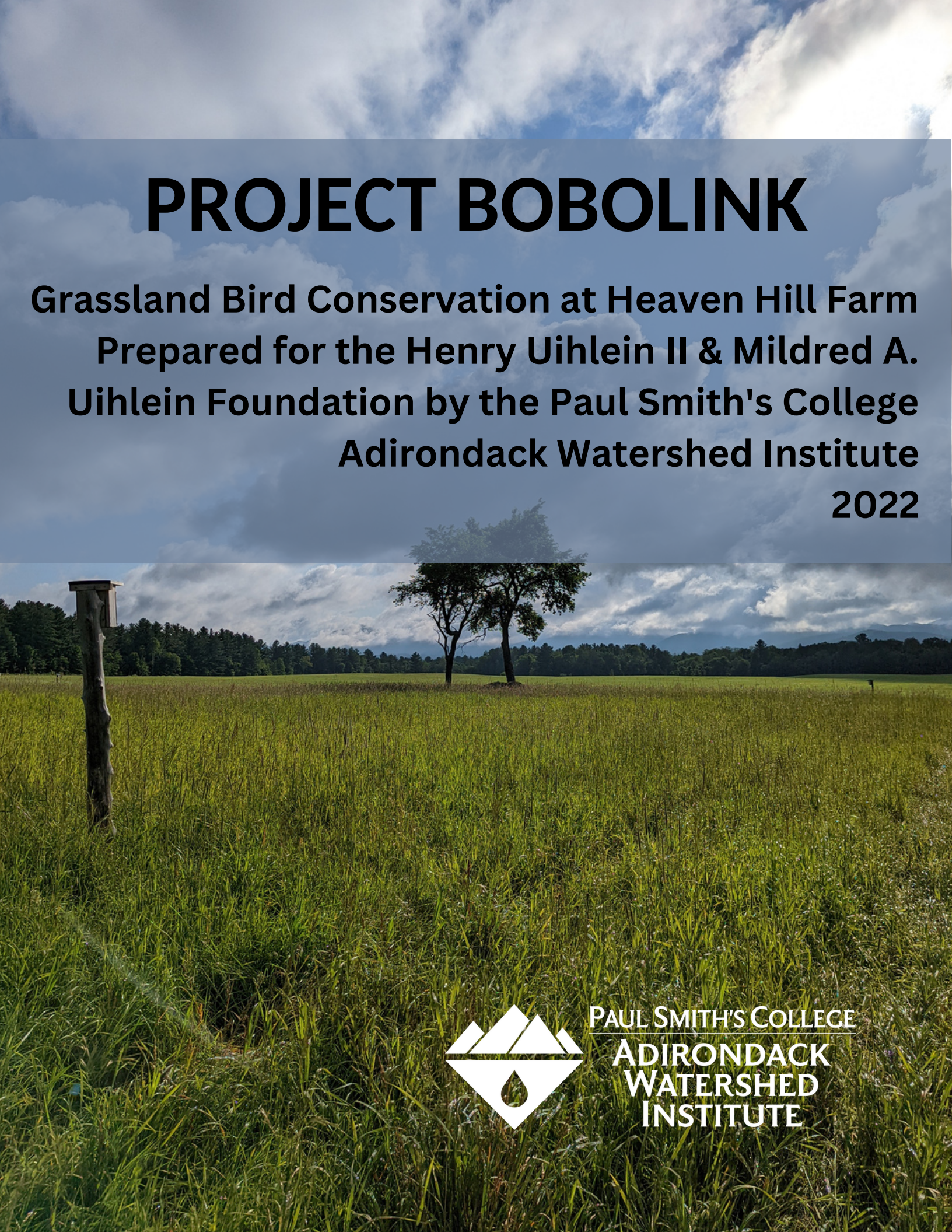
PROJECT BOBOLINK

Grassland Bird Conservation at Heaven Hill Farm

Prepared for the Henry Uihlein II & Mildred A. Uihlein Foundation by the Paul Smith's College Adirondack Watershed Institute

2022



PAUL SMITH'S COLLEGE
ADIRONDACK WATERSHED INSTITUTE

Project Bobolink

Grassland Bird Conservation at Heaven Hill Farm
2022 Report to the Uihlein Foundation

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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 contributed to our knowledge of the breeding chronology for bobolink and savannah sparrow at this site. We thank Derek Rogers of the Adirondack Land Trust, Neil Gifford and Tyler Briggs of the Albany Pine Bush Preserve, and Mark Brownlee and Rae Serfilippi of Archewild for visiting the site and providing knowledge and opinion on management options. We thank Jill Walker and Matt Roy of Northwood School for lending a thermal drone and assisting with its operation and we thank Brendan Wiltse of AWI for piloting it. As always, we greatly appreciate the assistance of Jim McKenna on any questions we posed and for the warm welcome to us each time we visited the property. We thank Larry Master for continuing to allow us to use his wonderful bird photos. We thank Northern New York Audubon for contributing to this project in numerous ways over the last few years. 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. 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.

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CONTENTS

Introduction

Each year, the North American Bird Conservation Initiative puts out a State of the Birds report describing the status of bird populations on the North American continent. This year's report is, in some ways, a response to the devastating findings of Rosenberg et al. (2019), work which shined a light on the loss of 3 million birds in North America since 1970. It reinforces those findings but also offers powerful examples of conservation success, whereby dedicated efforts have helped reverse declines in numerous species (North American Bird Conservation Initiative 2022). Grasslands in North America have experienced the biggest landbird declines in any habitat and the bobolink (Dolichonyx oryzivorus) is considered a Tipping Point species, one of a group of birds which 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). 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. The Paul Smith's College Adirondack Watershed Institute (AWI) has worked with the Henry Uihlein II and Mildred A. Uihlein Foundation since 2019 to address concerns related to grassland birds breeding at Heaven Hill and Uihlein Farm. This report describes our activities and findings during the 2022 season and provides recommendations for future work.

Methods

Ongoing: Breeding Chronology and Informal Observations of Other Species

In 2022, 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 conducted multiple times/week for a period of one to three hours each day throughout the breeding season and, 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, and data were collected via our Survey123 tool. The Survey123 app allows for input from any potential observer on site and we benefited from multiple surveys submitted by Ellen Jones on her visits to Heaven Hill.

Additional documentation of breeding chronology occurred association with Hyla Howe's graduate research. Over the course of the field season, 6 sites (Heaven Hill and the Tablelands, and four sites in the Champlain Valley) were wander-mapped 5 times each, and 30 point counts were conducted three times each. Wander mapping is a method often employed to map bird territories, allowing for estimation of density and territory size. Point count data are used for occupancy modeling, and will help us to understand which habitat factors are most important in determining breeding locations. Hyla's research will inform restoration efforts on fallow fields like the Tablelands, and will help Northern New York Audubon, the Adirondack Land Trust, and Cornell Cooperative Extension to make decisions about how to prioritize funding and outreach efforts for landowners.

Additional Activities: Thermal Drone Survey

We have benefited from meeting and collaborating with Northwood School professor Jill Walker during the course of our work at Heaven Hill and, as a result of that relationship, were able to make use of her thermal drone to pilot 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. Scheduling challenges and availability of a drone pilot prevented us from conducting this test as early in the season as we would have preferred but we believe it holds promise for identifying nest locations in the future.

Additional Activities: Next Box Monitoring

A total of 15 nest boxes were installed at Heaven Hill in 2021 around the perimeter of the set aside area. They were utilized immediately upon installation as perches by bobolink, savannah sparrow, and other species at Heaven Hill and in 2022 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, in particular, 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 every couple of days during the season.

Additional Activities: Proposed Recreation Trail

In 2021, using equipment available to us from prior projects, we deployed 8 Bushnell trail cameras along the proposed recreation route to collect information on mammals present in the area. We did not have enough staff capacity to dedicate additional field time to the recreation trail during summer 2022, but cameras remained deployed through the winter of 2021/22 and were left on site until September 2022. No formal analyses of these data have been conducted but we reviewed photos to provide documentation of mammals detected in this area.

Findings

Overall Bird Species Richness and Relative Abundance

Informal observations of birds were made approximately every other day throughout the breeding season by AWI and additional visits by Ellen Jones. We detected a total of 46 species through the course of the season, representing all birds that were detectable by ear or sight from our location on the property (Table 1). The diversity of species was similar to 2019 - 2021, with the addition of 6 species new to our records at the site – gray catbird, hairy woodpecker, house wren, Nashville warbler, ruffed grouse, and white-crowned sparrow. It is important to note that the use of the smartphone app for data collection has most likely increased our observations for some species in the last 2 seasons due to both ease of use and to observations provided by outside observers.

Table 1. Bird detections at Heaven Hill Farm during May - August

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

Table 1. continued

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

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

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.

Bobolink and Savannah Sparrow

Visits were made to the site on 68 different dates between April 24th and August 3rd 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 - 2021 were indicative of breeding activity in other years. The early part of 2019 was unusually cold and rainy while 2020 and 2021 were significantly warmer and drier by comparison. In 2022, as in 2021, we believe similar or slightly higher numbers of individuals were present on the site. Bobolink was observed on 77% of our visits to Heaven Hill and savannah sparrow on 96%; counts of bobolinks in groups ranged from 1-2 individuals to more than 20 at the end of the breeding season when fledglings were also present.

Northern flicker with young; image: L. Master

Breeding Evidence and Chronology

The observed chronology in 2022 was similar to 2020 and 2021 (Figure 1).Our earliest observations of fledglings were made on 21 July for bobolink, similar to a date of 19 July for 2021. Savannah sparrow, which nests earlier, was observed to have fledglings on 28 June this season, which was a full week earlier than the 7 July date from 2021. Birds were observed to be carrying food (indicating that they are feeding young) on 13 June for bobolinks (compared to 15 June in 2021) and 3 June for savannah sparrow (same date in 2021). Conditions appear to have been slightly better than 2020 and similar to 2021, and we observed significant numbers of fledglings on site, especially at the end of the season when territories break down and birds gather in groups in preparation for migration. Some of this may, again, be attributable to increased observation power both because we have more experience with documenting these behaviors, and because we were able to share our survey and collect information from additional observers. However, it appears that 2022 was again a good year and we can say unequivocally that both species nested successfully at Heaven Hill.

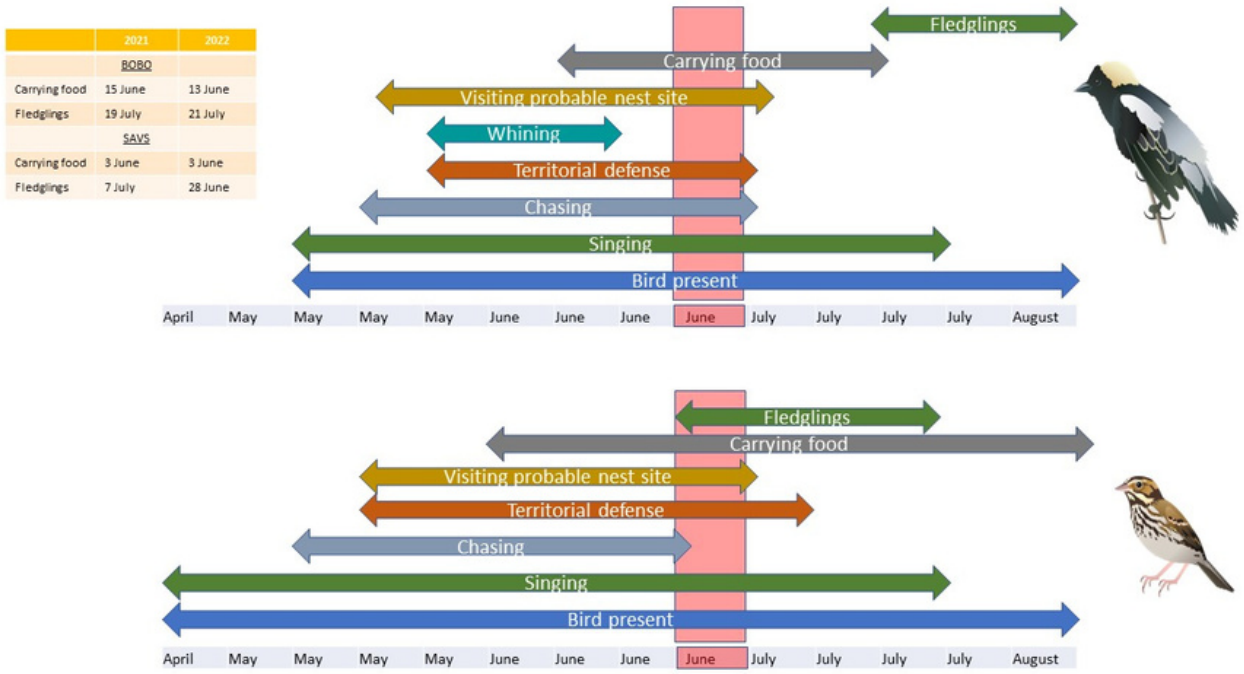

Figure 1. Generalized chronology of bobolink and savannah sparrow breeding behavior observed at Heaven Hill Farm in Lake Placid, NY and critical dates 2021-2022. Mowing occurs on or around 24 June in most years.

Space Use

In contrast to 2019 but similar to 2020 and 2021, we observed bobolinks regularly throughout nearly all areas of the open fields at Heaven Hill in 2022.The area of the most intense use remains similar to past years, and that is partially located within the set aside where there are numerous perches in the form of rocks, shrubs, and a handful of small trees from which these birds prefer to sing and observe their surroundings.

Based on our observations over the last few years and the spatial constraints of the site, we believe we are probably observing the majority of birds that are using Heaven Hill. We suspect that there are a core number of prime territories in the set aside area and that those territories are probably smaller because this is the area of highest habitat quality.

Figure 2. Conceptual diagram of possible distribution of bobolink territories at Heaven Hill, accounting for edge avoidance and higher habitat quality (therefore smaller territory size) in the set aside area. Actual edge avoidance distance is unknown but is represented in illustrated buffers of 25 and 100m.

Outside of the set aside core area, there are likely a number of additional territories that are larger and occupied by subdominant males (Figure 2). Because bobolinks have a social structure whereby males are paired with multiple females, not all of these theoretical territories may be occupied by different individuals. Our field observations to date suggest that if we are observing as many as 12 males on a given occasion, and as many as 20-30 individuals (males and females plus offspring) at the end of the season, it is likely that we are seeing most of the birds on the site and the site is probably supporting as many birds as it is likely to support. This is largely by virtue of the size of the field and the surrounding landscape context (i.e., forest). As management actions in the open field habitat continue to enhance reproductive output for bobolink, it is likely that there will be surplus individuals who return annually and who may eventually find their way across the road to Uihlein Farm.

Response to Mowing

As in past years, mowing of the first cut appears to have begun on 24 June, a timing which coincides with the presence of active nests. The most commonly observed reactions to mowing documented in past years were agitated birds, birds feeding in the recently mowed areas, and the presence of crows or other scavengers. This year, we observed fewer instances of agitated birds reacting the mowing. This may be due to the fact that birds were farther along in their nesting and there was less risk to active nests, or that the majority of nests were located in the set aside and relatively fewer birds were at risk in the mowed area.

We are uncertain of the reason but noted that the response to mowing this season was more muted than in 2020 or 2021. We also noted that the mowing did not extend to the full area beyond the set aside to the south that is normally mowed. We are uncertain why this area was not completely mowed but it may also have contributed to additional protection for any birds using that area.

Thermal Drone Survey

Jill Walker, Matt Roy, Brendan Wiltse, and Michale Glennon met at Heaven Hill at 6am on 30 June to test the drone and determine if we could detect birds or nests by their thermal signature. Matt and Brendan are both drone pilots and Matt provided an introduction to the specific drone model, after which Brendan piloted it for approximately 30 minutes in a variety of flight patterns primarily over the set aside area.

We did not detect and birds incubating nests but were able to detect individual birds sitting on top of the vegetation (Figure 3). Prior field observations combined with the late date suggested to us that birds were likely to be beyond the incubation stage at that point and that it was more likely that young had hatched and were at varying stages of being fed and moving around the nest area, making it much more difficult to detect a heat signature. In addition, the grass inside the set aside area at that time was very tall (the area outside had already been mowed) which also made detection of birds at ground level difficult.

We believe that future efforts should be aligned with field observations as closely as possible and timed to occur when it is most likely that birds are incubating. These conditions, as well as planning for an evening or very early morning survey when the contrast between birds and the ambient temperature will be highest, hold promise for detecting nests in the future. Detected nests could be mapped and inform any proposed alterations to mowing activities.

Figure 3. Pilot testing of MAVIC thermal drone at Heaven Hill 30 June 2022. Left panel shows bobolink flushed by drone.

Next Box Monitoring

Of the 15 boxes on site, 7 were used by tree swallow (n = 4) and bluebird (n = 3). Of occupied boxes, box 2, which was used by tree swallow, fledged at least 4 young (Figure 3). Among the others, 3 boxes were abandoned at some point during the nesting cycle. Birds are known to start nests and never finish constructing them, and on some occasions, nests are abandoned at the egg laying stage. This is a common occurrence and is considered a nest failure. It may be more common in younger, inexperienced birds. The remaining 3 occupied boxes were observed to have dead hatchlings present on approximately 6/26-6/28, with the prior nest check occurring on 6/20. Two of these were tree swallow and the other bluebird. Temps reached lows of 39, 33, and 40, on June 19, 20, and 21 and 1.6 in of rain fell on 6/27. It is likely that some combination of cold temperatures and rain caused the loss of these nests.

Proposed Recreation Trail

No formal analyses of data from trail cameras was conducted but we have continued to review photos to provide documentation of mammals detected in this area (Table 2).

Table 2. Bird and mammal species detected on proposed recreation trail route at Heaven Hill Farm during 2021-2022.

Order	Common name	Scientific Name
Birds	American robin	*Turdus migratorius*
	American woodcock	*Scolopax minor*
	Barred owl	*Strix varia*
	Blue jay	*Cyanocitta cristata*
	Dark-eyed junco	*Junco hyemalis*
	Hermit thrush	*Catharus guttatus*
	Northern flicker	*Colaptes auratus*
	Ruffed grouse	*Bonasa umbellus*
	White-breasted nuthatch	*Sitta carolinensis*
	Wild turkey	*Meleagris gallopavo*
Mammals	American black bear	*Ursus americanus*
	American marten	*Martes americana*
	Bobcat	*Lynx rufus*
	Coyote	*Canis latrans*
	Deermouse	*Peromyscus spp (maniculatus or leucopus)*
	Eastern chipmunk	*Tamias striatus*
	Eastern gray squirrel	*Sciurus carolinensis*
	Fisher	*Pekania pennanti*
	Flying squirrel	*Glacomys spp (sabrinus or volans)*
	Gray fox	*Urocyon cinereoargenteus*
	North American porcupine	*Erethizon dorsatum*
	North American red squirrel	*Tamiasciurus hudsonicus*
	Raccoon	*Procyon lotor*
	Red fox	*Vulpes vulpes*
	Snowshoe hare	*Lepus americanus*
	White-tailed deer	*Odocoileus virginianus*

Recommendations

Grassland Birds

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 into the set aside area, restricting cutting to previously identified 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 the breeding season have all resulted in conservation gains for bobolink and savannah sparrow.

Savannah sparrow; image: C. Vara

The primary remaining conservation lever that can be manipulated at Heaven Hill is the timing and extent of mowing, though this remains challenging at this site for the same reason it is challenging throughout farm fields of the Northeast. We believe that targeting our most intense field observations to the time when birds are observed to be feeding young and approaching fledging will continue to help us identify critical time periods and that this information can provide support for any argument made on behalf of restricting of mowing activities. Additionally, should thermal drone surveys prove useful for identifying locations of nesting birds, this method provides an additional opportunity to inform potential mowing restrictions under consideration.

Recreation Trail

At this time, we cannot make additional recommendations on the proposed recreation trail but reiterate our suggestion that the Foundation assess the possible benefits and costs of not building the trail and that, in your assessment, the unique features, richness of species, and high ecological integrity of the broader landscape in which the proposed trail is located are important considerations.

Conclusions

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. Conditions during this breeding season were warmer and drier throughout than they were in 2019 and similar to 2020 and 2021. As in 2021, we were able to document numerous breeding behaviors and observe multiple fledglings of both target species at the end of the season and believe both produced several successful nests in 2022.

The 2022 season also marked the first year of graduate work by Hyla Howe focused on grassland birds and using Heaven Hill as a benchmark and demonstration site for other landowners in Essex County. Hyla has established important relationships with landowners (including former NYS governor George Pataki) and is engaging them in management discussions for grassland birds, using Heaven Hill as an important 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 at essentially the same time each season.

This presents a unique opportunity to compare the breeding chronology in this site to the more variable conditions at lower elevations that most birds must contend with.

Hyla's work at Heaven Hill is also leading to important community partnerships. In the summer of 2022, Northern New York Audubon launched a Farm Grant program, which is providing funding and education to farmers so that they can improve habitat for birds on their farms. Through the grant, Hyla has interacted with more than 40 farmers, hosted two public fundraising and outreach events and three informational zoom sessions, spent time in the field with ecologists from Audubon Vermont, and networked with conservation organizations that are active in avian conservation on working lands around the country. Hyla has worked closely with Carly Summers of the Essex County Cornell Ag Extension Unit, and Derek Rogers, who are working on parallel initiatives within their organizations that contribute to on-the-ground conservation work and public and landowner awareness. Hyla also partnered with BikeADK and DaCy Meadow Farm in the summer of 2022 to lead a Grassland Bird Bike Ride.

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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