


3-2005

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Scharf, William C., "New Westward Breeding Records for Eastern Towhees in Central Nebraska" (2005). *Nebraska Bird Review*. 1110.
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NEW WESTWARD BREEDING RECORDS FOR EASTERN TOWHEES IN CENTRAL NEBRASKA

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INTRODUCTION

The current breeding range of Eastern Towhees (*Pipilo erythrophthalmus*) in Nebraska is described as westward to a line from Cedar Co through Platte, Hall and Harlan Cos (*NBR* 64: 124, Sharpe *et al.* 2001). Frequent recent sightings of Eastern Towhees during the breeding season have been made from more westward locations. A few reports are from Lincoln Co., 5 June 2004 by TJ Walker (*NBR* 72: 91), and Dawson Co., 13 May 2004 by Laurel Badura (*NBR* 72: 55). In contrast to the capture data presented here, none of the sightings is corroborated with breeding condition data such as cloacal protuberance or brood patch nor are nests located. Further recent sightings (Silcock in press *NBR*: 73) indicate the probability of Spotted Towhee genes in the eastern-most counties of Nebraska through intermediate songs and plumage. There are no other known capture studies that have data of the type presented here from the central Platte River valley.

Sibley and West (1959), working from museum specimens, indicated genetic influences of Eastern Towhees in central Nebraska with their hybrid index based on a scale from 0 to 7 for combined sexes, with 0 being pure Eastern Towhee phenotypes and with scores greater than 0 influenced by Spotted Towhee, *P. maculatus*, genes. In an east-west gradient along the Platte River, Elm Creek had a hybrid index of 1.9, Gothenburg, 2.0 and Sutherland 2.2. This is contrasted with much higher scores of 3.5 and 3.8 for birds collected at more northerly locations on the Niobrara River and at Chadron respectively. The values for Blair and Omaha indicate nearly pure populations of Eastern Towhees with a 0.14 score. Scharf and Kren in Brown *et al.* (1996) recorded 33 mostly Easterns and 29 mostly Spottededs out of 62 hybrid birds banded at Lake Ogallala.

METHODS AND STUDY AREAS

Four sites in Dawson County, Nebraska, (at 40° 41' N ranging from 99° 22' to 99° 33' W), were mist-netted to capture and band birds over four nesting seasons. Two sites were within the Cottonwood Ranch Property of Nebraska Public Power District, and two sites were within the Jeffrey Island Habitat Area of Central Nebraska Public Power and Irrigation District.

Each of the four sites had a minimum of ten standard 3-m x 12-m mist nets with either 36-mm or 30-mm mesh erected on 3.3-m poles in likely-looking openings between habitat cover patches. Where the nets were proximate to the river, they were oriented at right angles to the channel. The original net locations were maintained through four spring-summer seasons. There was a regular rotation of capture days among sites with each set of ten nets being opened every fourth day. Nets were opened at or slightly before dawn each morning for at least six hours

unless high temperature, wind or rain caused concern for the welfare of the birds. Accumulated effort was 14,856 net hours in riparian woodlands for the four nesting seasons.

Captured birds were banded with U.S. Geological Survey bands. The sex of adult breeding towhees was determined by plumage. To determine breeding condition, males were checked for cloacal protuberance, and females for brood patch (Pyle 1997). In this study, only males with unspotted coverts, scapulars and interscapulars, but with a large white patch at the base of the primaries and females with a rich brown head and back, as in typical *P. erythrophthalmus*, were categorized as Eastern Towhees (category 0 of Sibley and West 1959). A few hatching-year birds with no dorsal spotting were designated Eastern Towhees, and those with dorsal spotting were called Spotted Towhees.

RESULTS

I captured 107 individual towhees, excluding 15 recaptures, of both species as well as hybrids during the four nesting seasons. There were 20 Eastern Towhees exhibiting the phenotype of category 0 (Sibley and West 1959). They comprised 19% of all individual towhees captured. The sexes of Eastern Towhees were distributed as 11 males and 7 females with 2 hatching-year birds of unknown sex. There were 87 towhees comprising hybrids and Spotted Towhees, categories 1 to 7 of Sibley and West (1959). They include 81% of the towhees captured. The sexes of the hybrids and Spotted Towhees were 43 males and 40 females with 4 hatching-year birds of unknown sex. Table 1 shows the distribution of captures of individuals of the two species with hybrids grouped together with Spotted Towhees.

Table 1. Number of towhees captured by year.

Year	Eastern Towhees	Spotted Towhees and hybrids
2001	9	9
2002	5	22
2003	3	31
2004	3	25
Total	20	87

DISCUSSION

Extension of the range of the Eastern Towhee in Nebraska may be viewed as further evidence of eastern bird species invading westward through an extension of eastern woodlands along the Platte River (Currier and Davis 2000). Alternatively, the cottonwood/ash woodlands are of historic lineages, and these records may represent a status quo that has been hitherto undetected by ornithologists (Johnson 1994, Johnson and Boetcher 2000). The possibility that Spotted Towhees may actually have moved eastward along the wooded riparian zone seems to be an alternative that is seldom considered, but see Silcock (in press *NBR*: 73).

It is my experience in Nebraska that hybrid ratios and their associated sibling species numbers vary greatly from year to year in the same location (Brown *et al.* 1996, Scharf, unpublished data). The year of highest captures of Eastern Towhees coincides with the year of lowest captures of Spotted Towhees (Table 1). This illustrates a tension zone maintained by a balance between dispersal and selection against hybrids (Barton and Hewitt 1985).

My reasoning in choosing towhees without spots (category 0 of Sibley and West 1959) is that uniformity exists within the Eastern Towhee genotype and the appearance of spots on the plumage indicates a discontinuity in that genotype representing hybridization (Moore and Buchanan 1985). Thus, all towhees with spots represent this discontinuity moving toward a new uniformity of genotype within the Spotted Towhee species. The two towhee species seem to represent a truly plastic genetic mix.

ACKNOWLEDGMENTS

I thank Nebraska Game and Parks Commission for my state banding permit. Riley Anderson, Linda R. Brown, and Nick Morgan assisted in mist-netting. Paul A. Johnsgard gave help on an earlier draft of this manuscript. Funding was received from Nebraska Public Power District, and Central Nebraska Public Power and Irrigation District. Mark Peyton and Jim Jenniges, biologists for Jeffrey Island Habitat Area, and Cottonwood Ranch respectively, aided this project in numerous ways.

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