

# 2008 Capture and Banding of Kirtland's Warblers (*Dendroica kirtlandii*) in Wisconsin

## ***Ronald L. Refsnider***

8825 Mississippi Blvd.  
Coon Rapids, MN 55433  
763. 780. 2413  
refsn001@umn.edu

## ***Joel A. Trick***

U.S. Fish & Wildlife Service  
2661 Scott Tower Drive  
New Franken, WI 54229  
920. 866. 1737  
joel\_trick@fws.gov

## ***Jennifer L. Goyette***

Cofrin Center for Biodiversity  
University of Wisconsin-Green Bay  
Dept. of Natural and Applied Sciences  
Green Bay, WI 54311  
414. 526. 0808  
goyettej@uwgb.edu

**K**irtland's Warblers, listed as an endangered species by the U.S. Fish and Wildlife Service (USFWS), were first documented nesting in Wisconsin in 2007. At that time, eight males, three females, and three nests were observed in Adams County. Two of the nests appeared to be parasitized by Brown-headed Cowbirds (*Molothrus ater*) and subsequently juvenile cowbirds were observed being fed by adult Kirtland's Warblers near those two nests (Trick et al. 2008). With the

encouragement of the federal Kirtland's Warbler Recovery Team, the USFWS and the Wisconsin Department of Natural Resources (WDNR) decided to attempt color-banding the adult male Kirtland's Warblers found in Wisconsin in 2008. Marking individual Wisconsin Kirtland's Warblers would allow for identification of birds that might be observed on the wintering grounds or that return to Wisconsin in future years, and may give insight into habitat use and the pio-

neering of new locations in Wisconsin. Other initiatives planned for 2008 included a cowbird control program similar to that successfully used in Michigan's Kirtland's Warbler nesting areas, a statewide survey of potentially suitable habitat for additional Kirtland's Warblers, and an on-site monitor to collect detailed behavioral and biological data and determine the outcome of any nesting attempts at the Adams County site. Being able to visually identify individual males would also greatly aid the on-site behavioral and biological monitoring.

Joel Trick, Endangered Species Biologist for the USFWS Green Bay Field Office, recruited Ron Refsnider, retired USFWS Region 3 Endangered Species Listing Coordinator, to do the banding. Refsnider has banded passerines in Minnesota since 1986. Additionally, Refsnider worked in the Kirtland's Warbler recovery program in Michigan, including color-banding Michigan Kirtland's Warblers in the mid-90s. The federal Recovery Team supported his role in banding the Wisconsin Kirtland's Warblers. Jennifer Goyette, the third member of the banding team, was monitoring Kirtland's Warbler activity daily for the USFWS and the WDNR in two adjacent sections in Adams County where Kirtland's Warblers had been documented in 2007. The capturing and banding were conducted under a USFWS endangered species subpermit issued to the USFWS Green Bay Field Office and a bird banding permit from the U.S. Geological Survey Bird Banding Laboratory (BBL) issued to Refsnider. Verbal approval was obtained from the WDNR; a state endangered species permit was not needed because Kirtland's Warblers

are not yet on the Wisconsin endangered and threatened species list. Verbal approvals were also obtained from landowners. The USFWS Region 3 Division of Endangered Species, Ft. Snelling, Minnesota, provided field communication equipment, and Necedah National Wildlife Refuge provided lodging for Refsnider during this work.

#### CAPTURE AND BANDING PROTOCOL

A modified version of the 1997 netting and banding protocol developed for use in Michigan, and approved by the Kirtland's Warbler Recovery Team, was used in Wisconsin. The banding team set up a 4-shelf, 12-meter long by 2.6 meter high black nylon mist net (36 mm stretched mesh size) within the territory of each male Kirtland's Warbler. The net was erected within the male's defended territory based on song perches used by the bird. If a female was present and a nest location could be estimated, the net was placed between male song perches and the presumed nest location, but sufficiently far from the nest to reduce the chance of capturing a female involved in nest-building or incubation. A decoy Kirtland's Warbler (a stuffed yellow fabric "bird" with hand-drawn black mask and wing feathers and a tail of trimmed cockatiel [*Nymphicus hollandicus*] feathers) was placed in the third shelf near the center of the net. Songs and chip notes from a "stranger" Kirtland's Warbler (mp3 files provided by Robert Reitsma, Smithsonian Institution) were played through two speakers placed on the ground or suspended low in the vegetation adja-

cent to the center of the net and the decoy. Song/chip note files were 0.5 or 1.0 minutes in duration and were separated by 0.5, 1.0, 2.0, or 3.0 minutes of silence to resemble the irregular timing of normal Kirtland's Warbler vocalizations. After the net and audio equipment were set up, the banding team retreated 7 to 10 meters beyond the end of the net to observe activity while the songs were played.

Refsnider immediately removed captured Kirtland's Warblers from the net and carried out the banding process. Goyette and Trick removed the non-target species that were captured (two Yellow-rumped Warblers [*D. coronata*], two Chipping Sparrows [*Spizella passerina*], one Dark-eyed Junco [*Junco hyemalis*], and one Clay-colored Sparrow [*S. pallida*]), took digital photos, and filled out data sheets for each Kirtland's Warbler captured. Unbanded Kirtland's Warblers were given a USGS size 1 numbered aluminum band (issued by BBL to Refsnider) and 3 celluloid color bands (see page 100). The color bands and color combinations were provided by Carol Bocetti (Leader of the Kirtland's Warbler Recovery Team) using color combinations not yet used by other Kirtland's Warbler banders in the US, Canada, or the Bahamas. Color bands were carefully sealed with a drop of acetone to enhance their retention. The birds were sexed and aged using characteristics described by Pyle (1997). Sex was determined by the presence/absence of black facial mask, brightness of yellow plumage, and the presence of a cloacal protuberance or brood patch. Aging was based mainly on shape of the retrices and the color, edging, and shape of the primary coverts (see page 100).

#### THE INITIAL BANDING EFFORT

On the morning of 9 June 2008 Refsnider and Trick met Goyette at the Adams County Kirtland's Warbler site to initiate banding. At that time Goyette was certain that 6—and possibly 8—Kirtland's Warbler males, 4 females, and 2 nests were present on the site. The team was hoping to band several of the males that day, and planned to band the rest over the next day or two. Goyette led the team to the vicinity of the most advanced nest and selected a net location that was about 50 meters from the nest site to avoid capture of the brooding female, yet be in a area that would be vigorously defended by her mate. This Kirtland's Warbler territory was chosen as the first target to ensure that this male would not be disturbed later, perhaps after he had commenced feeding nestlings.

Goyette had observed two males, one of which was already color-banded, frequenting this area, and she was uncertain which of the males was paired with the nesting female. After 10 minutes of song and chip note playback a male Kirtland's Warbler became entangled in the net. The team's first capture was a color-banded male (color band combination Y/A-I/Y; refer to Table 1 for BBL band numbers and color band combinations) who had been banded on the island of Eleuthera in the Bahamas on 20 March 2008 (David Ewert, pers. comm.).

Over the course of the first day the team successfully captured and color-banded five additional Kirtland's Warbler males at the Adams County site. None of these five additional males had been banded previously. The abil-

Table 1. Band Numbers & Color Combinations of Kirkland's Warblers Captured in Wisconsin in 2008. Color Band Order: upper left leg/lower left leg—upper right leg/lower right leg; Color Codes: A=Aluminum, B=Blue (light blue), G=Green, I=Indigo (dark blue), J=Jet (black), O=Orange, P=Purple, R=red, Y=Yellow.

USGS Band Number	Color Combination	Date Captured	Wisconsin County
2221-09191*	Y/A—I/Y	9 June 2008	Adams
2021-91891	A/O—J/G	9 June 2008	Adams
2021-91892	A/O—I/B	9 June 2008	Adams
2021-91893	A/O—B/Y	9 June 2008	Adams
2021-91894	A/O—R/B	9 June 2008	Adams
2021-91895	A/J—P/G	9 June 2008	Adams
2021-91896	A/J—O/I	10 June 2008	Marinette
2021-91897	A/I—G/P	19 June 2008	Adams
2021-91898	A/I—P/B	19 June 2008	Marinette

\*Banded on the island of Eleuthera, Bahamas, 20 March 2008

ity to readily capture all six of the Adams Kirkland's Warbler males known to be present was due in large part to Goyette's detailed knowledge of the song perches and two nest locations of those six males.

A few days earlier a participant in the statewide survey had notified Trick of one to three Kirkland's Warbler males believed to be singing in Marinette County. On 10 June Refsnider and Trick traveled to Marinette County. There they heard, caught, and banded a single Kirkland's Warbler (A/J-O/I). Song playbacks did not elicit responses from additional Kirkland's Warblers. At that time no other Kirkland's Warbler males were known in Wisconsin, so banding operations ceased after capturing six males in Adams County and one male in Marinette County.

#### THE SECOND BANDING EFFORT

On 12 June Goyette confirmed the presence of an unbanded Kirkland's Warbler male less than 20 meters from where the team had initially placed a net on 9 June to capture male A/O-

R/B. However, no male had responded on 9 June to songs at that net site during 30 minutes of playback, so the net was moved about 100 meters over a small ridge to be closer to where the male (A/O-R/B) was singing. He had been quickly caught there. Goyette had suspected the existence of a second male in that area, but she had been unable to conclusively distinguish it from neighboring males until one had been color banded.

On 16 June Trick received a report of another Kirkland's Warbler male in Marinette County about 20 miles north of banded male A/J-O/I. With the finding of this second unbanded Kirkland's Warbler male in the state, we decided to resume banding efforts.

On 19 June Refsnider and Goyette easily netted and color-banded the seventh Adams County Kirkland's Warbler male (A/I-G/P) that Goyette had confirmed on 12 June. For the previous week he had been the only unbanded male in that area, allowing Goyette to locate his specific song perches and select an optimal location for the net.

Refsnider then traveled to Marinette County where Trick had been observing the movements of the unbanded Marinette County male. Trick had observed the male singing from several perches, two of which were on opposite sides of an old logging road through older jack pines. We chose to take advantage of the natural net lane provided by the logging road. However, during 44 minutes of playback from that site the male sang only four times and remained in an adjacent stand of younger jack pines. After we moved the net to that stand, 15–20 meters from where he seemed to be singing, we caught him in 9 minutes.

At that time no other male Kirtland's Warblers had been confirmed in the state, so banding was terminated for the year. The team had captured nine Kirtland's Warbler males in Wisconsin and banded the eight not previously banded.

Goyette subsequently confirmed an eighth (unbanded) Kirtland's Warbler male at the Adams County site. Other reports of sightings in Marinette, Jackson, and Bayfield Counties sounded credible but attempts to confirm these sightings were unsuccessful. At that time (approaching the end of June) we were faced with a diminishing ability to capture males, due to a reduction in their territorial defense, and the increased likelihood of disturbing fledglings. Given this altered benefit to risk situation we decided to forgo additional banding efforts in 2008.

#### MISCELLANEOUS OBSERVATIONS

Six of the nine Kirtland's Warblers were captured within the first 15 min-

utes of song playback. One was netted in less than a minute, and two others were captured in less than five minutes. Two of the three exceptions to the generally quick capture seem to indicate the importance of net location.

The first exception was A/O-R/B, mentioned above, who sang occasionally, but did not move toward the net during the 30 minutes we left the net at its first location. However, after moving the net over a low ridge and closer to the singing male, we caught him in 10 minutes.

The second exception was the late afternoon effort to capture A/J-P/G. Playback began at 3:57 p.m. During 53 minutes of playback he moved approximately 270 degrees around the net and bounced off the net several times toward the end of this period before finally becoming entangled. Just prior to his capture the team had discussed ending netting efforts for that day and returning to this bird later in the week. Time of day may have been a factor in this slow capture.

The third exception was A/I-P/B, the second Marinette County bird. This was a mid-afternoon capture effort, with playback initiated at 1:18 p.m. Playback lasted 44 minutes at the first net site in older jack pines and 9 minutes at the second net site in younger jack pines.

Counting the top net shelf as #1, four Kirtland's Warbler males were caught in shelf #2, four were caught in shelf #3, and one was caught in shelf #4. No Kirtland's Warblers were captured in shelf #1. All birds were safely extracted from the nets by Refsnider. We estimate that extraction time was less than 2 minutes for all but one

Table 2. Sex, Age, & Measurements of Kirkland's Warblers Captured in Wisconsin in 2008. Age Codes: AHY=after hatch year, ASY=after second year, SY=second year. Fat Scores: 0=fat absent from furculum depression, 1=trace of fat in furculum, 2= thin layer of fat in furculum.

Color Bands	Sex	Age	Mass (g)	Wing Chord (mm)	Tail (mm)	Fat Score
Y/A—I/Y	M	ASY	14.8	71	59	0
A/O—J/G	M	SY	13.6	70	58	0
A/O—I/B	M	ASY	14.7	74	60	1
A/O—B/Y	M	SY	14.7	73	59	1
A/O—R/B	M	SY	14.0	69	59	1
A/J—P/G	M	AHY	14.8	70	58	2
A/J—O/I	M	AHY	13.9	70	60	1
A/I—G/P	M	AHY	13.7	71	56	0
A/I—P/B	M	SY	14.3	69	59	1

bird which was entangled in two net shelves. All birds were released in apparent healthy condition after processing. Several sang within two to three minutes of release; others were seen preening nearby. Processing time from capture to release ranged from 11 to 22 minutes per bird; median processing time was 14 minutes. All seven Adams County males were observed exhibiting normal behavior by Goyette over the next two to four weeks. One of the Marinette banded males was observed as late as two weeks after banding (John Probst pers. comm.).

Data collected from each Kirkland's Warbler included mass, wing chord length, tail length, fat score, and plumage notes. Table 2 provides most of these data. Photos were taken of the head, spread right wing, spread tail, a dorsal view, a lateral view, and the bands. GPS coordinates were noted for each net location, but are not included in this report to protect these sites from disturbance due to potentially excessive human visits. Researchers who need precise location information should contact Trick.

These were not the first Kirkland's

Warblers to be banded in Wisconsin. During the late 1980s and 1990s Wes Jones—a retired USFWS biologist, bird bander, and former Kirkland's Recovery Team member—banded five adult males in the state (Danny Bystrak, BBL, pers. comm.). Those captures occurred in Douglas (1 male), Jackson (2), Vilas (1), and Washburn (1) Counties. All of those males were color-banded (Carol Bogetti pers. comm.).

#### LITERATURE CITED

- Pyle, P. 1997. Identification Guide to North American Birds. Part I—Columbidae to Ploceidae. Slate Creek Press, Bolinas, California. 732 pp.
- Trick, J. A., K. Grveles, D. DiTommaso, and J. Robaidek. 2008. The first Wisconsin nesting record of Kirkland's Warbler (*Dendroica kirtlandii*). Passenger Pigeon 70: 93–102.

*Ron Refsnider retired in 2007 from the U.S. Fish and Wildlife Service where he had worked as an endangered species biologist for 23 years and was the Midwest Regional Endangered Species Listing Coordinator. During his career he worked to protect and recover a broad range of rare species, including northern monkshood*

*(Aconitum), cave snails, Kirtland's Warblers, and gray wolves. He currently conducts bird banding programs at several nature centers in the Minneapolis-St. Paul area.*

*Joel Trick is a wildlife biologist with the U.S. Fish and Wildlife Service Green Bay Field Office, where his work duties include review of federal projects, migratory birds, and endangered species, including Whooping Crane, Piping Plover, and Kirtland's Warbler. He holds B.S. and M.S. degrees*

*from the University of Wisconsin-Green Bay.*

*Jennifer Goyette is working on her M.S. degree at the University of Wisconsin Green Bay under Dr. Robert Howe. Her thesis research involves using bioacoustic research techniques in the monitoring of tropical and temperate forest bird communities. Jennifer has extensive experience as an avian field technician and has also worked in avian rehabilitation and science illustration.*