

# PROJECT BOBOLINK

**Grassland Bird Conservation at Heaven Hill  
Prepared for the Henry Uihlein II & Mildred A.  
Uihlein Foundation by the Paul Smith's College  
Adirondack Watershed Institute  
2023**



**PAUL SMITH'S COLLEGE  
ADIRONDACK  
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## Grassland Bird Conservation at Heaven Hill Farm 2023 Report to the Uihlein Foundation

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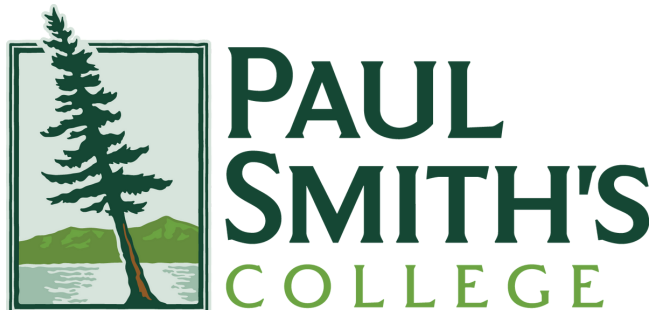
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## Acknowledgements

We owe a debt of gratitude to Ellen Jones, who continues to make enormous contributions to the project by providing data from numerous visits to Heaven Hill throughout the season. Her visits early in the season, in particular, have helped us to establish arrival dates and her extensive notes have contributed to our knowledge of the breeding chronology for bobolink and savannah sparrow at this site. As always, we greatly appreciate the assistance of Jim McKenna who has been enormously supportive throughout our work at Heaven Hill. We thank Larry Master for continuing to allow us to use his wonderful bird photos. We thank Jill Walker for allowing us to make use of her thermal drone and Brendan Wiltse for flying it for us again this season. We also thank Carli Courville and Stephanie Rock for collecting observations in 2023. As ever, Ray Curran is invaluable in the management and execution of this project. We appreciate his knowledge and advice, willingness to meet with us frequently throughout the season, and abundant enthusiasm for botany. We thank Northern New York Audubon for their support of this project over several years, and this year we appreciate financial support for the purchase of field equipment that enhanced our ability to document species at Heaven Hill and Uihlein Farm. Last, we deeply appreciate the support of the Henry Uihlein II & Mildred A Uihlein Foundation, the willingness of the Foundation to consider and undertake management actions that help conserve grassland birds, and the opportunity to again partner with you on this project.





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## Introduction

This year marked our 5th season of working with the Henry Uihlein II and Mildred A. Uihlein Foundation to address concerns related to grassland birds breeding at Heaven Hill and Uihlein Farm. Since we started, the Uihlein Foundation has undertaken critical efforts to increase our understanding of grassland bird breeding and behavior at both sites, and to implement protection measures and habitat improvements. Grassland birds are highly imperiled, with the bobolink (*Dolichonyx oryzivorus*) among a group of birds that have lost half or more of their populations in 50 years, and are on a trajectory to lose another half in the next 50 (North American Bird Conservation Initiative 2022). This makes the work of the Foundation to protect bobolink and other species even more critical. Although the Adirondack Park is far outside of the historical core grasslands in North America, the plight of this and other grassland specialist species argues for the value of conservation actions aimed at their protection, at all scales and locations. This report describes our activities and findings during the 2023 season.

## Methods

### *Documentation of Breeding Chronology and Informal Observations of Other Species*

In 2023, we employed established methods to document birds and breeding activity at Heaven Hill Farm, making use of our Survey123 smartphone data collection tool developed in 2021. We visited the site multiple times throughout the season to observe occurrence and breeding activity



of bobolinks and savannah sparrows until all apparent breeding activity had ended. As in prior seasons, informal, continuous bird counts were used throughout the breeding season by recording every bird species heard or seen while walking the fields and other areas of the property and observing both the savannah sparrows and bobolinks. These data help to describe the entire bird community present on the property, and are an opportunity to document occurrence of species other than the target grassland birds.

Additionally, behavioral observation of bobolinks and savannah sparrows were made throughout the breeding season. As previously, we recorded all bobolinks detected, whether males or females, and documented behavior patterns and areas of the property where activity was concentrated. The purpose of this method



is to document breeding behaviors and locations, as well as response to hay cutting and other management activities. Observations were greatly augmented with data collection by Ellen Jones, who is able to get to the site more frequently and earlier in the season than we are. Ellen uploads all observations to eBird so that the data can also be used for the ongoing third New York State Breeding Bird Atlas effort. We have extracted Ellen's data from eBird and included it here.

### *Thermal Drone Survey*

As in 2022, we were able to again make use of a thermal drone to test its use for the detection of nest locations at Heaven Hill.

This method has been used on several species and in a variety of habitats (Stander et al. 2019, Santangeli et al. 2020) and takes advantage of the fact that birds incubate nests at high temperatures and this heat signature can be detected under appropriate conditions. We scheduled the drone flight to overlap with a time we determined to have high likelihood of birds being on nest. We flew the drone at 5am on June 15 for several flights over the course of approximately 90 minutes until we had exhausted both available batteries. AWI Senior Research scientist Brendan Wiltse piloted the drone and additional observers included Hyla Howe, as well as AWI staff Connor Vara and Carli Courville (Figure 1).

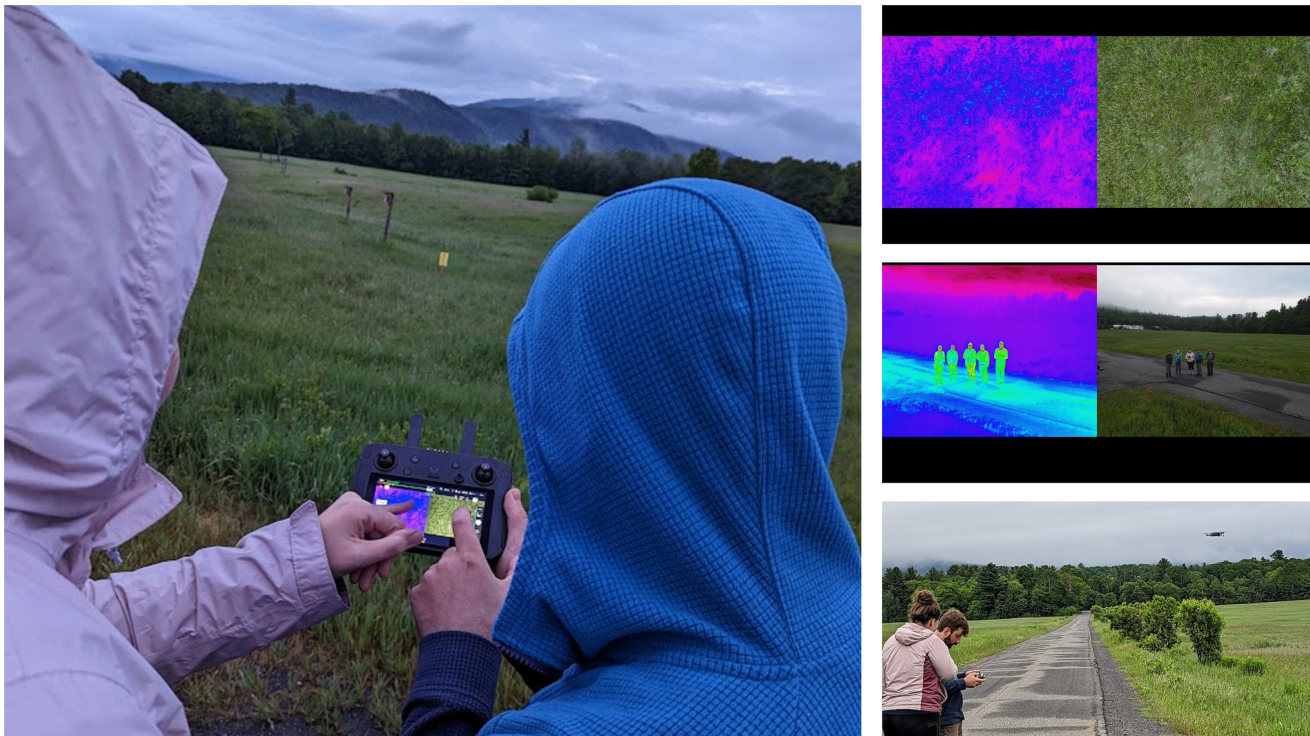


Figure 1. Test of MAVIC drone equipped with thermal sensor for the detection of birds on nest at Heaven Hill, June 15, 2023.



### *Next Box Monitoring*

A total of 15 nest boxes were installed at Heaven Hill in 2021 around the perimeter of the set aside area and have been monitored since that time. They were utilized immediately upon installation as perches by bobolink, savannah sparrow, and other species at Heaven Hill and in 2023 again served as nesting locations for both tree swallow (*Tachycineta bicolor*) and Eastern bluebird (*Sialia sialis*). In addition to providing a de facto fence around the set aside area and preventing the encroachment of mowing into this zone, these boxes provide an opportunity to monitor reproductive output for these 2 additional species. Tree swallow is a good species with which to study the potential impacts of climate change because its nesting success is highly sensitive to temperature and precipitation conditions. We used a standard nest monitoring protocol for *Tachycineta* swallows developed by Cornell (Cornell Lab of Ornithology 2010) and documented the status of birds in the nest boxes as often as possible during the season. Monitoring of nest fate was made easier this season by

the use of an endoscope camera which allows viewing without opening the nest box; equipment was supported in 2023 by a grant from Northern New York Audubon.

### *Essex County Comparative Study*

This season also marked the second year of fieldwork in Essex County related to the MS Thesis project of Hyla Howe. As a direct result of the baseline we have established with research at Heaven Hill, Hyla developed and pursued a thesis project to examine occupancy patterns of bobolink in Essex County and landowner capacity for improved habitat management in the eastern Adirondacks, using Heaven Hill as a critical reference site. The intense mowing in the Champlain Valley region means that the birds breeding in those fields are forced to relocate constantly to attempt to reestablish territories elsewhere and renest. This results in a constantly shifting population and timing which is challenging for the birds and also for research attempting to understand population dynamics. This makes Heaven Hill important not only as a model of one particular management option for other landowners but also as an important scientific benchmark because it functions essentially as an island of habitat on which the disturbance is much more limited and controlled and occurs essentially the same time each season. Hyla's research combined ecological and sociological methods to determine how much of the potential bobolink habitat in Essex County is hayed during the breeding season, which landscape features are associated with habitat use, whether less intensive management leads to greater population resilience, and where high value and high impact areas overlap.



## Findings

### *Overall Bird Species Richness and Relative Abundance*

Informal observations of birds were made throughout the breeding season on 89 visits to the site by AWI or Ellen Jones. We detected a total of 38 species through the course of the season, representing all birds that were identifiable by ear or sight from our location on the property (Table 1). We have also incorporated available information from the ongoing New York State Breeding Bird Atlas. The diversity of species was similar to 2019 - 2022, with the addition of 6 species new to our records at the site - brown thrasher, common grackle, downy woodpecker, evening grosbeak, Northern cardinal, and tufted titmouse. It is important to note that the numbers of birds detected from year to year are not directly comparable and should not be viewed as indices of population change. They are influenced by the (variable) number of visits made to Heaven Hill and the incorporation of additional data from eBird.



Figure 2. Wary tree swallow incubating inside a nest box is captured by Depstech endoscope camera.

The numbers in Table 1 are detections of birds and not a representation of numbers of individual species. Nevertheless, the total number of species we have detected continues to increase each year and is now more than 60, a testament to the diversity and quality of available habitats at Heaven Hill.



Table 1. Bird species detected at Heaven Hill Farm 2019-2023.

Common Name	AOU** code	2019	2020	2021	2022	2023
American crow	AMCR	34	24	63	67	12
American goldfinch	AMGO	10	14	59	53	8
American kestrel	AMKE	2	0	1	7	0
American robin	AMRO	9	15	20	48	9
Barn swallow	BASW	2	9	15	2	0
Barred owl	BADO	1	1	0	0	0
Belted kingfisher	BEKI	3	3	0	0	0
Black-and-white warbler	BAWW	0	0	1	1	0
Blackburnian warbler	BLWA	0	1	0	1	0
Black-capped chickadee	BCCH	8	6	26	37	4
Black-throated blue warbler*	BTBW	2	2	1	1	0
Black-throated green warbler	BTNW	5	1	0	2	0
Blue jay	BLJA	13	5	18	23	8
Blue-headed vireo	BHVI	22	11	22	17	1
Bobolink*	BOBO	40+	40+	40+	50+	60+
Brown thrasher	BRTH	0	0	0	0	1
Canada goose	CAGO	2	1	1	0	0
Cedar waxwing	CEWA	2	5	30	8	2
Chestnut-sided warbler	CSWA	5	4	0	2	0
Chipping sparrow	CHSP	6	13	21	50	4
Common grackle	COGR	0	0	0	0	1
Common loon*	COLO	1	1	0	0	1
Common raven	CORA	2	1	0	1	1
Common yellowthroat	COYE	2	1	3	1	1
Downy woodpecker	DOWO	0	0	0	0	1
Eastern bluebird	EABL	17	15	39	55	12
Eastern kingbird	EAKI	0	1	0	1	0
Eastern phoebe	EAPH	2	4	3	7	8
Eastern wood pewee	EWPE	0	2	0	0	0
Evening grosbeak	EVGR	0	0	0	0	1
Gray catbird	GRCA	0	0	0	1	0
Great blue heron	GBHE	0	1	1	0	4
Hairy woodpecker	HAWO	0	0	0	1	1
Hermit thrush	HETH	4	16	28	34	3
House finch	HOFI	0	1	0	0	0

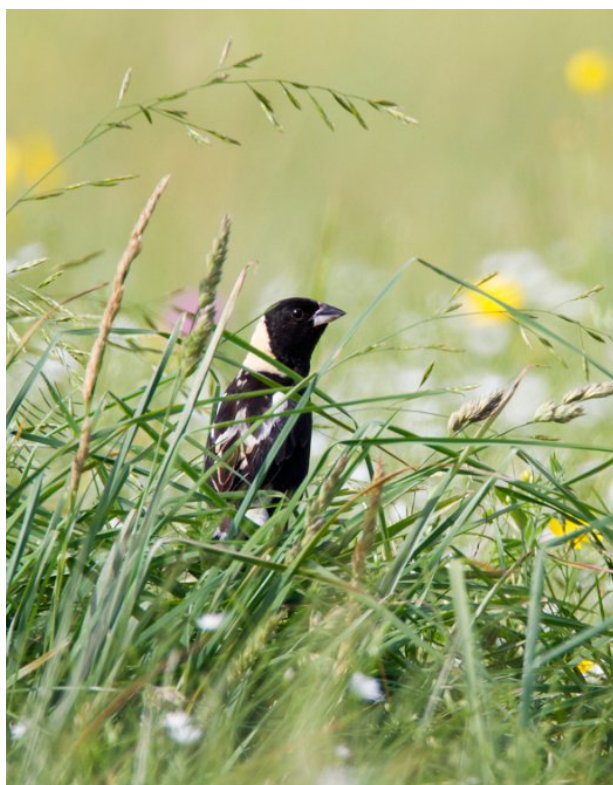
Common Name	AOU** code	2019	2020	2021	2022	2023
House wren	HOWR	0	0	0	1	0
Indigo bunting	INBU	0	8	9	16	0
Least flycatcher	LEFL	1	2	1	1	0
Mourning dove	MODO	0	1	0	0	0
Nashville warbler	NAWA	0	0	0	1	0
Northern cardinal	NOCA	0	0	0	0	1
Northern flicker	NOFL	10	12	3	14	4
Northern harrier*	NOHA	2	2	0	0	0
Northern parula	NOPA	0	1	0	1	0
Ovenbird	OVEN	26	17	15	38	11
Pileated woodpecker	PIWO	0	1	1	0	1
Purple finch	PUFI	3	0	2	2	2
Red-breasted nuthatch	RBNU	7	1	3	1	2
Red-eyed vireo	REVI	4	14	38	30	8
Red-tailed hawk	RTHA	1	0	0	0	0
Red-winged blackbird	RWBL	2	1	0	2	0
Rose-breasted grosbeak	RBGR	0	2	0	0	0
Ruby-throated hummingbird	RTHU	0	2	1	1	0
Ruffed grouse*	RUGR	0	0	0	9	0
Savannah sparrow	SAVS	40+	40+	40+	50+	80+
Scarlet tanager*	SCTA	1	0	1	0	0
Song sparrow	SOSP	15	19	48	60	11
Tree swallow	TRSW	8	13	34	64	13
Tufted titmouse	TUTI	0	0	0	0	1
Turkey vulture	TUVU	0	1	0	0	1
Veery	VEER	0	1	1	0	0
White-breasted nuthatch	WBNU	3	0	0	2	0
White-crowned sparrow	WCSP	0	0	0	1	0
White-throated sparrow	WTSP	0	1	0	0	0
Wild turkey	WITU	2	2	0	2	1
Winter wren	WIWR	0	4	0	0	0
Wood thrush*	WOTH	0	1	0	0	0
Yellow-bellied sapsucker	YBSA	10	2	11	3	4
Yellow-rumped warbler	YRWA	0	1	1	5	1

\* Considered Species of Greatest Conservation Need in New York State by NYS Department of Environmental Conservation. \*\* American Ornithological Union 4 letter codes.



### *Bobolink and Savannah Sparrow*

Visits were made to the site on 74 different dates between April 14th and Sept 2nd with the bulk of visits during the height of the season in June and July. As in past seasons, one of our primary aims was to determine the extent to which our findings from 2019 - 2022 were indicative of breeding activity in other years. The early part of 2019 was unusually cold and rainy while 2020 - 2022 were significantly warmer and drier by comparison; 2023 was a wetter year. In 2023, as in 2022, we believe similar or slightly higher numbers of individuals were present on the site. Counts of bobolinks in groups ranged from 1-2 individuals to more than 30 at the end of the breeding season when fledglings were also present.



Male bobolink; image: L. Master



### *Breeding Evidence and Chronology*

The observed chronology in 2023 was somewhat different from previous years, as was the mowing (Figure 2). Our earliest observations of fledglings were made on 23 June for bobolink, much earlier than 19 and 21 July for 2021 and 2022, respectively. Savannah sparrow, which nests earlier, was observed to have fledglings on 15 June this season, which was also earlier than the 7 July and 28 June dates from 2021 and 2022. Birds were observed to be carrying food (indicating that they are feeding young) on 19 June for bobolinks and 5 June for savannah sparrow; both dates are similar to those observed in 2021 and 2022. In contrast to the last few seasons when mowing occurred on or near 24 June, mowing began between 19-22 June in 2023, but stretched over several weeks with mowing on the main part of the large field beginning around 5 July. We are not certain when mowing was entirely completed but wet conditions resulted in a very long duration cutting period. Similar patterns were described by farmers in the Champlain, with some unable to complete first cuts of hay until August.

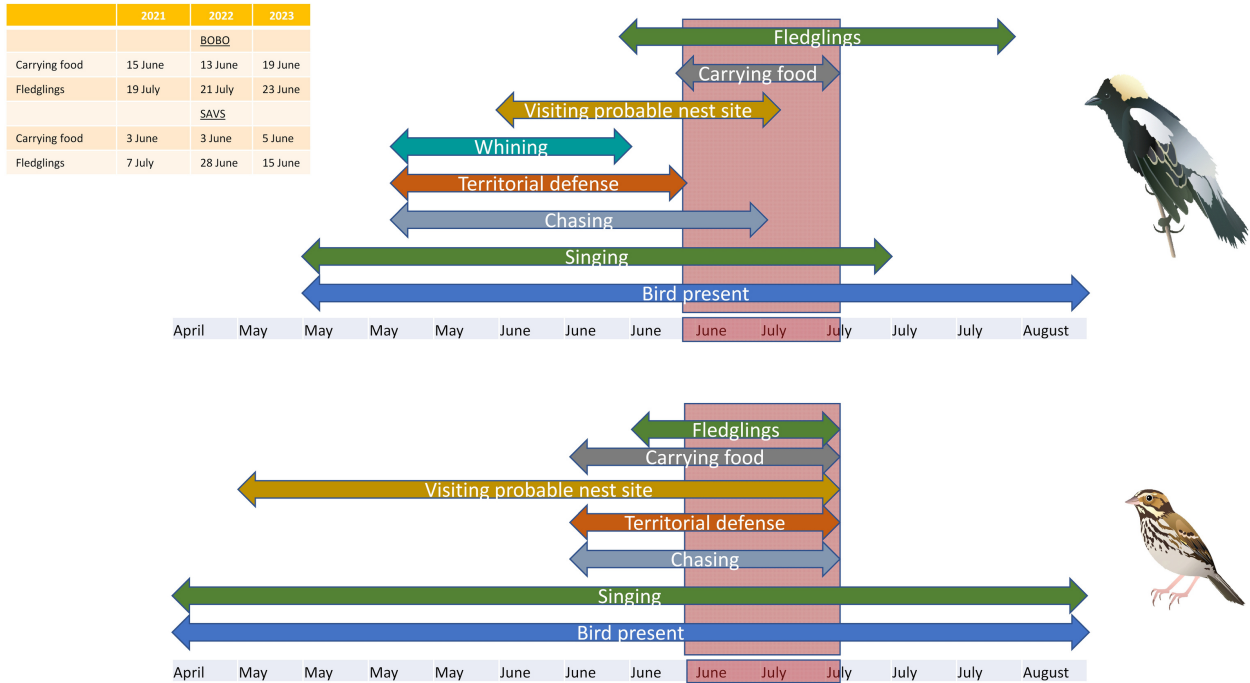


Figure 2. Chronology of bobolink and savannah sparrow breeding behavior observed at Heaven Hill Farm in Lake Placid, NY in 2023. Mowing (red box) extended over a longer period of time this season and later mowing in the big field was a benefit to birds.

These wet conditions, while normally a negative influence on nesting success, in the context of mowing benefited the birds significantly. We believe birds had high success this season and far fewer nests lost than in prior years. In relative terms, the bad weather (for farmers) is much less harmful to the birds than the mowing and so the bad hay year appears to have been a good one for bobolink and savannah sparrow.

### Thermal Drone Survey

Brendan Wiltse, Michale Glennon, Hyla Howe, Carli Courville, and Connor Vara met at Heaven Hill at 5am on 15 June to test the drone for a second time and determine if we could detect birds or nests by their thermal signature. This survey was 2 weeks earlier

than that of 2022 and we were able to detect at least one bird on a nest and also witnessed movements of a small mammal, potentially a chipmunk and possible nest predator, as it approached and then moved away from a nest. We had greater success at detecting what we strongly believe were birds on nests given the earlier date, shorter grass, and cooler conditions. However, we also uncovered additional challenges that are likely to prevent our widespread use of this method for nest detection in the future. One limitation is the battery life of the drone compared to the size of the area to be searched. Using two separate batteries, we were able to survey the area for more than an hour but still covered a relatively small portion of the entire set aside area and none of the area outside it. A second challenge is the volume of spatial data that results from

a high resolution survey such as this. Though it is theoretically possible to program the drone to fly a set survey pattern over the area and map all of it with the intent of later review for nest location identification, the storage and computer capacity requirements to do so are beyond anything reasonable in the scope of this project. High resolution is required to adequately identify nest locations and the resulting imagery and computing power for stitching images together and analyzing them are in the realm of projects generally undertaken by professional remote sensing labs. We believe the method holds promise and is capable of identifying nest locations; we hope that in the future it becomes more accessible to those without extensive remote sensing experience and/or funding for software and services.

### *Nest Box Monitoring*

Of the 15 boxes on site, during this season 7 were used by tree swallow ( $n = 5$ ) and bluebird ( $n = 2$ ). Of occupied boxes, 4 successfully fledged young, 2 of which were tree swallow and 2 were bluebird. Among the others, 3 boxes were abandoned at some point during the nesting cycle, 5 were never used, and for 2 boxes it was unclear whether young were successfully fledged or not. We found dead tree swallow nestlings in the one remaining box, possibly as a result of cold temperatures. In comparison to 2022, the proportion of boxes used was exactly the same, while overall success was higher and loss was lower than last year. This is not unexpected as birds gain experience with these still relatively new resources at Heaven Hill.



### *Essex County Comparative Study*

Analysis is currently underway for the point count data and interview transcripts. Hyla plans to run an occupancy model using the package RPresence in R to estimate the impacts of various landscape-level variables on bobolinks, savannah Sparrows, and Eastern meadowlarks. She is also developing a codebook based on the twenty interview transcripts and will establish inter-coder reliability to ensure that the analysis is robust enough to publish. She anticipates that the results will be shared at the conclusion of the Spring 2024 semester in a public thesis defense.

ArcGIS Pro was used to generate covariate data for the occupancy model, such as the mean elevation of each hayfield, and the percent of the surrounding landscape that is made up hayfield and pasture within 250-meter and 2.5-kilometer buffers of each point. She also used Planet imagery to remotely detect haying. This was challenging because poor air quality, rain, and general cloud cover obscured the satellite's view of



the ground on most days during the breeding season. However, she was able to monitor the changes between four reference periods (May 15 - May 30, June 1,2,&5, June 20 - 22, and July 4 - 5).

Hyla looks forward to sharing her results with both the Uihlein Foundation and the community in the coming months. When the date and location for the defense are set, we will share the invitation with the Uihlein Foundation and the local organizations and private landowners who contributed to this work. Additionally, Hyla will be presenting her research to the NYS DEC Grassland Bird Working Group on April 26, and in a public virtual presentation hosted by Green Mountain Audubon Society on March 21.

## Conclusions

The future of grassland bird nesting and population growth depends on open grassland and the majority of grassland habitat in the Adirondack Park is privately owned, providing opportunities for management but also challenges in the form of achieving economic returns on harvested hay while still allowing for breeding to occur in these fields. Best management practices for grassland birds are well documented (Atwood et al. 2017, Dechant et al. 1999, NRCS 1999, Ochterski 2006) and efforts have been made to implement many of these at Heaven Hill. Reducing the mowing encroachment in the conserved area, restricting cutting to specific zones, restricting use of the open field by people, dogs, or unauthorized vehicles, and providing signage to request that hikers stay out of

the open grassland during breeding season have all resulted in conservation gains for bobolink and savannah sparrow.

The primary remaining management lever that can be manipulated at Heaven Hill is the timing and extent of mowing, though this remains challenging at this site as it is throughout farm fields of the Northeast. This season saw an extended mowing period due to very wet conditions and resulted in delayed mowing of the large field at Heaven Hill to approximately 5-6 July. Ironically, the poor conditions for farmers this season benefited the birds by providing an additional week or more of time for nestlings to grow and fledge. Although wet, rainy conditions are also detrimental for birds during the nesting season, mowing represents a greater threat and the increased time period before mowing this season resulted in what we believe to be greater nest success and fewer losses. This sentiment was echoed by other farmers in the county who also had a challenging season. These economic impacts should not be minimized by any means, but this season's observations do provide evidence of the results that even small delays in mowing can accomplish with regard to nest success.

We appreciate the opportunity to work with the Uihlein Foundation again this season to document the use of Heaven Hill by grassland birds and other species. We appreciate the opportunity and inspiration that the Foundation's efforts have provided and hope you are as excited as we are that your actions to help these birds both at Heaven Hill and Uihlein Farm can be a model for other interested landowners in the Adirondacks.

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