

DISPERSAL AND VAGRANCY IN THE PYRRHULOXIA

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ABSTRACT: The Pyrrhuloxia (*Cardinalis sinuatus*) frequently is considered sedentary. A compilation of extralimital records, however, shows that the species wanders regularly in late fall and winter (chiefly November through March) north and east of its United States range and wanders casually in the spring and summer (May through July) west of this range. There are even six records well outside the species' normal range. The differing geographic and temporal distributions of extralimital records coincide with two subspecies (nominate *C. s. sinuatus* in the east and *C. s. fulvescens* in the west), hinting at the possibility of underlying differences in breeding biology and dispersal timing between the subspecies.

The Pyrrhuloxia (*Cardinalis sinuatus*) is a bird of the arid southwestern United States and northern Mexico. Its range extends into the arid subtropics on either side of the Sierra Madre Occidental, south to Nayarit on the coastal slope and the central Mexican Plateau inland. It consists of three subspecies. Nominate *C. s. sinuatus* Bonaparte, 1838, occurs east from southeastern Cochise County, Arizona (Phillips et al. 1964)—that is, it is the taxon east of the Sierra Madre Occidental. *C. s. beckhami* (Ridgway, 1887), with a type from El Paso, Texas, is widely treated as a junior synonym of the nominate subspecies. West of the Sierra Madre Occidental is *C. s. fulvescens* (van Rossem, 1934), characterized by its larger size and brownish gray, not slaty, back (Phillips et al. 1964). There is also a disjunct subspecies in Baja California Sur, the darker and duskier *C. s. peninsulae* (Ridgway, 1887).

In the United States the Pyrrhuloxia occurs in thorn forest and thorn scrub in southeastern Arizona, southern New Mexico, and western and southern Texas. This species is tied closely to mesquite (*Prosopis* spp.) or similar thorny trees (Maurer 1985, Tweit and Thompson 1999). For example, in their study of the avifaunal community of the Chihuahuan Desert, Pidgeon et al. (2001) reported that “of the many open-cup nesters present, only the Pyrrhuloxia had highest abundance in mesquite exclusively.” Throughout the 20th century the Pyrrhuloxia followed the northward spread of mesquite—a result of overgrazing—through the grasslands of the northern Chihuahuan Desert and the southern shortgrass prairie (Oberholser 1974, Lloyd et al. 1998, Pidgeon et al. 2001). As a result, many of the extralimital records from the first half of the 20th century (e.g., Phillips et al. 1964) lie within the species' current range.

EXTRALIMITAL OCCURRENCES

Yet the Pyrrhuloxia continues to occur well outside of even this newly established range. The species is largely sedentary—banded individuals have been found in the same area in both summer and winter (Gould 1961). As a result, vagrancy has been limited geographically, with few extralimital

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records north of northern Texas, western Oklahoma, southwestern Kansas, southeastern Colorado, northeastern New Mexico, western and northern Arizona, and southern California (A.O.U. 1998). Records from southern Nevada have been questioned (e.g., A.O.U. 1998, Tweit and Thompson 1999), but the recently established Nevada Bird Records Committee has placed the species on the state list (Elphick 2001) on the basis of two records, one supported by a photograph (see Stotz 1980).

There are only six records from substantially farther afield: a male photographed on San Miguel Island, California, 19–23 July 1990 (Heindel and Garrett 1995); one in Linn County in east-central Kansas, 1–22 April 1995 (Table 1, Figure 1); a male photographed near Grant, Park County, Colorado, early July–20 September 1996 (Figure 1; Janos 1998, Truan and Percival 1997); a male photographed at Durango, La Plata County,

Table 1 Extralimital Records of the Pyrrhuloxia, Ordered by Time of Year, from the Southern Great Plains^a

Date(s)	Location	Source
1 Jan–28 Feb 1993	Kansas; Morton Co.; Elkhart	Kansas B.R.C., AB 47:273
9–16 Jan 1994	Kansas; Hamilton Co.; near Syracuse	Kansas B.R.C.
2 Feb 1995	Kansas; Sedgwick Co.; Wichita	Kansas B.R.C.
21 Mar 1999	Oklahoma; Oklahoma Co.; Oklahoma City	Oklahoma B.R.C.
10 Apr 1999	Texas; Hutchinson Co.	<i>N. Am. Birds</i> 53:302
1–22 Apr 1995	Kansas; Linn Co.; Marais des Cygnes W.A.	Kansas B.R.C.
25 Apr 2000	Kansas; Ford Co.; near Dodge City	Kansas B.R.C.
19 May 2000	Kansas; Stafford Co.; Quivira N.W.R.	Kansas B.R.C.
8 Jun 1975	Texas; Wilbarger Co.	Pulich (1988)
4 Jul 1998	Oklahoma; Beaver Co.; Beaver W.M.A.	Oklahoma B.R.C.
12 Oct 1999	Texas; Tarrant Co.	<i>N. Am. Birds</i> 53:77
6 Nov–early Dec 1989	Kansas; Morton Co.; near Elkhart	Thompson and Ely (1992)
12 Dec 2001–21 Feb 2002	Oklahoma; Comanche Co.; Wichita Mts.	Oklahoma B.R.C.
12 Dec 2005–early Feb 2006	Oklahoma; Jackson Co. ^b	Oklahoma B.R.C.
mid-Dec 1972–12 Apr 1973	Texas; Denton Co.; Denton	Pulich (1988)
17–20 Dec 1989	Colorado; Prowers Co.; near Holly	Andrews and Righter (1992)
26 Dec 1992–18 Apr 1993	Texas; Tarrant Co.; Ft. Worth	<i>Am. Birds</i> 47:277, 47:433
28 Dec 1975–1 May 1976	Oklahoma; Cimarron Co.; near Kenton	Oklahoma B.R.C.

^aSee text for definition. When applicable, each record has been accepted by the local bird records committee (B.R.C.). Abbreviations: Co., county; N.W.R., national wildlife refuge; W.A., wildlife area.

^bTwo individuals, photographed.

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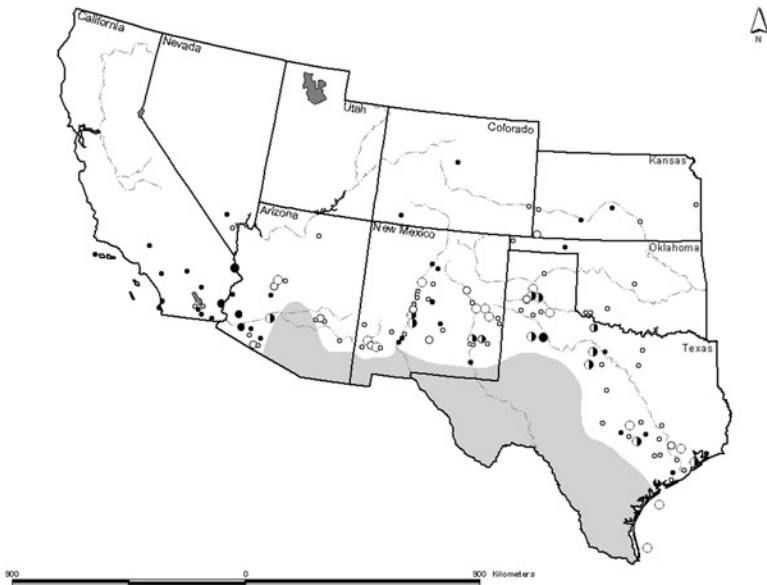


Figure 1. Extralimital records of the Pyrrhuloxia (*Cardinalis sinuatus*) in the southwestern United States. The shaded area represents the species' typical range (adapted from Phillips et al. 1964, Tweit and Thompson 1999, Lockwood and Freeman 2004, and Corman and Wise-Gervais 2005). Solid circles represent late spring or summer records (May–July), empty circles late fall or winter records (chiefly late October through April), and half-filled circles locales with records from both periods. Dot size varies from small (1 record for the locale) to medium (2 records) to large (3 or more records).

Colorado, 29–30 April 1999 (Lisowsky 2001); a bird at Billings, Montana, at least 13–16 December 2000 (Lenard et al. 2003); and a female photographed at Eagle, Elgin County, Ontario, 25 December 2004–1 January 2005 (Cannings 2005).

TIMING OF VAGRANCY

The timing of the Pyrrhuloxia's vagrancy is not random but it does not follow the "typical" pattern of vagrancy of birds appearing out of range during spring or fall migration. Rather, as Seyffert (2001) noted, "The Pyrrhuloxia is notorious for wandering northward after the nesting season," in this case meaning that out-of-range records hail from late fall and winter. This pattern is particularly evident in New Mexico and Texas (Figure 1), where the species wanders north annually along the Rio Grande to Socorro County, in the Pecos River basin to De Baca and Roosevelt counties (Parmeter et al. 2002), and into the southern Texas panhandle, generally on the Llano Estacado north to the Red River valley (Seyffert 2001). The Pyrrhuloxia also moves regularly at

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this season to the Texas coast (Lockwood and Freeman 2004) east as far as Houston, where it has occurred as early as 30 October (Lasley and Sexton 1990). About 10 were recorded even on oil rigs in the Gulf of Mexico 22 October–2 November 1999 (Russell 2005). Records outside the breeding range in New Mexico and Texas typically extend from early November through March (Figure 2), although some birds have appeared as early as mid-October and others have lingered through April (e.g., Table 1).

In Arizona winter vagrancy is less pronounced, although there is “an influx of additional numbers in winter” to the Phoenix area (Witzeman et al. 1997), and the Pyrrhuloxia has wandered at that season north to other locales along the Gila River, west to Gila Bend (Monson and Phillips 1981). There are few winter records farther north in Arizona, although the species has reached Skull Valley, Yavapai County (Witzeman and Stejskal 1985), and a male was photographed in Tuba City, Coconino County, 20 December 1986 (Witzeman and Stejskal 1987). Elsewhere in the Southwest, winter vagrants have reached southeastern California (Table 2; two records, one of a male that returned three consecutive winters, Patten et al. 2003) and Henderson, Nevada (a “well-photographed male” on the Christmas Bird Count 15 December 1979; Stotz 1980).

Vagrancy in late spring and summer is more limited, at least in New Mexico and Texas (Figures 1, 2). Nevertheless, there are scattered records between late April and late July from southwestern and central Colorado (see above), northern New Mexico (Hubbard 1978), and the southern Great Plains, here defined as Oklahoma, Kansas, eastern Colorado, the Texas panhandle north

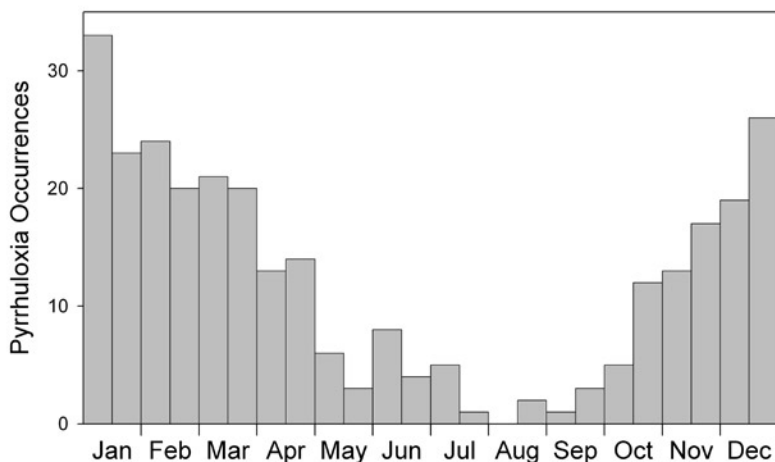


Figure 2. Seasonal occurrence of extralimital Pyrrhuloxias in New Mexico, Texas, and the southern Great Plains. Seasonal status is portrayed on the basis of ~200 records from Table 1 and gleaned from Pulich (1988), Seyffert (2001), and, especially, a 25-yr period (1978–2002) of the regional reports published quarterly in *North American Birds* and its predecessors (i.e., *American Birds* and *Field Notes*).

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Table 2 Extralimital Records of the Pyrrhuloxia, Ordered by Time of Year, from and West of the Lower Colorado River Valley^a

Date(s)	Location	Source
24 Feb–8 Mar 1971; 31 Dec 1971–27 Mar 1972; 22 Jan–23 Mar 1973	California; Imperial Co.; Heise Springs	McCaskie (1971)
7–10 May 1983	California; Los Angeles Co.; near Lancaster	California B.R.C.
14 May 1983	California; San Bernardino Co.; Chemehuevi Wash	California B.R.C.
15 May 1993	Nevada; Clark Co.; Corn Creek	<i>Am. Birds</i> 47:437
23 May 1974	California; Imperial Co.; Brock Research Center	California B.R.C.
26–27 May 1983	California; San Diego Co.; Encinitas	California B.R.C.
27 May 2002	California; Imperial Co.; near Palo Verde	California B.R.C.
28 May–8 Jul 1995	California; San Bernardino Co.; Chemehuevi Wash	California B.R.C.
28 May–5 Jun 1996	California; Imperial Co.; El Centro	California B.R.C.
1 Jun 1986	California; Riverside Co.; Cottonwood Springs	California B.R.C.
6 Jun–23 Jul 1977	California; San Bernardino Co.; Chemehuevi Wash	California B.R.C.
10 Jun 1998	California; San Diego Co.; Pt. Loma	California B.R.C.
4 Jul 1981	Arizona; La Paz Co.; near Ehrenberg	Rosenberg et al. (1991)
14 Jul 1974	California; Imperial Co.; Palo Verde	California B.R.C.
18 Jul 1974	California; Imperial Co.; Westmorland	California B.R.C.
19–23 Jul 1990	California; Santa Barbara Co.; San Miguel Island	California B.R.C.
23 Jul 1982	California; Riverside Co.; Corona	California B.R.C.
31 Jul 1999	California; San Bernardino Co.; Yucca Valley	California B.R.C.
15 Dec 1979	Nevada; Clark Co.; Henderson	<i>Am. Birds</i> 34:625
17 Dec 1972–19 Feb 1973	California; Imperial Co.; Calipatria	California B.R.C.

^aWhen applicable, each record has been accepted by the local bird records committee (B.R.C.).

of the Canadian River, and north-central Texas north of the Brazos River. Farther west, however, spring and summer vagrancy is the rule: from and west of the lower Colorado River valley, 17 of 20 records fall between early May and the end of July (Table 2). A record of a female photographed in Costa Mesa, Orange County, 7 February–14 March 1999, was rejected by the California Bird Records Committee on the grounds of questionable natural occurrence. This record is perhaps best treated with caution given the season and the species' status in captivity in adjacent northwestern Baja California, where Hamilton (2001) noted up to five per day offered for sale in pet stores.

A few Pyrrhuloxias that strayed far from the species' normal range have bred. In California, the species has twice bred at Chemehuevi Wash, which drains into the Colorado River on the west side of Lake Havasu (Luther 1980, Garrett and Singer 1998). In Arizona, the species has bred near Wickenburg in northwestern Maricopa County (Monson and Phillips 1981) and was found in the Castle Dome and Mohawk mountains of Yuma County in the late 1950s (Phillips et al. 1964), where it presumably bred. In Texas, Oberholser (1974) listed breeding records east to Lee, Bastrop, and Travis counties on the Edwards Plateau, and the species has nested in the southern part of the panhandle (Seyffert 2001).

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The difference in timing of vagrancy coincides with the geographic ranges of the two nonpeninsular subspecies. Reasons for apparent subspecific differences in dispersal timing are speculative, but perhaps they stem from differences in nest timing. Anderson and Anderson (1946) noted of Arizona *C. s. fulvescens*, “apparently, nesting does not occur very early.” This statement may not be true in an absolute sense, but it does appear to hold relative to *C. s. sinuatus* in Texas. On the basis of egg-set data reported by Tweit and Thompson (1999: table 1, $n = 200$ nests), Arizona birds nest significantly later than Texas birds ($\chi^2 = 12.09$, $df = 4$, $P < 0.025$), possibly because some of the former forego nesting until the onset of monsoon rains (see Short 1974). If so—and the observation of dependent young in mid-October (Anderson and Anderson 1964) lends indirect support—then perhaps Pyrrhuloxias in Texas and New Mexico routinely fledge sooner than those in Arizona, allowing them to disperse sooner as well. Regardless of the underlying cause, the seasonality of vagrancy of presumptive *C. s. sinuatus* and *C. s. fulvescens* differs strikingly, suggesting avenues for future research into comparative dispersal patterns between the subspecies.

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