

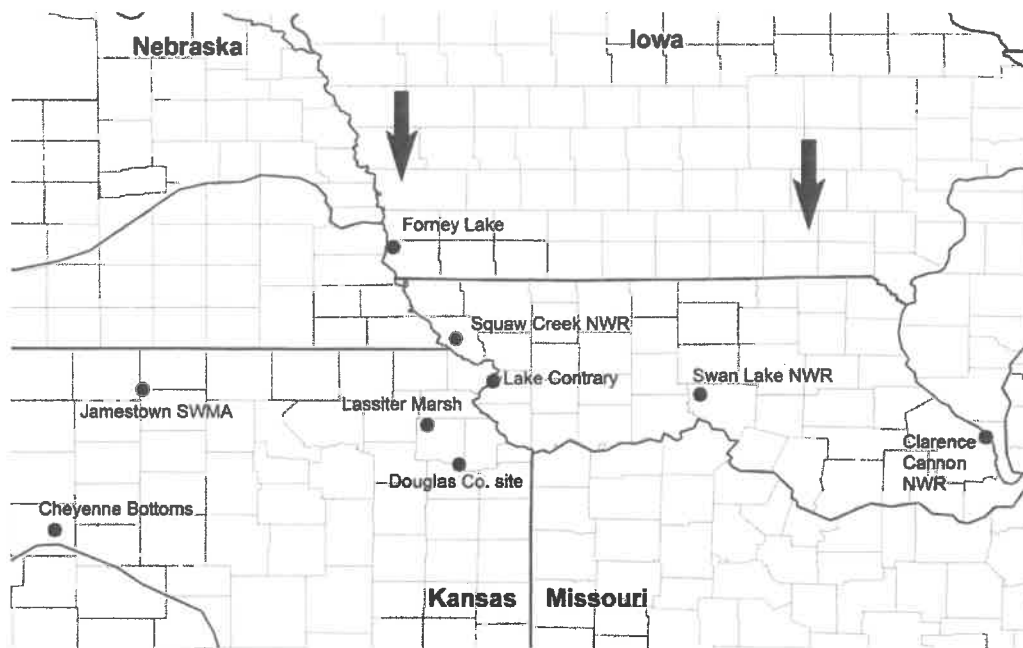


FIG. 1. Map with localities mentioned in the text. Arrows indicate presumed direction of mid-July and August movement.

METHODS

Following the July–August 2009 discovery, I reviewed the late Floyd Lawhon's and my unpublished field notes from northwestern Missouri to determine if there were summers when Eastern Marsh Wrens were absent or present in low numbers during late May through the first week of July compared to numbers recorded during the second week of July through August. Lawhon's almost weekly (includes some multiple observations/week) coverage of cattail-dominated marshes in northwestern Missouri (Lake Contrary, St. Joseph, Buchanan County; Squaw Creek National Wildlife Refuge (NWR), Holt County; Fig. 1) during a thirty year period (late 1950s through 1987) provided an ideal data set. My observations also included Squaw Creek NWR and two nearby areas in Holt County for the period of 1971–2009.

Following perusal of those field notes, I contacted other observers in the interior of North America, extending from eastern Colorado to the Mississippi River to determine if they had pertinent data. Then, beginning in 2010, I and a number of observers (see Acknowledgments)

began systematically monitoring cattail-dominated marshes for Marsh Wrens from late spring through August from southern Nebraska, southern Iowa, northern Missouri, eastern Colorado and Kansas. This initial monitoring was confined to that region because Marsh Wrens are present throughout late spring through the entire summer in areas to the north of the above geographical region (eBird 2014, Kroodsma and Verner 2014, Robbins 2014), hence, it would be difficult to ascertain if movements occurred there without banding birds and conducting much more intense monitoring. As part of a reassessment of the contact zone between Eastern and Western Marsh Wrens in Nebraska (Kroodsma 1988) I made extensive surveys during 2011 of cattail-dominated marshes throughout much of eastern Nebraska. Those data provided details on the breeding distribution of these two taxa during June (Robbins 2014). eBird data, involving hundreds of presence and absence records for Marsh Wren were evaluated online in October 2014. Identification voucher specimens and audio recordings are viewable online via VertNet and the Macaulay Library (Cornell Laboratory of Ornithology, Ithaca, NY, USA), respectively.

and the southernmost July–August breeding localities, the distance of the movement involves a minimum of 300 km (Fig. 1).

In Nebraska, Kroodsma (1988) delineated the distribution of both Eastern and Western Marsh Wrens in 1986, and 25 years later, in 2011, I repeated the delineation of the zone of contact that resulted in virtually identical results in those two assessments (Robbins 2014, KU specimens, audio recordings at Macaulay Library). During the late May–June breeding period, Eastern Marsh Wrens are primarily confined to the northeastern corner of Nebraska. Within Iowa, Eastern Marsh Wrens primarily nest in the northwestern and north-central sections and sparingly further south (Kent and Dinsmore 1996, eBird 2014). At Forney Lake, Fremont County, in southwestern Iowa, Keith Dyche noted the same magnitude of incursion of breeders during July (see Results) that has been documented 100 and 150 km to the south at Squaw Creek NWR and Lake Contrary, Missouri, respectively. It is likely that the incursion of Eastern Marsh Wrens occurs across a much broader area, but in areas where the species is present in relatively large numbers throughout the summer, such as the eastern Dakotas, southern Minnesota, northeastern Nebraska, northern Iowa and Illinois, it would be more difficult to detect an influx of new breeders.

There is considerable overlap in the area where both Eastern Marsh Wren *C. p. palustris* and Sedge Wren *C. stellaris* move to breed during the second half of the summer in the Midwest. If this intra-summer, dual breeding behavior is an ancestral trait of *Cistothorus* then the present two species groups have adapted this trait for exploiting very different habitats. Presumably this behavior evolved in the ancestor in response to year to year and intra-seasonal variation in these ephemeral breeding habitats. Perhaps, in part, the more specific and ephemeral habitat requirements, cat-tail-dominated marshes of *C. p. palustris* vs. that of a relatively broad spectrum of grassland types that *C. stellaris* utilizes to breed, may explain why there may not be more overlap in their late summer breeding period. This is especially evident near the southern portion of the tallgrass prairie region, such as southeastern Kansas and southwestern Missouri, where *C. stellaris* routinely breeds during July–August, but for which *C. p. palustris* apparently does not reach. To date, the furthest south that Eastern Marsh Wrens have been documented breeding during the July–August

period is Douglas County, Kansas and north of the Missouri River to at least the Mississippi River. In Illinois, confirmed breeding apparently is restricted to the north (Bohlen 1989), however, eBird (2014) data indicate that birds appear in central and southern Illinois during July–August, so breeding should be looked for in appropriate habitat at that time of year as well as in central and southern Indiana and Ohio.

Finally, it should be noted that there is a small, year-round population of Eastern Marsh Wrens at a sewage treatment plant near Columbia, Boone County, Missouri, just north of the Missouri River (P. McKenzie, pers. comm.). At this latter location, it is unknown whether May–June breeding birds are supplemented by July–August northern migrant/breeders.

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LITERATURE CITED

- AMERICAN ORNITHOLOGISTS' UNION. 1998. Check-list of North American birds. Seventh Edition. American Ornithologists' Union, Washington, D.C., USA.
- BARKER, F. K. 2004. Monophyly and relationships of wrens (Aves: Troglodytidae): a congruence analysis of heterogeneous mitochondrial and nuclear DNA sequence data. *Molecular Phylogenetics and Evolution* 31:486–504.
- BEDELL, P. A. 1996. Evidence of dual breeding ranges for the Sedge Wren in the central Great Plains. *Wilson Bulletin* 108:115–122.
- BOHLEN, H. D. 1989. The birds of Illinois. Indiana University Press, Bloomington, USA.
- EBIRD. 2014. eBird: an online database of bird distribution and abundance. eBird, Ithaca, New York, USA. <http://www.ebird.org> (accessed October 2014).
- HOBSON, K. A. AND M. B. ROBBINS. 2009. Origins of late-breeding nomadic Sedge Wrens in North America: limitations and potential of hydrogen-isotope analyses of soft tissue. *Condor* 111:188–192.
- KENT, T. H. AND J. J. DINSMORE. (Editor). 1996. Birds in Iowa. Iowa City and Ames, Iowa, USA.
- KROODSMA, D. E. 1988. Two species of Marsh Wren (*Cistothorus palustris*) in Nebraska? *Nebraska Bird Review* 56:40–42.
- KROODSMA, D. E. 1989. Two North American song populations of the Marsh Wren reach distributional limits in the central Great Plains. *Condor* 91:332–340.

- KROODSMA, D. E. 2005. The singing life of birds: the art and science of listening to birdsong. Houghton Mifflin Co., New York. USA.
- KROODSMA, D. E. AND J. VERNER. 2014. Marsh Wren (*Cistothorus palustris*). The birds of North America online. Number 308.
- PARKES, K. C. 1959. Systematic notes on North American birds: 3. The northeastern races of the Long-billed Marsh Wren (*Telmatodytes palustris*). Annals of Carnegie Museum 35:275–281.
- PHILLIPS, A. R. 1986. The known birds of North and middle America: Part 1. A. R. Phillips, Denver, Colorado, USA.
- ROBBINS, M. B. 2014. Contact zone of the Eastern and Western Marsh Wrens in Nebraska revisited. Nebraska Bird Review 82:128–130.
- ROBBINS, M. B. AND Á. S. NYÁRI. 2014. Canada to Tierra del Fuego: species limits and historical biogeography of the Sedge Wren (*Cistothorus platensis*). Wilson Journal of Ornithology 126:649–662.
- WALSBERG, G. E. 1977. Ecology and energetics of contrasting social systems in *Phainopepla nitens* (Aves: Ptilonotidae). University of California Publications in Zoology 108:1–63.

Authors Queries

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