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Northern "Yellow-shafted" Flicker (*Colaptes auratus*) with red feathers banded in Wayne Co., MI

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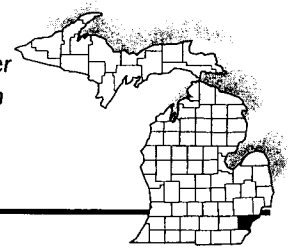


The Northern Flicker (*Colaptes auratus*) is a polytypic species. Two distinct color forms are recognized: the "Yellow-shafted" found east of the Rocky Mountains (*C. a. auratus*, hereafter YSFL), and the "Red-shafted" found west of the Rockies (*C. a. cafer*, RSFL). The most obvious difference between the forms is the color of the flight feathers and tail: YSFL have yellow shafts and undersides to these feathers, while the RSFL's are salmon-red. Other conspicuous differences include RSFL lacking the red patch on the nape present in YSFL, having brown rather than gray crowns, and having gray rather than tan throats. The malar areas ("mustaches") of male RSFL are red, while male YSFL have black malars.

The two forms freely interbreed in a stable hybrid zone extending along the east slope of the Rockies from southern Alaska to the Texas panhandle (Moore 1995). Their distinctive plumages are apparently inherited independently (Wiebe and Bortolotti 2001), resulting in offspring that show a wide variety of traits, including combinations from either or both parents, or intermediate forms of each (Moore 1995). In this paper, flickers showing mixed plumages from the hybrid zone are referred to as "hybrids," while birds from outside the zone are called "intergrades" (the term used by the U.S. Bird Banding Lab for mixed-plumage flickers).

Intergrade Banded

On 9 Oct 2002, the Rouge River Bird Observatory (RRBO) captured a flicker intergrade on the campus of the University of Michigan-Dearborn, Wayne Co., as part of regular banding operations (for a site description, see Craves and Gelderloos 1996). The bird was a female, and was aged as a hatching-year bird based on the size and shape of the outermost primary, the color and shape of the

Table 1. Literature records of flicker intergrades from Michigan.

Location	Date	Description	Source	Notes
Michigan	1 from Mar, 1 from Jul, 2 from Sep 20 Jul 1929	trace of red in malar stripe grayish throat	Wood 1951	all refer to UMMZ[1] specimens
Michigan	1942, 1944, 1947 1929	traces of pink or salmon in wings or tail few red feathers in malar	Kelley 1961	all refer to UMMZ specimens, some perhaps different from Wood
Bloomfield Twp., Oakland Co.	1951	p 7,8 orange all rects reddish[2]	Kelley 1961	Specimen formerly in Cranbrook Inst. Sci. collection
Huntington Woods, Oakland Co.	spring 1954	similar to above	Kelley 1961	banded by Neil Kelley
Bloomfield Twp., Oakland Co.	fall 1959	Colors varied from pale pink to deep orange-red; some yellow distally but shafts usually red; color in pp 3-8, most often 4-6; only 3 birds had red in rects; malars of all males black (this description may also apply to 4 birds below, unclear from note)	Kelley 1961	4 banded by Kelleys, 3 by W. Nickell (1 recaptured in Sep 1960)
Bloomfield Twp., Oakland Co.	August 1960	salmon in wings	Kelley 1961	3 immatures and 1 adult banded by Kelleys

1 University of Michigan Museum of Zoology, Bird Collection; specimen numbers were not given, and therefore some of these specimens may be included in Table 2.

2 "p" = primary feather, "pp" = plural; "rects" = rectrices, or tail feathers

Table 2. Flicker intergrades in UMMZ collection.

Location UMMZ number	Dates	Sex Description (as it deviates from YSFL)[1]
Grosse Ile, Wayne Co. 156236	31 Oct 1958	female p 7,6 red[1]; rects 1-5 red
FCI (prison) Milan, Milan, Wayne Co. 219312	30 Apr 1964	male p 7,6,5 red; rects 1-5 red
Grosse Pointe, Wayne Co. 113328	2nd week Sep 1947	female? (poor shape, sex not noted on tag) p 6,5 red
Burt Lake, Cheboygan Co. 126556	23 Sep 1947	female p 8,7 red; rect 4 red
Kalamazoo, Kalamazoo Co. 207932	1 May 1979	male p 7,6 red; rect 1 red proximally
Ann Arbor, Washtenaw Co. 227099	18 Apr 1986	female p 6 red on proximal half rect 3 red on proximal half
Ann Arbor, Washtenaw Co. 110368	14 Jul 1941	female p 6 red; one rect red
Midland, Midland Co. 155570	31 Aug 1960	female p 7,6 red; incoming rects 4,5 red
Scio Twp., Washtenaw Co. 233942	12 Jul 1993	male p 6,5 red; rect 2,3 red
Washtenaw Co. 110856	28 Apr 1942	male p 7,6 red proximally

1 "Red" in these descriptions refers to any non-yellow color, including pink or orange hues or reds of varying intensity

tail feathers (rectrices), and the color and wear of the flight feathers (Pyle 1997). The bird had completed its prebasic molt.

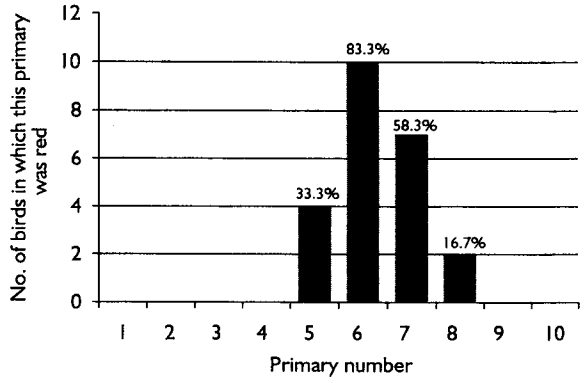
The bird bore characteristics of a YSFL, with these exceptions: the top of the crown was tan, primaries 6 and 5 on each wing and their corresponding coverts were salmon-red, and rectrices 2 and 3 on each side of the tail were also red. Color photographs of this bird can be viewed at <http://www.umd.umich.edu/dept/rouge_river/flickerinter.html>.

Michigan Records

I searched the literature and found two references (Wood 1951, Kelley 1961) documenting 22 flicker intergrades from Michigan (Table 1). I also examined the University of Michigan Museum of Zoology (UMMZ) Bird Collection. There were 45 birds labeled as *C. auratus* x *cafer* from all over North America, and 175 YSFL specimens from Michigan. To avoid damaging the specimens, I initially checked for red coloration in the rectrices or the malar area of males. Wings of specimens with either of these characteristics were then carefully examined. There were 10 Michigan flicker intergrades out of 242 specimens (Table 2), providing a total of 32 Michigan intergrades.

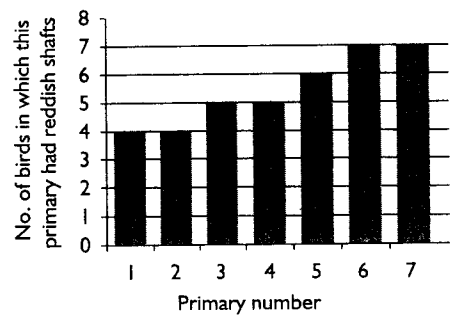
Twenty-six of the 32 Michigan intergrades had one or more red primary feathers. In 11 of those birds, the exact primaries involved could be determined (either mentioned specifically in the literature, or examined in the hand). In all 11 birds, and the RRBO bird, only primaries among 5 through 8 were red. Primary 6 was red in 83.3% of birds, and primary 7 in 58.3% (Figure 1). Additionally, of the 7 birds in Kelley (1961), only primaries 3 through 8 were red, most among 4 through 6. This is a fairly consistent pattern of only certain primaries being red rather than yellow. Exploring further, I found two additional birds from outside Michigan and east of the Mississippi River among the 45 *C. auratus* x *cafer* specimens. A bird from Wisconsin did not have mixed primaries, but the other one, from Ocean Co., NJ, had a full red nape patch, all reddish rectrices, and primaries 10 through 5 red. I also examined 139 YSFL specimens from outside Michigan; none showed mixed traits.

Figure 1. Red primaries in 12 Michigan YSFL (see text for sources). Primaries are numbered from the outermost primary in.



This pattern is interesting because pigment expression is so variable in hybrids from the hybrid zone that few are alike (W. Moore, pers. comm.). Of the 25 *C. auratus x cafer* UMMZ hybrid specimens from the hybrid zone (as outlined by Moore 1995), there was no similar consistent pattern: 15 were *auratus*-types and none had red primaries, the shafts only were reddish on 7 birds (Figure 2). The other 10 were *cafer*-types, 5 had orangish or gold primaries and 1 had a single yellow primary with a pink shaft. I did not find any RSFL with yellow primaries (N=151).

Figure 2. Reddish shafts in primaries of 7 YSFL-type hybrids from the hybrid zone.



Diet and Plummage Color

Diet can be ruled out as a cause for the mixed primary colors in the RRBO bird, and probably the other intergrades examined. Both the red and yellow feather colors in flickers are derived from carotenoid pigments (Wiebe and Bortolotti 2001). Several other species of birds have been observed with orange replacing yellow coloration in plumage, most notably the terminal tail bands of Cedar Waxwings (*Bombycilla cedrorum*). This trait has been traced to the ingestion of rhodoxanthin, a red pigment found in the berries of some honeysuckle shrubs (*Lonicera* sp.) (Hudon and Brush 1989, Witmer 1996). The feathers of all birds reported with rhodoxanthin-related plumage changes (see summary in Craves 1999) are some shade of orange, not pink or red as in the intergrade flickers.

Further, berries must be eaten when feathers are growing in for the color to be affected (Witmer 1996). Hatching-year flickers, such as the RRBO bird, replace primaries 3 through 10 after fledging (1 and 2 are replaced in the nest); the primary coverts, however, are retained (Pyle 1997). Primaries 6 and 5 and their corresponding coverts were red in the RRBO bird. If rhodoxanthin ingestion was responsible for the red coloration, berries would have had to have been fed to the bird in the nest as the coverts were forming, and then the bird would have had to eat more berries just as primaries 6 and 5 were growing in, a remarkable coincidence. While flickers do eat berries in the late fall and winter, parents provision their young primarily with insects (Moore 1995), and there would probably only be a limited supply of honeysuckle fruit at the time flickers are in the nestling stage.

Johnson (1969) proposed that the plumage traits in flickers have their genetic basis deep in the ancestral stock so that, for example, the red nape, black malar, and yellow feather shafts and flight feathers should perhaps not be considered YSFL traits, but flicker traits which are present in the majority of YSFL as well as a small percentage of RSFL. A certain amount of variation in these plumage traits should be considered "normal" for each type, rather than evidence of hybridization between the two forms.

Limited banding recoveries of YSFL indicate that hatching-year birds at least occasionally disperse some distance, since some individuals have been recaptured breeding in locations up to 277 km (~172 miles) from natal areas (Moore and Buchanan 1985). Therefore, it is possible that the bird banded at RRBO was a young fall migrant dispersing from the hybrid zone, which is approximately 1400 km (~870 miles) from southeast Michigan. However, given that this bird had a similar appearance as other eastern intergrades, which is inconsistent with the appearance of flickers from the hybrid zone, it is perhaps more likely this bird was a YSFL exhibiting traits that can be considered within the normal range for the type, rather than those of a hybrid.

Acknowledgments

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