native shrub restoration.

Oak-using vs. oak-avoiding birds

A 2004 study conducted in local preserves (including LaBagh) found that spring migrants can be classed into two groups – oak-using and oak-avoiding. There are common and rare migrants in each group, and each group contains species of conservation concern.

The 2004 study results are reproduced on the right. LaBagh Woods is providing valuable habitat for birds that use oaks infrequently, and those birds used brushy areas and woody vegetation adjacent to water frequently during our 2023 observation period.

Birds that heavily used oaks	Birds that infrequently used oaks
Rose-breasted Grosbeak	Wilson's Warbler
Blackburnian Warbler	American Redstart
Bay-breasted Warbler	Yellow Warbler
Palm Warbler	Chestnut-sided Warbler
Baltimore Oriole	Magnolia Warbler
Blue-gray Gnatcatcher	Canada Warbler
Tennessee Warbler	Ruby-crowned Kinglet
Black-throated Green Warbler	Yellow-rumped Warbler

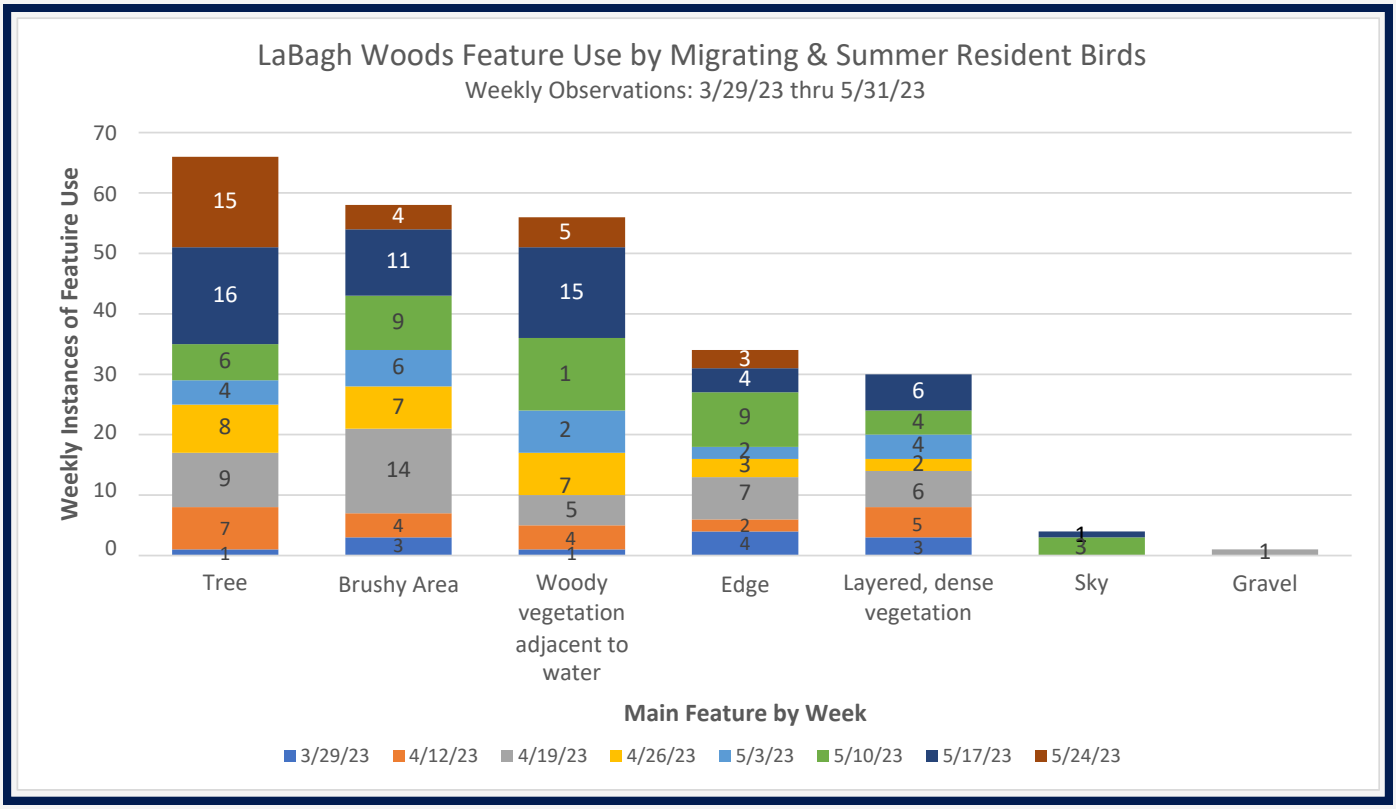
Pollock, J. & Glennemeier, K. & Stotz D. (2004). Migrant Bird Habitat Study. https://www.csu.edu/cerc/researchreports/documents/MigrantBirdHabitatStudy2004.pdf

Canada Warbler (left) and Ruby-crowned Kinglet (right) at LaBagh Woods. Both species have been found to infrequently use oaks. Photo credit: Kelly Ballantyne and J'orge Garcia

Discussion

Features most used by migratory and summer resident birds are canopy trees, native shrubs, and woody vegetation adjacent to water (river and slough). Other important areas are edges and multi-layered vegetation. This validates the premise of the bird-focused restoration – that many migratory birds are using LaBagh's shrub and understory layers and riverbank vegetation, and that during restoration a special attempt should be made to preserve and restore them. Migratory birds are already using the older shrub plantings, and we can expect that as the plantings age and grow, we will see more migrant birds using them.

Although not the focus of this exercise, other patterns can be described from our observations. As expected, features were used differently over time. Brushy areas were most used in the earlier weeks, when sparrows, palm warblers, and other birds that feed close to the ground are more prevalent. Once trees leafed out and became attractive to larvae of invertebrates, a pulse of insect-eaters such as other warblers, vireos, and flycatchers arrived. Those birds were responsible for the heavier use of canopy trees and woody vegetation adjacent to water in the later months. Insects hatch out of the water around this time – for example, the swarms of midges that emerge in the first week of May.



Most used location

On our first visit (and also observed on non-birding walks at that time), a buckthorn thicket across the river from the Hawthorn Grove area had the most birds, both in number and diversity. These were the common year-round woodland residents plus juncos, a winter visitor. We can surmise that thickets are important for wintering birds.

As the season progressed, areas with layered vegetation near the river and vegetation overhanging the river stood out for their concentrations of birds. The bridge over the river had many sightings, and the layered dense vegetation along the river near Gompers Park also usually held birds.

Oak-using vs. oak-avoiding birds

The local norms of habitat restoration in the forest preserves focus on encouraging conditions for oak health and oak reproduction and are a boon to oak-using migrants. The needs of birds that infrequently use oaks are considered less often in restoration planning, and those are the birds for which the LaBagh restoration hopes to provide habitat. Our data suggests that oak-avoiding birds heavily use woody vegetation adjacent to water as well as brushy areas.

Birds that heavily use oaks

Main Feature	Bird Species	Count
Woody vegetation adjacent to water	**Total** • Palm Warbler • Blue-Gray Gnatcatcher • Blackburnian Warbler	**7** 4 2 1
Tree	**Total** • Baltimore Oriole • Palm Warbler • Tennessee Warbler • Blue-Gray Gnatcatcher	**7** 3 2 1 1
Edge	**Total** • Blue-Gray Gnatcatcher • Baltimore Oriole • Tennessee Warbler • Palm Warbler	**6** 2 2 1 1
Brushy Area	**Total** • Blue-gray Gnatcatcher • Palm Warbler • Blackburnian Warbler	**6** 3 2 1
Layered, dense vegetation	**Total** • Blue-gray Gnatcatcher • Black-throated Green Warbler	**4** 3 1
Grand Total		**30**

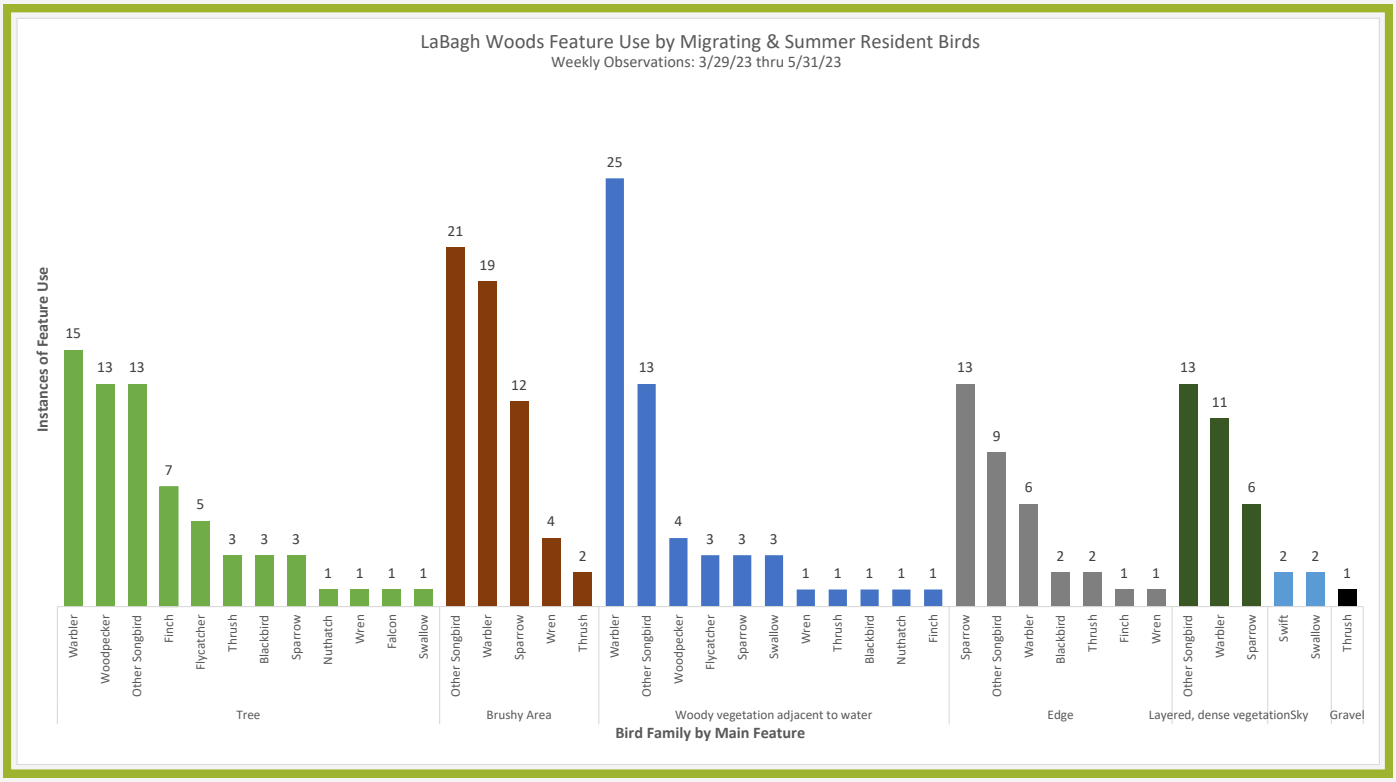
Birds that infrequently use oaks

Main Feature	Bird Species	Count
Woody vegetation adjacent to water	**Total** • Yellow-rumped Warbler • Ruby-crowned Kinglet • Yellow Warbler • Wilson's Warbler • Magnolia Warbler • American Redstart	**14** 6 4 1 1 1 1
Tree	**Total** • Ruby-crowned Kinglet • Yellow-rumped Warbler • American Redstart • Magnolia Warbler • Chestnut-sided Warbler	**10** 3 3 2 1 1
Edge	**Total** • Ruby-crowned Kinglet • Yellow-rumped Warbler • American Redstart	**4** 2 1 1
Brushy Area	**Total** • Ruby-crowned Kinglet • Yellow-rumped Warbler • Wilson's Warbler • Magnolia Warbler • American Redstart	**13** 7 3 1 1 1
Layered, dense vegetation	**Total** • Ruby-crowned Kinglet • Yellow-rumped Warbler • American Redstart	**7** 4 2 1
Grand Total		**48**

Most used features

The fifty-eight species observed represent the diversity of birds that use LaBagh in the spring and included twenty warbler species, both kinglets, three vireos, three thrushes, three flycatchers, and six sparrow species. All observers agree that this is an accurate representation of the site's bird life.

Although the study may not have robust samples from every bird group, the data does provide a general idea of which features the common families are using. Warblers and other songbirds are by far the biggest groups found in woody vegetation adjacent to water, and brushy areas are used by warblers, other songbirds, and sparrows.



Field Sparrow (left) and American Tree Sparrow (right) at LaBagh Woods on April 19, 2023. Both are Birds of Conservation Concern. Photo credit: J'orge Garcia

Birds of Concern

Birds of Conservation Concern are determined by the Bird Conservation Network, who study national lists and identify the ones which have breeding or significant migrating populations in the Chicago region. Twelve of fifty-eight species observed were Birds of Conservation Concern. One of the birds nests in the preserve (Northern Flicker) and the other eleven are migrants, showing the importance of LaBagh to migratory birds.

Disclaimers

This is not a scientific study but a compilation of observations by qualified observers: site bird monitors, birders, stewards, and restoration volunteers.

Some factors to take into account when reviewing the results:

- Most features were present in all sections of LaBagh Woods, but features were not equally distributed in each section.
- Some features that were not well-defined – for example, “layered dense vegetation” or “canopy tree” — may not have been equally applied by the two different recorders. In some cases, both were interpreting as they were recording.
- The list of features was developed from participants’ knowledge of the scientific literature and observations; there may be other features that the birds were responding to that participants did not discern. However, there was good agreement from the group about the list of features.
- There was no attempt to control for independence of variables; in a few cases, birds may have been recorded using different features on successive foraging events.
- Sometimes one observation incorporated multiple features (i.e., edge plus shrubs).
- Initially, flocks were recorded separately. The protocol was changed to treat all members of a flock as individuals.

Despite these shortcomings of the study, all participants confirm that the results accurately capture the features being used by birds based on their years of casual observations and agree that recommendations based on the results be incorporated into site management.

Weather

It was an unusual spring in that there was no rain, and the site experienced drought by the end of the study period. Ephemeral wetlands were smaller and drier than usual. Migration was affected by frequent north winds. (Birds often fly around or over LaBagh Woods on days of north wind.) Leaf-out was ahead of the 1990’s and 2000’s observations by a week or two (observer estimates), as is common in recent years.

Implications for Stewardship

The trees in LaBagh's wooded areas are very important for birds, and restoration is allowing for regeneration and healthy growth of oak trees, which are critical for migrating and nesting birds. In addition, the native shrub plantings, shrubby areas, layered vegetation, edges, and wooded areas along the river are providing important habitat for the many species of migratory birds that use LaBagh.

The idea of maintaining the diversity of structure (canopy, understory, shrub and herbaceous layers) and woody plant species proves to be very useful for maintaining migratory bird habitat at LaBagh, one of the Forest Preserve of Cook County's most important migratory bird habitats, and certainly the most important on the North Branch.

01

Riverbank Preservation

Preserving and augmenting riverbank vegetation by planting native shrubs.

02

Protection

Protecting existing native shrubs against deer browse. Currently, fencing is the most effective protection.

03

Multilayered habitat

Areas that would benefit from multi-layered habitat include:

- Northeast of the bridge
- Along the Weber Spur southwest from the bike trail crossing
- The northeast end of Hernandez

04

Increasing dense brushy areas

Creating dense brushy areas through native shrub plantings, including clumps of shrubs in open areas.

Development of the Weber Spur path into a paved bike trail to link the North Branch Trail System with the Valley Line Trail (Skokie Line Trail) may wipe out some of the best bird habitat. LaBagh stewards should continue efforts to be included on the planning team for that project, as well as trying to create or maintain thickets in adjacent habitat areas.

Other Conclusions

- LaBagh Woods is heavily used by migrating warblers.
- This site is very important to the conservation of migrating birds, including Birds of Conservation Concern. Twelve species of conservation concern were observed in our study.
- Different families use different features, so it is important to conserve a variety of layers of woody vegetation at LaBagh.
- Use of different features varied by week as different families passed through: brushy areas were most important in earlier weeks when the bulk of seed-eaters pass though; trees, trees over water, and edge were more important when the insect-eaters predominated in later weeks.
- This study design might be improved and used again to assess migrants' and summer residents' use of features at LaBagh or other sites.
- This study could be improved by quantifying the percentage of each feature, better standardizing the coverage, and agreeing on the protocol and features in advance of recorded site visits.

Golden-winged Warbler (upper left), Palm Warbler (lower left), and Gray Catbird (right) at LaBagh Woods. Photo credit: Kelly Ballantyne

Data

Spreadsheets will be sent separately upon request. Contact: chicagobirder@gmail.com

Appendix 1: List of Birds Observed by Family

Family/Species	Count
Blackbird	**6**
• Baltimore Oriole	5
• Rusty Blackbird	1
Falcon	**1**
• American Kestrel	1
Finch	**9**
• American Goldfinch	3
• Purple Finch	3
• Indigo Bunting	3
Flycatcher	**8**
• *Flycatcher sp.*	*4*
• Great Crested Flycatcher	2
• Least Flycatcher	1
• Eastern Phoebe	1
Nuthatch	**2**
• White-breasted Nuthatch	2
Other Songbird	**72**
• Ruby-crowned Kinglet	20
• Golden-crowned Kinglet	11
• Blue-gray Gnatcatcher	11
• Golden-crowned Kinglet	8
• Brown Creeper	7
• Warbling Vireo	4
• Gray Catbird	4
• Red-breasted Nuthatch	4
• Red-eyed Vireo	2
• Yellow-throated Vireo	1
Sparrow	**37**
• Song Sparrow	9
• White-throated Sparrow	8
• Dark-eyed Junco	8
• Field Sparrow	5
• Lincoln's Sparrow	3
• Chipping Sparrow	2
• White-crowned Sparrow	1
• *Sparrow sp.*	*1*
Swallow	**6**
• Tree Swallow	4
• Barn Swallow	2

Family/Species	Count
Swift	**2**
• Chimney Swift	2
Thrush	**9**
• Hermit Thrush	6
• Swainson's Thrush	2
• Veery	1
Warbler	**73**
• Yellow-rumped Warbler	15
• Palm Warbler	9
• Common Yellowthroat	7
• Northern Waterthrush	6
• American Redstart	6
• Nashville Warbler	5
• Black-and-white Warbler	4
• Magnolia Warbler	3
• Blackburnian Warbler	2
• Wilson's Warbler	2
• Tennessee Warbler	2
• Northern Parula	2
• Ovenbird	2
• Orange-crowned Warbler	2
• Golden-winged Warbler	1
• Connecticut Warbler	1
• Yellow Warbler	1
• Black-throated Blue Warbler	1
• Black-throated Green Warbler	1
• Chestnut-sided Warbler	1
Woodpecker	**17**
• Northern Flicker	11
• Red-headed Woodpecker	3
• Red-bellied Woodpecker	2
• Downy Woodpecker	1
Wren	**7**
• House Wren	7
Grand Total	**249**

Count reflects the number of observations of a species present in a given location on a given day, not a total count of individuals. The grand total includes birds that were only identified by family.

Appendix 2: Weekly Data Sheet

Name: Date:
Ebird link: Route:

Features used (add location number from list below)

- Opening in woods
- Dead Tree
- Gravel
- Woods
- Native grassy area
- Branches overhanging river
- Brushy area – invasive shrubs
- Brushy area – pre-existing native shrubs
- Brushy area – planted shrubs (note exclosure number)
- Canopy Tree
- Edge
- Layered, dense vegetation
- Sky
- Slough
- Ephemeral Wetlands
- Brushpile

Migratory birds (not robins, grackles, rwbb, cowbird) or flocks (3 spp or more) and location

1.
2.
3.
4.
5.
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12.
13.
14.
15.

Appendix 3: Links to Weekly eBird Checklists

1. March 22, 2023: https://ebird.org/checklist/S131520992
2. March 29, 2023: https://ebird.org/checklist/S132121684
3. April 5, 2023: no walk due to heavy rain
4. April 12, 2023: https://ebird.org/checklist/S133500892
5. April 19, 2023: https://ebird.org/checklist/S134275905
6. April 26, 2023: https://ebird.org/checklist/S135067562
7. May 3, 2023: https://ebird.org/checklist/S135932620
8. May 10, 2023: https://ebird.org/checklist/S136912530
9. May 17, 2023: https://ebird.org/checklist/S138274855
10. May 24, 2023: https://ebird.org/checklist/S139086493
11. May 31, 2023: https://ebird.org/checklist/S139999078

Red-headed Woodpecker (left), American Kestrel (upper right), and Ovenbird (lower right) at LaBagh Woods. Photo credit: Kelly Ballantyne and J'orge Garcia