

Kentucky Warbler (*Geothlypis formosa*) Species Guidance

Family: Parulidae – the wood-warblers

State Status: [Threatened](#) (1989)

State Rank: [S1S2?B](#)

Federal Status: [None](#)

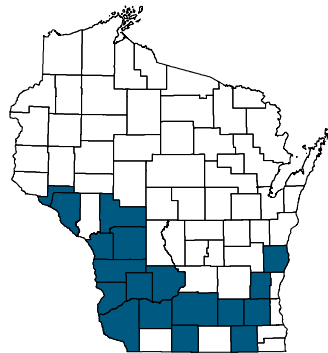
Global Rank: [G5](#)

Wildlife Action Plan

Mean Risk Score: [3.4](#)

Wildlife Action Plan Area

Importance Score: [2](#)



Counties with documented locations of Kentucky Warbler breeding or breeding evidence in Wisconsin. Source: Natural Heritage Inventory Database, October 2018.



Photo by Lana Hays

Species Information

General Description: The Kentucky Warbler is approximately 13cm (5.1 in) long, and has a relatively short tail and long, pinkish legs. Males have olive-green upperparts, a bright yellow throat and underparts, black coloring on the crown and sides of the face, and distinct yellow spectacles. Females have similar plumage, but with less black coloring on the crown and sides of the face. Plumages are similar throughout the year. Immatures resemble females (Howell and Webb 1995, Dunn and Garrett 1997, Dunn and Alderfer 2006).

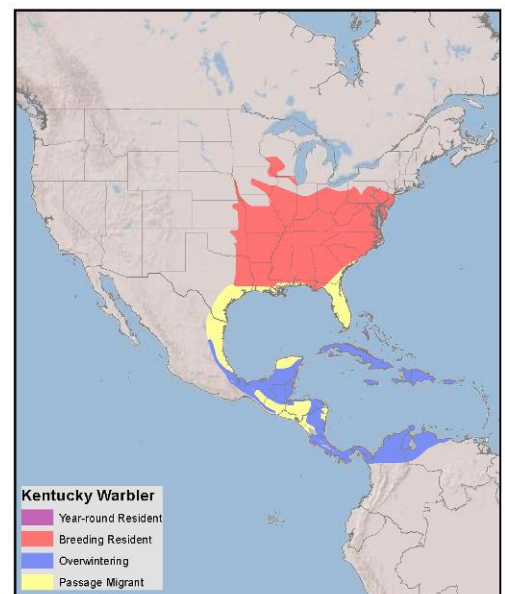
The Kentucky Warbler's song is a loud series of 5-8 rolling notes: *chuuree chuuree chuuree...* or *tory-tory-tory...* The call is a smacking *chip* or *chup* (Howell and Webb 1995, Dunn and Garrett 1997, Dunn and Alderfer 2006). An example of a typical song can be heard here: http://www.allaboutbirds.org/guide/kentucky_warbler/sounds

Definitive Identification: The Kentucky Warbler's olive-green upperparts, bright yellow underparts, and yellow spectacles distinguish it from similar species.

Similar Species: Immature Kentucky Warblers resemble immature male Common Yellowthroats (*Geothlypis trichas*) and female Hooded Warblers (*Setophaga citrina*). However, immature male Common Yellowthroats have longer tails than Kentucky Warblers, and lack yellow spectacles. Female Hooded Warblers have a longer tail with white outer feathers, and more extensive yellow on the face (Dunn and Garrett 1997). Kentucky Warblers and Ovenbirds (*Seiurus aurocapilla*) have a similar song pattern, but the song of Ovenbird is more rolling, less mechanical, tends to have an upward inflection at the end of each phrase, and often builds to a crescendo (Dunn and Garrett 1997).

Associated Species: Within appropriate upland hardwood forest types, Kentucky Warblers could occur with the following Species of Greatest Conservation Need: Yellow-billed Cuckoo (*Coccyzus americanus*), Acadian Flycatcher (*Empidonax virescens*), Wood Thrush (*Hylocichla mustelina*), Cerulean Warbler (*Setophaga cerulea*), Worm-eating Warbler (*Helmitheros vermivorum*), Yellow-throated Warbler (*Setophaga dominica*), and Hooded Warbler. Within high-quality floodplain forest habitats in Wisconsin, Kentucky Warblers often co-occur with the following Species of Greatest Conservation Need: Yellow-crowned Night-Heron (*Nyctanassa violacea*), Red-shouldered Hawk (*Buteo lineatus*), Yellow-billed Cuckoo, Cerulean Warbler, and Prothonotary Warbler (*Protonotaria citria*).

State Distribution and Abundance: Wisconsin is at the northern edge of this species' breeding range (Robbins 1991), and therefore the Kentucky Warbler has likely never been common in the state. The Kentucky Warbler breeds sparingly throughout the Wisconsin and Mississippi river drainage systems in southwest Wisconsin (Mossman and Lange 1982) and along the Lower Chippewa River, and



Global range map for Kentucky Warbler. (NatureServe 2013)

(*Acer saccharum*), American basswood (*Tilia americana*), beech (*Fagus grandifolia*) (Cutright 2006) or red oak (*Quercus rubra*) (M. Mossman pers. comm.), and heavily wooded bottomlands (Robbins 1991). The Kentucky Warbler occurs in Wisconsin most commonly at the ecotone between floodplain and upland forest, and in small forest openings (~5 adjacent trees removed) within large forest tracts, often among swamp white oak (*Quercus bicolor*), elm (*Ulmus* spp.), and ash (*Fraxinus* spp.) trees (Steele 2010, Steele and Mossman *in prep*). Robbins (1979) considered the Kentucky Warbler to be area sensitive and estimated a minimum area requirement of approximately 30 ha (80 acres), and Mossman (1988) found them in floodplain forests only ≥ 200 ha (500 acres). Riparian corridor width may also be important in some regions. Peak and Thompson (2006) found higher densities of this species in wide (400-530m [1300-1700 ft]) forested riparian areas compared to narrow (55-95m [180-300 ft]) forested riparian areas of northeastern Missouri.

Threats: Limiting factors for the Kentucky Warbler are poorly known. Loss and fragmentation of mature, moist deciduous forests negatively impact this species. Over-browsing by deer may suppress populations locally by reducing the shrub layer available for nesting. Altered hydrologic regimes in addition to invasive plant competition and the emerald ash borer are causing tree regeneration problems within riparian systems (WDNR 2005). Deforestation on the wintering grounds, particularly in regions with mature forests, also is a concern (McDonald 1998).

Climate Change Impacts: Habitat models for Wisconsin indicate a reduction of suitable growing conditions for floodplain forests but an expansion of suitable growing conditions for upland hardwood forests (Swanston et al. 2011, WICCI 2011), although expansion depends on landscape connectivity and propagule (seed) availability. Although upland hardwood forest expansion might increase the amount of suitable forest cover for Kentucky Warblers, the species' dependence on additional forest characteristics (see "Habitat" section) will likely continue to limit its abundance in the state. Potential climate change impacts to Kentucky Warbler at the continental scale include a northward shift in distribution resulting from changes in winter temperatures (Matthews et al. 2004).

Survey Guidelines: Persons handling Kentucky Warblers must possess a valid [Endangered and Threatened Species Permit](#). If surveys are being conducted for regulatory purposes, survey protocols and surveyor qualifications must first be approved by the Endangered Resources Review Program (see *Contact Information*). Area searches are effective for surveying Kentucky Warblers in forest stands <100 acres. Survey the entire affected area that contains suitable Kentucky Warbler nesting habitat (see "Habitat" section), by walking slowly throughout the area and stopping occasionally to listen for Kentucky Warbler vocalizations. Point counts can be used for stands >100 acres and require that the observer stand in one spot for 10 minutes and record all birds seen or heard within a 100m (330 ft) radius. Point-count stations should be placed a minimum of 250m (820 ft) apart. For either the area-search or point-count method, record the following data: all Kentucky Warblers seen or heard, numbers of pairs and juveniles, behavioral observations such as courtship displays or food carries, and other Species of Greatest Conservation Need that are present at the site. Whenever possible, also map the approximate territory boundaries.

Carry out surveys between June 1 and July 4, preferably 10 days apart, and including at least one survey less than one week prior to any proposed project activity that may impact Kentucky Warblers (see *Screening Procedures*). Begin surveys within 15 minutes of sunrise and complete them within four hours, or no later than 10 am. Conduct surveys during appropriate weather (i.e., no fog, rain, or wind >10 mph; Ralph et al. 1993). Personnel conducting surveys must be able to identify Kentucky Warblers by sight and sound. At least three surveys conducted with the above protocol and yielding negative results are needed to determine that the species is not present at a site for the purposes of these guidelines.

Summarize results, including survey dates, times, weather conditions, number of detections, detection locations, and behavioral data and submit via WDNR online report: <<http://dnr.wi.gov>, keyword "rare animal field report form">.

Management Guidelines

The following guidelines typically describe actions that will help maintain or enhance habitat for the species. These actions are not mandatory unless required by a permit, authorization or approval.

Kentucky Warbler conservation in Wisconsin requires managing for a patchy, dense understory within large (>80 acres) mature, moist deciduous forest stands. Focus conservation efforts within appropriate ecological landscapes, including [southeast glacial plains](#) and [western coulee and ridges](#) (WDNR 2005). Within these landscapes, key conservation sites include the Lower Wisconsin and Lower Chippewa rivers, the Baraboo Hills region, and Southern Kettle Moraine (Mossman and Hoffman 1989, Steele 2010).

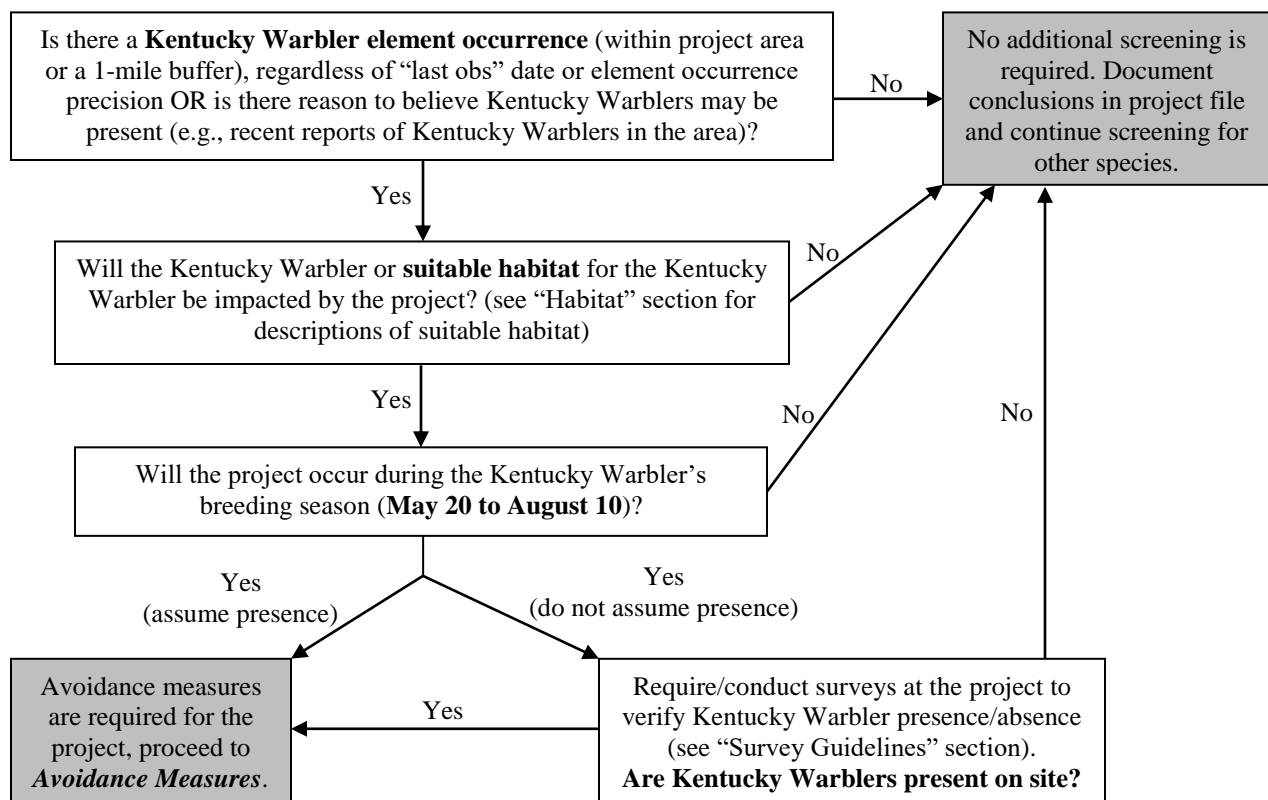
Appropriate management decisions depend on landscape context and site-specific characteristics. Landscapes that provide the highest reproductive potential for Kentucky Warblers contain >50% forest cover and ideally >70% forest cover within a 10km (6 mi) radius, as well as high levels of forest connectivity (DAI 2008). Landscapes containing <50% forest cover within a 10km (6 mi) radius have a low potential for Kentucky Warbler conservation (DAI 2008). Non-forested or agriculture-dominated landscapes have been shown to have greater parasitism and predation rates for forest birds (Robinson 1995, Buehler et al. 2008).

Suitable breeding habitat has the following components: 1) extensive forest tract, possibly 80-acre area requirement, 2) moist or mesic sites with mature deciduous trees, 3) proximity to small canopy openings (~5 adjacent trees removed), 4) patchy, dense understory of shrubs, saplings, and herbaceous vegetation, and 5) proximity to natural ecotone between lowland and upland forest. Increase overall site suitability for this species by promoting a well-developed ground cover and a patchily distributed, dense understory. In managed stands with a minimal understory shrub layer, timber harvesting techniques that result in canopy gaps (e.g., group selection harvests) can increase the understory shrub layer. Deer browse can depress tree regeneration and severely limit habitat in some areas, and consideration should be given to lowering deer densities or otherwise protecting habitats from browse in designated conservation areas for this species. Establish corridors >100m (330 ft) wide between existing forest stands to increase forest connectivity (DAI 2008).

Screening Procedures

The following procedures must be followed by DNR staff reviewing proposed projects for potential impacts to the species.

Follow the “Conducting Endangered Resources Reviews: A Step-by-Step Guide for Wisconsin DNR Staff” document (summarized below) to determine if Kentucky Warbler will be impacted by a project (WDNR 2012):



Avoidance Measures

The following measures are specific actions required by DNR to avoid take (mortality) of state threatened or endangered species per Wisconsin’s Endangered Species law (s. 29.604, Wis. Stats.). These guidelines are typically not mandatory for non-listed species (e.g., special concern species) unless required by a permit, authorization or approval.

According to Wisconsin’s Endangered Species Law (s. 29.604, Wis. Stats.), it is illegal to take, transport, possess, process, or sell any wild animal on the Wisconsin Endangered and Threatened Species List (ch. NR 27, Wis. Admin. Code). Take of an animal is defined as shooting, shooting at, pursuing, hunting, catching or killing.

If *Screening Procedures* above indicate that avoidance measures are required for a project, follow the measures below. If you have not yet read through *Screening Procedures*, please review them first to determine if avoidance measures are necessary for the project.

1. The simplest and preferred method to avoid take of Kentucky Warblers is to avoid directly impacting individuals, known Kentucky Warbler locations, or areas of suitable habitat (described above in the “Habitat” section and in *Screening Procedures*).
2. If Kentucky Warbler impacts cannot be avoided entirely, avoid impacts during the **breeding season (May 20 to August 10)**.
3. If Kentucky Warbler impacts cannot be avoided, please contact the Natural Heritage Conservation Incidental Take Coordinator (see *Contact Information*) to discuss possible project-specific avoidance measures. If take cannot be avoided, an [Incidental Take Permit or Authorization](#) is necessary.

Additional Information

References

- Baicich, P.J., and C.J.O. Harrison. 1997. *A Guide to the Nests, Eggs, and Nestlings of North American Birds*. Second Edition. Natural World Academic Press, San Diego, CA. 347pp.
- Buehler, D.A., J.J. Giocomo, J. Jones, et al. 2008. Cerulean Warbler reproduction, survival, and models of population decline. *Journal of Wildlife Management* 72(3): 646-653.
- DAI [Driftless Area Initiative]. 2008. *Managing from a Landscape Perspective: a guide for integrating forest interior bird habitat considerations and forest management planning in the Driftless Area of the Upper Mississippi River Basin*. 48pp.
- Cink, C.L. 2006. Kentucky Warbler nest characteristics in northeastern Kansas. *Kansas Ornithological Society Bulletin* 57(2):16.
- Cutright, N.J. 2006. Kentucky Warbler. *In Atlas of the Breeding Birds of Wisconsin*. (N.J. Cutright, B.R. Harriman, and R.W. Howe, eds.) The Wisconsin Society for Ornithology, Inc. 602pp.
- Dunn, J.L., and K.L. Garrett. 1997. *A Field Guide to Warblers of North America*. Houghton Mifflin Co., New York. 656pp.
- Dunn, J.L., and J. Alderfer, eds. 2006. *National Geographic Field Guide to the Birds of North America*. 5th Edition. National Geographic Society, Washington, D.C.
- Howell, S.N.G., and S. Webb. 1995. *A Guide to the Birds of Mexico and Northern Central America*. Oxford University Press, New York.
- Kilgo, J.C., R.A. Sargent, K.V. Miller, and B.R. Chapman. 1996. Nest sites of Kentucky Warblers in bottomland hardwoods of South Carolina. *Journal of Field Ornithology* 67(2):300-306.
- Matthews, S., R. O'Connor, L.R. Iverson, A.M. Prasad. 2004. *Atlas of climate change effects in 150 bird species of the Eastern United States*. Gen. Tech. Rep. NE-318. Newtown Square, PA; U.S. Department of Agriculture, Forest Service, Northeastern Research Station.
- McDonald, M.V. 1998. Kentucky Warbler. *The Birds of North America*, No. 324 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Mossman, M.J., and K.L. Lange. 1982. *Breeding Birds of the Baraboo Hills, Wisconsin: their history, distribution, and ecology*. Department of Natural Resources and Wisconsin Society for Ornithology, Madison, WI. 196pp.
- Mossman, M.J. 1988. Birds of southern Wisconsin floodplain forests. *Passenger Pigeon* 50:321-337.
- Mossman, M.J. and R.M Hoffman. 1989. Birds of southern Wisconsin upland forests. *Passenger Pigeon* 51:343-358.
- NatureServe. 2013. Data provided by NatureServe in collaboration with Robert Ridgely, James Zook, The Nature Conservancy - Migratory Bird Program, Conservation International - CABS, World Wildlife Fund - US, and Environment Canada - WILDSPACE. Data were accessed Jan. 2013.
- Peak, R.G., and F.A. Thompson III. 2006. Factors affecting avian species richness and diversity in riparian areas. *Journal of Wildlife Management* 70(1):173-179.

- Ralph, C.J., G.R. Geupel, P. Pyle, T.E. Martin, and D.F. DeSante. 1993. Handbook of field methods for monitoring landbirds. Gen. Tech. Rep. PSW-GTR-144. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture. 41pp.
- Robbins, C.S. 1979. Effect of forest fragmentation on bird populations. Pages 198-212 *in* Management of North Central and Northeastern Forests for Nongame Birds (R.M. DeGraff and K.E. Evans, eds.). Gen. Tech. Rep. NC-51. U.S. Department of Agriculture, Forest Service. <http://www.ncrs.fs.fed.us/pubs/gtr/other/gtr_nc051/index.htm> (Accessed August 2010).
- Robbins, S.D., Jr. 1991. Wisconsin Birdlife: Population and distribution past and present. Madison, WI: Univ. Wisconsin Press.
- Robinson, S.K. 1995. Threats to Neotropical migratory birds in the Midwest. Pages 1-21 *in* Management of Midwestern Landscapes for the Conservation of Neotropical Migratory Birds (F.R. Thompson, III, ed.). Gen. Tech. Rep. NC-187. St. Paul, MN; U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, U.S. Department of Agriculture. 208pp.
- Sauer, J.R., E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966-2007. Version 5.15.2008. USGS Patuxent Wildlife Research Center, Laurel, MD.
- Steele, Y. 2010. Managing for Priority Birds on the Lower Chippewa River Important Bird Area. Wisconsin Bird Conservation Initiative, Important Bird Areas Program, Madison, WI. <<http://www.wisconsinbirds.org/TBA/chippewariverreport.pdf>> (Accessed October 2012).
- Steele, Y. and M.J. Mossman. *In prep.* A Bird Conservation Strategy for the Lower Wisconsin River Important Bird Area. Wisconsin Bird Conservation Initiative, Important Bird Areas Program and Wisconsin Department of Natural Resources, Madison, WI.
- Swanston, C., M. Janowiak, L. Iverson, L. Parker, D. Mladenoff, L. Brandt, M. St. Pierre, A. Prasad, S. Matthews, M. Peters, D. Higgins, and A. Dorland. 2011. Ecosystem vulnerability assessment and synthesis: a report from the Climate Change Response Framework Project in northern Wisconsin, Version 1. U.S. Department of Agriculture, Forest Service, Northern Research Station. <<http://www.nrs.fs.fed.us/pubs/38255>>
- WDNR [Wisconsin Department of Natural Resources]. 2005. Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need: A State Wildlife Action Plan. Madison, WI. <<http://dnr.wi.gov>, key word "Wildlife Action Plan">
- WDNR [Wisconsin Department of Natural Resources]. 2009. Wisconsin wildlife action plan species profile: Kentucky Warbler. (Accessed October 2012). Madison, Wisconsin, USA. <material now available on the Natural Heritage Conservation species Web page: <http://dnr.wi.gov>, key word "biodiversity">
- WDNR [Wisconsin Department of Natural Resources]. 2012. Conducting Endangered Resources Reviews: A Step-by-Step Guide for Wisconsin DNR Staff. Bureau of Endangered Resources. Wisconsin Department of Natural Resources, Madison, Wisconsin.
- WDNR [Wisconsin Department of Natural Resources]. 2013. Natural Heritage Inventory database. (accessed June 15, 2011).
- WICCI [Wisconsin Initiative on Climate Change Impacts]. 2011. Wisconsin's Changing Climate: Impacts and Adaptation. 2011. Nelson Institute for Environmental Studies, University of Wisconsin-Madison and the Wisconsin Department of Natural Resources, Madison, Wisconsin. <http://www.wicci.wisc.edu/report/2011_WICCI-Report.pdf>

Linked Websites:

- Cornell Lab of Ornithology All About the Birds: <http://www.allaboutbirds.org/guide/kentucky_warbler/id>
- Natural Communities of Wisconsin: <<http://dnr.wi.gov>, key word "natural communities">
- Rare Animal Field Report Form: <<http://dnr.wi.gov>, key word "rare animal field report form">
- Wisconsin Bird Conservation Initiative All Bird Conservation Plan: <<http://www.wisconsinbirds.org/plan/species/kewa.htm>>
- Wisconsin Wildlife Action Plan: <<http://dnr.wi.gov>, key word "Wildlife Action Plan">
- Wisconsin Initiative on Climate Change Impacts: <<http://www.wicci.wisc.edu/>>
- Wisconsin Endangered and Threatened Species: <<http://dnr.wi.gov>, key word "endangered resources">
- Wisconsin Endangered and Threatened Species Permit: <<http://dnr.wi.gov>, key word "endangered species permit">
- Wisconsin Natural Heritage Inventory Working List Key: <<http://dnr.wi.gov>, key word "Natural Heritage Working List">

Funding

- Natural Resources Foundation of Wisconsin: <<http://www.wisconservation.org/>>
- USFWS State Wildlife Grants Program: <<http://wsfrprograms.fws.gov/subpages/grantprograms/swg/swg.htm>>
- Wisconsin Natural Heritage Conservation Fund
- Wisconsin DNR Division of Forestry

Contact Information (Wisconsin Species Experts for Kentucky Warbler)

- Refer to the Bird contact on the [Rare Species and Natural Community Expert List](#)

Contact Information (Federal Migratory Bird Treaty Permits or Questions)

- [Larry Harrison](#), U.S. Fish and Wildlife Service, 5600 American Blvd. West, Suite 990, Bloomington, MN 55437-1458 (612-713-5489, Larry_Harrison@fws.gov)
- See also <<http://www.fws.gov/migratorybirds/mbpermits.html>>

Endangered Resources Review Program Contacts

- General information (DNRERReview@wisconsin.gov)
- [Rori Paloski](#), Incidental Take Coordinator, Wisconsin DNR, Bureau of Natural Heritage Conservation (608-264-6040, rori.paloski@wi.gov)

Suggested Citation

- Wisconsin Department of Natural Resources. 2013. Wisconsin Kentucky Warbler Species Guidance. Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources, Madison, Wisconsin. PUB-ER-694.

Developed by

- Kim Kreitinger, primary author
- Gregor W. Schuurman, primary editor

Special Acknowledgment

We acknowledge the administrators of the [Wisconsin Bird Conservation Initiative All Bird Conservation Plan](#) webpage for allowing reproduction of text in several parts of this document.

Wisconsin Department of Natural Resources
Bureau of Natural Heritage Conservation
PO Box 7921
Madison, WI 53707-7921
<http://dnr.wi.gov>, keyword "ER"

