



Wisconsin Kirtland's Warbler 2017 Nesting Season Report

The 2017 Kirtland's warbler nesting season marked the 10th year of Kirtland's documentation and subsequent monitoring in Wisconsin. From only 11 Kirtland's and three nests found in Adams County in 2007 to 53 individuals and 20 total nests among Adams, Marinette and Bayfield counties in 2017, the population has grown and geographically expanded in our decade of conservation work. Kirtland's are responding to the efforts from dedicated partners and the numbers of individuals and nests in Wisconsin continue to increase.

On May 15, 2017, the first Kirtland's of the season was detected at the Adams County site by Ashley Hannah (UW-Madison) and Barry Benson (USDA-APHIS). Over the course of the week more Kirtland's were found and most of the color-banded males occupied territories that they held in previous years. This year, many returning males were unbanded. This may indicate a change in population structure with older males dying and younger males occupying the majority of the male age-structure in the population. It may also indicate an increase in fledgling success since 2015, with more birds returning to the site to breed.

We were pleased that male AOJR (color-bands Aluminum, Orange, Black, Red), the oldest known male in Wisconsin at eight years of age, returned to nest this year. AOJR has made eight trips from Wisconsin to the Bahamas and back, totaling approximately 12,000 miles. The oldest Kirtland's on record is a male that was color-banded in Michigan and resighted, aged to be 11 years old.

This season we welcomed three enthusiastic and hard-working site monitors, Anna Jocham for Adams County, Lake White for Marinette County, and Mike Peczynski for Vilas and Bayfield counties. Other season highlights include three field trips for the public, habitat management projects in Marinette County, scientific research at the Adams County site, the continuation of projects such as adult and nestling banding, the continuation of the state-wide census, new and returning partnerships, and steadfast public interest and support in seeing the success of the Kirtland's warbler. In addition, the 2017 season was the third year in which we detected nesting in Adams County outside of the core breeding area.

This year the core breeding site in Adams County, part of a WDNR easement for Kirtland's warblers, was sold by Timberland Investment Resources and purchased by Sand Valley Restoration LLC. We look forward to working with our new partners and are appreciative of their interest in Kirtland's warbler conservation.

We are pleased to continue working on Kirtland's conservation with the University of Wisconsin, the USFWS Partners Program, Wisconsin Natural Resources Foundation, USDA Wildlife Services, and multiple county forests. Please enjoy the following report with more details of the 2017 Kirtland's breeding season.

Kirtland's Warbler Season Summary

- 20 males and 16 females were confirmed in Adams County, 7 males and 4 females in Marinette County, 3 males in Bayfield County, 3 males in Vilas County.
- 20 total nests: 16 nests by 15 pairs in Adams County, 4 nests by 4 pairs in Marinette County, 0 nests in Bayfield and in Vilas counties.
- 15 successful nests: 12 in Adams County, 3 in Marinette County.
- 5 nests failed: 4 in Adams County (2 cowbird parasitism, 2 unknown) 1 in Marinette County (depredation).
- A minimum of 49-63 young fledged: 38-48 in Adams County, 11-15 in Marinette County.



Anna Jocham and Lake White, site monitors during the 2017 season, release Kirtland's warblers after the banding crew color-banded two adults, Adams and Marinette counties. *Photo courtesy of Joel Trick, 2017.*

Kirtland's Warbler Data for Adams County, 2007-2017

Includes number of color-banded males confirmed, number of females, number of nesting attempts, successful nests (determined if nestlings fledge the nest), and an estimated number of fledglings.

<i>Year</i>	<i>Number of Color-banded Males</i>	<i>Number of Females</i>	<i>Number of Nesting Attempts</i>	<i>Successful Nests</i>	<i>Estimated Fledged</i>
2007	8	3	3	unknown	unknown
2008	7	5	5	2 (40%)	10
2009	10	10	10	6-7 (60—70%)	23—27
2010	20	11	16	3-5 (19—31%)	12—18
2011	20	11	11	4 (36%)	9—17
2012	20	10	14	4 (29%)	8—13
2013	16	9	12	4 (33%)	13
2014	11	7	8	3 (38%)	8—10
2015	15	14	15	12 (80%)	34—51
2016	18	13	17	7 (41%)	22—23
2017	20	15	16	12 (75%)	38—48

Kirtland's Warbler Data for Marinette County, 2008-2017

Data in the table include the number of color-banded males confirmed, number of females, number of nesting attempts, successful nests (determined if nestlings fledged the nest), and an estimated number of fledglings. 2008 was the first year monitoring occurred for Kirtland's in Marinette County. The first confirmed breeding (nest was found and monitored until nestlings fledged) occurred in 2009.

Year	Number of Color-banded Males	Number of Females	Number of Nesting	Successful Nests	Estimated Fledged
2008	2	1	-	-	-
2009	2	2	1	1	3
2010	2	1	-	-	-
2011	1	-	-	-	-
2012	3	-	-	-	-
2013	2	1	1	-	-
2014	1	-	-	-	-
2015	3	1	1	1	2
2016	6	3	3	2	10
2017	7	4	4	3	11-15



Sarah Warner (USFWS) holds a male Kirtland's warbler that was recently color-banded, Adams County, 2017. This male was aged to be After Second Year (ASY) based on certain plumage characteristics. *Photo Courtesy of Joel Trick.*

Kirtland's Warbler Observations for Bayfield, Douglas, and Vilas Counties, 2008-2017

Kirtland's warblers have been detected in widespread parts of Wisconsin in suitable nesting habitat that are outside of Adams and Marinette counties. As we celebrate a decade of monitoring in Wisconsin, we provide a brief history of observations from other counties with confirmed Kirtland's warblers.

Bayfield County (*Due to the close proximity of the Bayfield and Douglas sites, we are uncertain if they can be classified as two separate breeding sites. Continued monitoring is needed to determine this.*)

- 2008-2009: Kirtland's found during both years.
- 2010: Early June, two males and one female Kirtland's were located in Bayfield County Forest.
- 2011: May 20, a single Kirtland's warbler was found on Bayfield County Forest. Subsequent site visits failed to relocate this male. This is the same site where a single male was found in 2010.
- 2012: May 26, a single Kirtland's warbler male was found on Bayfield County Forest and subsequently color-banded. This bird was observed one month later in Adams County at the core site, traveling 175 miles from where it was banded.
- 2013: One unbanded male was detected. This record is unconfirmed.
- 2014: One male was detected.
- 2015: Two singing males detected.
- 2016: Three males and one female detected (1 pair confirmed). First nest found containing 5 nestlings that were color-banded and fledged successfully.
- 2017: Three males detected, including 1 of the 2016 banded nestlings.



An unbanded male Kirtland's Warbler, 2017, Vilas County.
Photo Courtesy of Mike Peczynski

Douglas County

- 2008-2009: Kirtland's found during both years.
- 2010: In early June, a single male Kirtland's was found in Douglas County on the same day Kirtland's were found in Bayfield in 2010.
- 2011: June 9, a single Kirtland's warbler was found and subsequently color-banded. This male was approximately 6 miles away from where a single male was found in Bayfield the same year.
- 2012: June 2-9, three males were observed at several locations in Douglas County, including the site where a male was banded in 2011. These birds were seen at three sites within three miles of each other. The males were not seen again during the season after June 12.
- 2013 and 2014: One male was found in Douglas County.
- 2015-2016: No Kirtland's were found.
- 2017: No surveys conducted.

Vilas County

- 2008-2009: Kirtland's were found at the site but not confirmed.
- 2011: May 25, a female Kirtland's was found and not detected again during the season.
- 2012: May 24 and 25, a single Kirtland's male was found. Despite subsequent efforts, the male was not detected again during the season.
- 2016: One male Kirtland's was detected.
- 2017: Three males were detected.

Kirtland's Warbler 2017 State-wide Census Summary

- Census period: June 6-20.
- 11 Volunteers and 4 staff surveyed 47 stands in 5 Wisconsin counties (Figure 1).
- Bayfield County (6 stands), Vilas County (5 stands), Marinette County (13 stands), Jackson County (2 stands), Adams County (21 stands).
- 31 singing males were detected during the census period (Figures 1, 2).
- 11 singing males recorded in northern counties: 1 in Vilas County, 3 in Bayfield County, 7 in Marinette County.
- 20 singing males recorded at the Adams County breeding site.
- 1 additional male was found in Vilas County after the Census period ended.

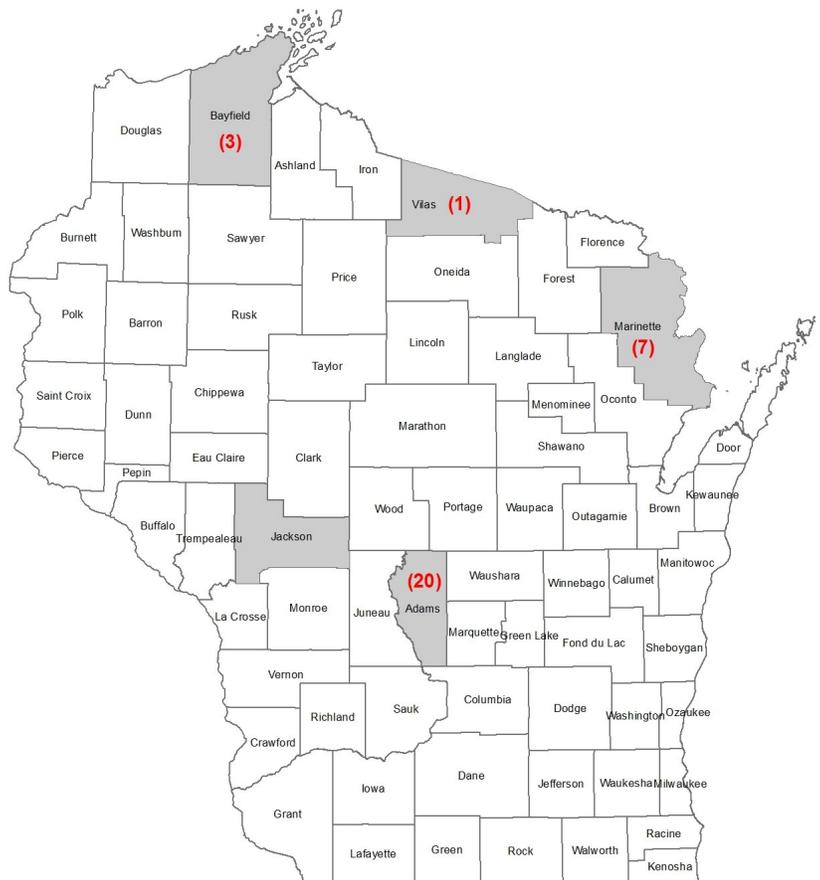
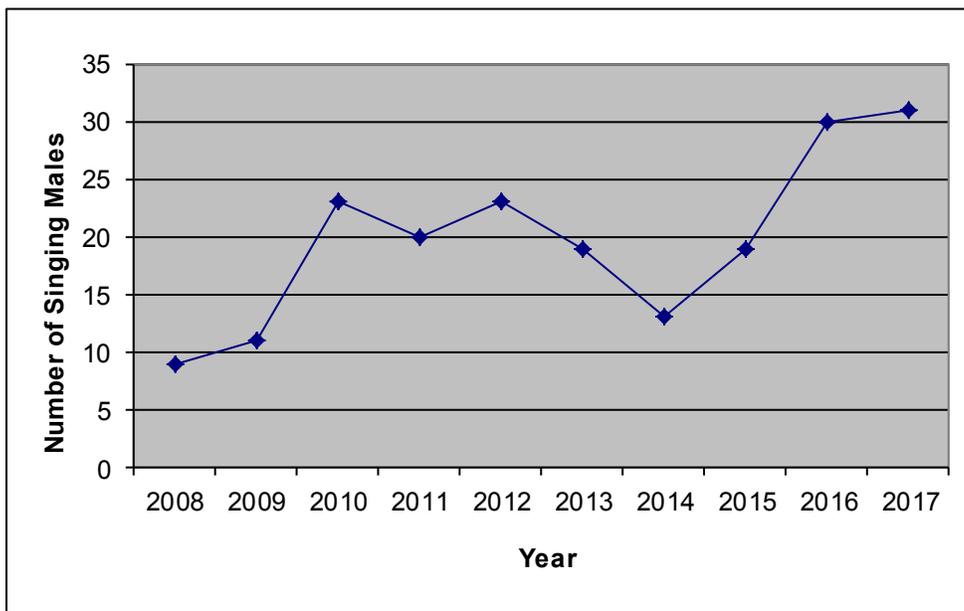


Figure 1. Kirtland's Census Locations by County with Number of Singing Males.

Figure 2. Singing males recorded during the Wisconsin census 2008-2017. In 2007, 8 males were documented at the Adams site, but a statewide census was not conducted that year.



Kirtland's Warbler Adult and Nestling Banding Summary

- A total of 45 Kirtland's were color-banded in 2017.
- 15 adult males and 1 female were captured and color-banded in 2017: 8 males and 1 female in Adams County, 5 males in Marinette County, 2 males in Bayfield County.
- Of the newly color-banded birds, 10 were aged to be second-year (SY), 2 were aged to be after-second-year (ASY), and 4 could only be determined to be after-hatch-year (AHY, a broader category that includes SY and ASY).
- 29 nestlings were color-banded in 2017 from 6 separate nests and all are believed to have fledged successfully.
- A previously banded male who had lost a color band was recaptured in Adams County to verify his identity and replace the missing color band. This bird was banded in Adams County in 2010, and had hatched in 2009. He is now 8 years old, becoming the oldest known Kirtland's warbler in Wisconsin.



Top: Sarah Warner (USFWS) holds a male Kirtland's warbler that was recently color-banded, Adams County, 2017. *Photo Courtesy of Joel Trick.*

- A Kirtland's who was banded in 2016 with an aluminum band was recaptured in Bayfield County to determine his identity and give him a set of color-bands. Once identified, it was discovered that he had set up a 2017 territory only 145 meters (159 yards) from where he had hatched (and was banded) in 2016. His 2017 territory was adjacent to his father's 2017 territory.

- ABPI (color-bands Aluminum, Blue, Purple, Indigo) was banded as a nestling in 2014 at the Adams County site. This male was subsequently seen by Ashley Hannah and Nathan Cooper (Smithsonian Institute) in the Bahamas in 2015: see 2015 update: <https://www.fws.gov/midwest/GreenBay/endangered/kiwa/Updates.html>. ABPI was not found in 2016, but was back nesting at the Adams County site in 2017.

- The Kirtland's warbler nestling banding project started in 2014 and we are now seeing robust first-year survival and strong natal site fidelity. Although a small sample size, this is indicated by the returning 4 Adams County 2016 nestlings and 1 Bayfield County 2016 nestling.

- Based on nestling return data, there is a 26.7% return rate for Adams County and 20% for Bayfield County. This is based on resight data on color-banded nestlings that return the next year to breed, in addition to a recapture of a nestling in Bayfield County.



Joel Trick and Ron Refsnider determine the age of a recently color-banded male Kirtland's warbler based on feather details, Adams County. *Photo Courtesy of Sarah Warner.*

Kirtland's Warbler Playback Experiment 2014-2016 Results

- Audio playbacks were used for 2 years (2014-2016) at 2 northern Wisconsin locations (Bayfield County Forest and Marinette County Forest) to test if playing the Kirtland's song would attract males to new sites. In 2017, a playback unit was established in Vilas County.
- Playbacks were used at sites that have received intermittent singing male and female observations between 2010 and 2017.
- During the years of the playback use, Kirtland's were detected at all three sites.
- There was one nest confirmed in 2016 at the Bayfield County Forest playback site. This was the first known nest in this county.
- There were five nests confirmed at the playback sites in Marinette County. There had been previous nests found at the Marinette County site in 2009 and 2013.
- No nests were detected at the Vilas playback site in 2017. To date, there has not been confirmed nesting in Vilas County.
- The study suggests that playbacks could be used to establish additional populations in the remaining areas of Wisconsin with suitable habitat and elsewhere where habitat exists.
- We thank Mike Ward, Illinois Natural History Survey University of IL, for leading this project.
- Please contact Nick Anich for the full text of the publication: Nicholas.Anich@wisconsin.gov



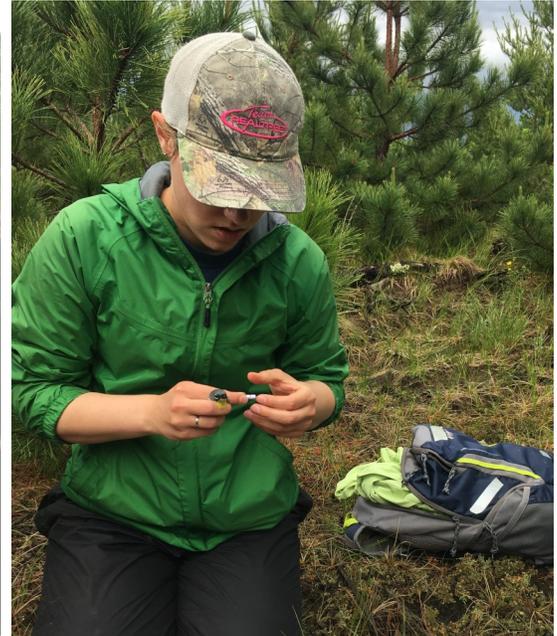
Playback unit and battery used in northern Wisconsin. Playback units broadcast the Kirtland's warbler song and are set on a timer to play at various times during the day for a certain duration of time. Playback units were checked twice a week by a field crew. *Photo Courtesy of Nick Anich (WDNR)*



USDA Wildlife Services cowbird trap in Adams County, 2017. *Photo Courtesy of Barry Benson (USDA).*

Adams County Cowbird Trapping Summary

- Cowbirds traps are operated and managed by Wildlife Specialist Barry Benson, USDA Wildlife Services APHIS.
 - 4 traps were placed at the Adams County breeding site for 11 weeks.
 - Traps were placed at the site on April 19 and were within 0.5 miles from the closest Kirtland's warbler core territory.
 - 240 cowbirds were captured (168 males, 48 females, 24 juveniles).
- For comparison, a total of 266 cowbirds were caught in 2016, 363 in 2015, 110 in 2014, 207 in 2013, 216 in 2012, 166 in 2011, 216 in 2010, and in 2009 a total of 303 cowbirds were caught.
 - Cowbird parasitism has not been observed at the northern sites; therefore, cowbird traps are not necessary in these areas.



Left: Trina Soyk (USFWS) records data while Joel Trick watches a mist-net closely for a Kirtland's warbler, Marinette County. Right: Ashley Hannah (UW-Madison) holds a recently color-banded male Kirtland's warbler. Ashley configures a radio transmitter to this adult male in order to determine the dimensions of the transmitter that will fit nestlings. *Photo Courtesy of Sarah Warner (USFWS)*

Kirtland's Warbler Field Trips

- 3 field trips to the Adams County site were offered in 2017.
- 1 on May 19 (43 people) and 1 on May 24 (8 people) through the Natural Resources Foundation of Wisconsin.
- 1 on May 25 (15 people) for the New Jersey Audubon Eco-Center Birding in the land of Leopold trip.
- The field trips were attended by a combined total of approximately 66 people.
- The field trips raised funds (approximately \$2000) that will be used for Kirtland's warbler conservation in Wisconsin.
- Past funds have been used to support the Adams County and Marinette County monitoring crews, an essential part of the Wisconsin Kirtland's warbler project.

Kirtland's Warbler Habitat Management in 2017

- Douglas County: Wisconsin DNR planted a 125 acre jack pine stand near the Brule River.
- Bayfield County: Bayfield County Forest continues to implement its Barnes Barrens Management Plan, rotating stands to ensure various ages of pine and open barrens are present on the landscape at all times (please see video link for more details).
- Marinette County: Marinette County Forest continues to implement its Kirtland's Warbler Habitat Management Plan and is active in research to investigate methods for enhancing understory and nesting habitat. This work is partially funded by FWS Partners for Fish and Wildlife Program.

University of Wisconsin-Madison, Kirtland's Warbler Research in Adams County, Conducted by Graduate Student Ashley Hannah

Kirtland's Warbler Nest Cameras

- Purpose of Study: To identify what predators depredate Kirtland's warbler nests at the Adams County core breeding site.
- 7 cameras were deployed on 7 nests in 2017.
- Two videos showed forced fledging of nestlings from two nests by a chipmunk and likely a shrew or small mouse.
- All videos will be reviewed this winter and data will be used to help guide management decisions and actions.

Kirtland's Fledgling Tracking

- Purpose of Study: To determine habitat use of juvenile Kirtland's warblers.
- 6 transmitters were attached to 6 nestlings in 2017 (one nestling each from 6 nests).
- All broods were color-banded, including nestlings with the transmitters.
- Fledglings were tracked from 5-40+ days post-fledging.
- In 2017, 5 fledglings survived 30+ days out of the nest and reached independence from their parents on average at 41.6 days after hatching.
- Preliminary data suggest that nestling use areas are larger than adult male territories.
- Nestlings use areas with greater tree densities than control areas.
- More data will be analyzed this winter and results will provide information on the habitat needs for juveniles and will guide habitat management actions.



Kirtland's warbler nestling (top photo) and fledgling (bottom photo) with a radio transmitter, Adams County. Transmitters are placed on 5-6 day-old nestlings. When the nestlings leave the nest, they are tracked and monitored by Ashley Hannah (UW-Madison). *Photos Courtesy of Ashley Hannah, 2017.*



Nest-site Vegetation Analysis

- Purpose of Study: To determine the micro and macro habitat features important for nesting sites and territory selection.
- Vegetation type, height, and density were collected at all nest sites (micro habitat), within territories (macro habitat), in unoccupied areas, and at juvenile locations in Adams County.
- This winter data will be analyzed and comparisons will be made between successful and unsuccessful nests, territories and unused areas, and between juvenile use and non-use areas.
- This study will inform habitat needs for nesting Kirtland's warblers and will help determine habitat management decisions, particularly pertaining to red-pine dominated habitat.

Acknowledgements for the 2017 Kirtland's Warbler Nesting Season

The Kirtland's Warbler 2017 partnership includes the Wisconsin Department of Natural Resources (Kim Grveles, Nick Anich, Davin Lopez, Richard Staffen, Amy Staffen, Aaron McCullough, Caroline Ward, Jon Robaidek, Robert Hansen, Michele Woodford, Jill Nemecek, Mark Braasch, nest monitors Lake White, Anna Jocham, Mike Peczynski); U.S. Fish and Wildlife Service (Sarah Warner, Trina Soyk, Jeff Hemming, and retired biologists Joel Trick and Ron Refsnider); U.S. Fish and Wildlife Service Partners Program (Gary VanVreede and Mark Pfof); U.S. Department of Agriculture Wildlife Services (Barry Benson); Property Owners are Sand Valley Restoration LLC, Meteor Timber, Wisconsin Trapshooting Association, and Jackson, Marinette, Bayfield, Douglas, and Vilas County Forests; Vilas County Forest (Jeremiah Oftedahl), University of Wisconsin (Ashley Hannah and Dr. Anna Pidgeon); and many volunteers. The information in this report was compiled and written by Sarah Warner, graphs and figures were made by Rich Staffen and Kim Grveles, data were provided by nest monitoring, surveys, and banding efforts.

There are many enthusiastic and dedicated partners that we wish to thank for making the season such a success. We are grateful for the efforts from the following collaborators:

Sand Valley Restoration LLC allowed us to use their lands to conduct monitoring, banding and cowbird trapping. Meteor Timber and Wisconsin Trapshooting Association supported monitoring activities on their properties. Bayfield and Marinette County Forests continue to be extremely supportive by developing plans for the management of Kirtland's habitat and conducting habitat improvement projects.

The U.S. Department of Agriculture (USDA) Wildlife Services managed cowbird traps, with the efforts of Wildlife Specialist Barry Benson. The Natural Resources Foundation of Wisconsin (NRF) funded nest monitoring and cowbird trapping and offered field trips that provided outreach for public engagement and generated funding to cover housing costs for the nest monitors. Barry Benson, Jon Robaidek, Kim Grveles, Rich Staffen, Amy Staffen, Sarah Warner, Mark Pfof, Jens Jensen, Anna Jocham and Ashley Hannah were trip leaders for the field trips.

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This year our outstanding Kirtland's warbler monitors were Ashley Hannah, Anna Jocham, Lake White and Mike Peczynski. Nancy Livingston provided lodging for one of our nest monitors, as she has for the past ten years. Barb and Ed Saloga provided housing for the Marinette County nest monitor. Ron Refsnider and Joel Trick contributed their expertise to make the color-banding efforts a success and the USFWS covered costs associated with their travel.

The generous efforts of numerous enthusiastic birders allowed us to survey for Kirtland's warblers for the state-wide census at many Wisconsin sites. We wish to thank Rob Baller, Kurt Brownell, Tim Collins, Patrick Hager, Dan Jackson, Donna Roche, Paul Schwalbe, Glenna Schwalbe, Jack Swelstad, Curtis Twellmann, and Dave Wiemiller for their survey assistance. The U.S. Forest Service, Chequamegon-Nicolet National Forest also conducted surveys for Kirtland's. Pete Villas, Marinette County Forest Administrator, provided assistance in identifying potential suitable habitat to survey for Kirtland's warblers, as well as conducting habitat understory research projects.

Our work with Kirtland's warblers in Wisconsin generates a great deal of interest, and our success is a tribute to the many individuals and organizations involved in the project. We are grateful to receive tremendous support from the public and conservation community. As has been the case throughout the life of the project (a decade), we continue to be dependent upon the critical contributions of our numerous partners—thank you all!