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**A review of hybridization between *Sialia sialis* and *S. currucoides*.**—Hybridization between Eastern Bluebirds (*S. sialis*) and Mountain Bluebirds (*S. currucoides*) in Manitoba was first reported by Lane (Auk 85:684, 1968). Lane identified, observed and collected a hybrid male that had backcrossed polygynously with females of both species. The Eastern Bluebird female produced infertile eggs, but the Mountain Bluebird female laid two viable clutches. Lane suggested that hybrids were fertile only with *S. currucoides*.

Since the first record in 1967, 19 additional cross-breeding have been reported in Manitoba and one in Saskatchewan. Most have been reported anecdotally or incompletely in regional journals, but neither complete accounts nor a summary is available. Herein we review the existing records.

The 21 records include every combination of *S. sialis*, *S. currucoides* and hybrid except *S. sialis* male × hybrid and hybrid × hybrid (Table 1). Data show that hybrid males backcrossed equally to females of both species, but female hybrids have been observed backcrossed only to Mountain Bluebird males.

Mean clutch-size was  $5.25 \pm 0.87$  eggs for the 16 nests in which numbers of eggs were known. Clutch-size varied little among breeding pair combinations, as follows: hybrid male × *S. sialis* female:  $\bar{x} = 5.0$  (N = 3); hybrid male × *S. currucoides* female:  $\bar{x} = 5.7$  (N = 3); *S. currucoides* male × hybrid female:  $\bar{x} = 5.25$  (N = 4); *S. sialis* male × *S. currucoides* female:  $\bar{x} = 5.5$  (N = 2); *S. currucoides* male × *S. sialis* female:  $\bar{x} = 5.0$  (N = 3). Average clutch-sizes are generally smaller than the  $\bar{x}$  of  $5.7 \pm 0.58$  eggs recorded for 139 nests of Mountain Bluebirds in southwestern Manitoba (Munro et al., Auk 98:181–182, 1981), but larger than those of Eastern Bluebirds in Manitoba ( $\bar{x} = 4.69 \pm 0.79$ , N = 16) (Rounds and Munro, unpubl.) and the eastern United States (Laskey, Bird-Banding 10:23–32, 1939; Peakall, Living Bird 9:239–255, 1970).

A hatching rate of 87% occurred in all nests with known numbers of eggs (Table 2). Fertility was high (94–100%) in all breeding pair combinations except hybrid males × Eastern Bluebird females, where only 5 of 15 eggs hatched in three separate nests. Reported hatching rate for undisturbed nests of Eastern Bluebirds was 92–98% (Peakall 1970). Fertility and hatching in cross-breeding pairs, therefore, compares favorably with normal pair performance.

All nests involving mixed pairs were located in southwestern Manitoba, except one near Saskatoon, Saskatchewan (Table 2, Fig. 1). The incidence of nests near Brandon doubtless reflects the density of nest boxes there, and the concentration of cross-breeding pairs in southwestern Manitoba coincides with the area of maximum overlap in the breeding ranges of the two species (Zeleny, The Bluebird, Indiana Univ. Press, Bloomington, Indiana, 1976). The Eastern Bluebird is apparently extending its range westward into Saskatchewan (Scott, Blue Jay 24:186–187, 1966; Ashdown, Blue Jay 24:187, 1966; Belcher, Blue Jay 24:187–189, 1966) and Alberta (Butot, Blue Jay 36:41, 1978).

Records of the number of nest boxes checked, bluebird pairs observed and cross-breeding pairs reveal considerable variation in population ratios between the two parent species (Table 1). As the number of nest boxes increased through time, the initially low populations of *S. sialis* and *S. currucoides* increased rapidly. Populations of Mountain Bluebirds, however, increased more rapidly than those of Eastern Bluebirds and early interspecific ratios near unity became heavily skewed toward Mountain Bluebirds. A significant decline in numbers of Eastern Bluebirds began in 1975, and recovery has not occurred. Mountain Bluebirds have remained plentiful, and, when data are adjusted to account for differences in number of nest boxes monitored, populations continue to increase.

TABLE 1  
RATIO OF *S. SIALIS* TO *S. CURRUCOIDES* AND THE INCIDENCE OF CROSS-BREEDING AND  
HYBRID BACKCROSSING IN MANITOBA

Year	No. boxes monitored	No. first-brood nests			Hybridizing pairs	
		<i>S. currucoides</i>	<i>S. sialis</i>	Ratio <i>S.c./S.s.</i>	N	% nests
1963	749	28	22	1.27	0	0
1964	740	50	29	1.72	0	0
1965	774	66	40	1.65	0	0
1966	801	79	47	1.68	0	0
1967	1200	160	55	2.91	1	0.47
1968	1400	242	60	4.03	0	0
1969	2100	350	65	5.38	0	0
1970	2400	435	113	3.85	2	0.37
1971	3000	508	135	3.76	3	0.46
1972	3500	715	175	4.09	5	0.56
1973	4100	825	150	5.50	1	0.10
1974	4355	950	160	5.94	3	0.27
1975	789	333	9	37.00	1	0.29
1976	1109	410	38	10.79	2	0.45
1977	941	405	33	12.27	0	0
1978	1092	552	10	55.20	0	0
1979	1000	473	27	17.52	0	0
1980	1059	334	12	27.83	1	0.29
Totals	31,109	6915	1180	5.86	19	0.24

Cross-breeding and hybrid backcrossing were not found in 9 of 18 years for which we have data. Mixed pairs account for 0.10–0.56% of all breeding pairs in those years when interbreeding occurred, suggesting that hybridizing is rare. Ten of the 18 pairings occurred between 1970 and 1974, when high populations of both species were present. The 18-year average ratio between parent species was approximately 6:1 in favor of *S. currucoides*, and the rate of mixed species pairings was 0.24% for 8114 pairs.

Only the original hybrid male has been described in detail (Lane 1968). This bird had mixed blue and red feathers on the breast, but had the blue back, wings and tail, and voice of *S. sialis*, and resembled *S. currucoides* in general behavior. The hybrid was intermediate in size between the two species. Lane's field notes indicate that all subsequent hybrid males were similar to the first in plumage.

Spear (Blue Jay 33:231, 1975) reported a hybrid female with rusty-brown feathers scattered throughout the grey breast. Spear (pers. comm.) indicated that all three hybrid females that he had seen were similar in general appearance and resembled female *S. currucoides* more than female *S. sialis*.

The 1980 hybrid female differed from those reported by Spear (1975) in that it resembled a Mountain Bluebird female with dull chestnut breast and flanks and a deeper blue on the back. In-hand the bird was seen to lack blue or grey in the head, neck and upper back, and to have no throat patch. The three juveniles from her first brood all had chestnut in the breast and flanks following the first plumage change. The five young of the second brood

TABLE 2  
CHARACTERISTICS AND LOCATIONS OF 21 CROSS-BRED OR HYBRID BACKCROSSED PAIRS OF *SIALIA* IN CANADA

Year	Pair		No. eggs	No. young	Location <sup>a</sup>	Reference
	male	× female				
1967	Hybrid <sup>b</sup>	× <i>S. currucoides</i>	7	6	Oak Lake	Lane 1968
	Hybrid	× <i>S. sialis</i>	5	0	Oak Lake	Lane 1968
1970	<i>S. sialis</i>	× <i>S. currucoides</i>	—	4	Carberry	Lane and Knoek, Blue Jay 29:209, 1971
	<i>S. sialis</i>	× <i>S. currucoides</i>	6	6	Kenton	Lane and Knoek 1971
1971	<i>S. currucoides</i>	× <i>S. sialis</i>	—	4	Kennay	Lane and Knoek 1971
	<i>S. sialis</i>	× <i>S. currucoides</i>	—	3	Kenton	Lane and Knoek 1971
	Hybrid	× <i>S. sialis</i>	6	1	Routledge	Lane and Knoek 1971
1972	<i>S. sialis</i>	× <i>S. currucoides</i>	6	6	Glenboro	Lane and Bauman, Blue Jay 30:226-227, 1972
	Hybrid	× <i>S. currucoides</i>	5	5	Carberry	Lane and Bauman 1972
	<i>S. sialis</i>	× <i>S. currucoides</i>	—	3	Griswold	Lane and Bauman 1972
	Hybrid	× <i>S. currucoides</i>	5	5	Griswold	Lane and Bauman 1972
	<i>S. sialis</i>	× <i>S. currucoides</i>	5	5	Griswold	Lane and Bauman 1972
1973	Hybrid	× <i>S. sialis</i>	4	4	Shilo	Lane and Martin, Blue Jay 31:235-236, 1973
1974	<i>S. currucoides</i>	× <i>S. sialis</i>	—	2	Grande-Clairiere	Lane and Burton, Blue Jay 32:238-239, 1974
	<i>S. currucoides</i>	× <i>S. sialis</i>	4	4	Sidney	Lane and Burton 1974
	<i>S. sialis</i>	× <i>S. currucoides</i>	—	4	Shilo	Lane and Burton 1974
	<i>S. currucoides</i>	× <i>S. sialis</i>	5	5	Saskatoon, Sask.	Houston, Blue Jay 32:240-241, 1974
1975	<i>S. currucoides</i>	× <i>S. sialis</i>	6	6	Russell	Lane and Black, Blue Jay 33:243-245, 1975
1976	<i>S. currucoides</i>	× Hybrid	6-5-3 <sup>c</sup>	6-5-4 <sup>unk.</sup>	Russell	Lane et al., Blue Jay 34:208-209, 1976
	<i>S. currucoides</i>	× Hybrid	5	5	Russell	Lane et al. 1976
1980	<i>S. currucoides</i>	× Hybrid	unk.-5 <sup>e</sup>	3-5 <sup>d</sup>	Lyleton	New record

<sup>a</sup> All locations are in Manitoba, with the single noted exception.

<sup>b</sup> Polygynous male.

<sup>c</sup> First, second and third clutches.

<sup>d</sup> First and second broods.

<sup>e</sup> First and second clutches.

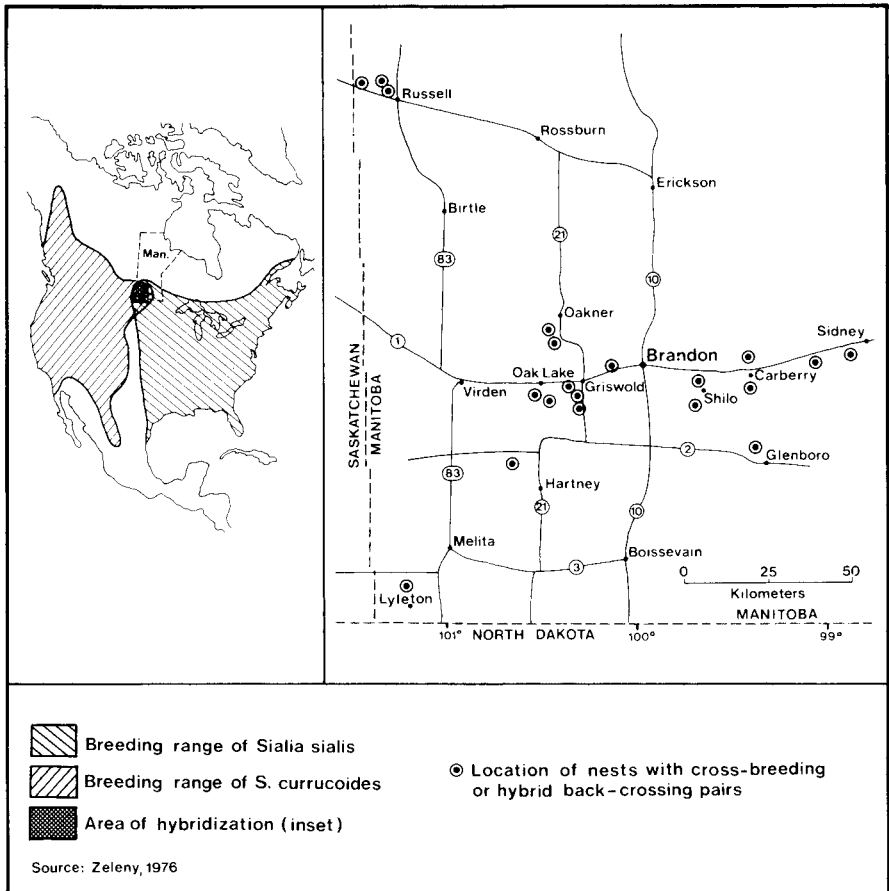


FIG. 1. Breeding ranges and the location of cross-breeding and hybrid backcrossing pairs of *Sialia* in North America.

resembled *S. currucoides* juveniles, without obvious intermediate plumage. We observed the fledging of the second brood and the adults were assisted in feeding the fledglings by the first brood.

Characteristics of the hybrids are clearly combinations of the two parent species, and a gradual geographic transition in characters from one form to another is not evident. In the absence of evidence of dominance in cross-breeding or introgression, we see no grounds to combine *S. currucoides* and *S. sialis* as a single species. The confinement of hybridization to the small area where breeding ranges overlap is not uncommon in birds, and the rarity of hybridization within this zone suggests that genetic exchanges are minimal between the parent populations.

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**Interspecific plumage similarity: the Mockingbird and Loggerhead Shrike.**—

Interspecific deception may be widespread in animals. For example, avian vocal mimics often produce sounds similar to those of large, aggressive or predatory species, and such mimicry might dissuade rivals from living in that locality by making it appear to be inhabited by predators and/or competitors (Rechten, *Anim. Behav.* 26:305–306, 1978). We suggest that the Mockingbird (*Mimus polyglottos*) exhibits plumage similarity with a predator, the Loggerhead Shrike (*Lanius ludovicianus*). The Mockingbird looks very much like a shrike, the two species being of similar size, although the shrike is somewhat chunkier. Even Robbins' bird guide states that the shrike is "often confused with the mockingbird" (Robbins et al., *Birds of North America*, Golden Press, New York, New York, 1966). Plumage similarities include gray back, lighter breast, white patches on the wings and dark gray tail edged with white. The chief differences are more subtle: the shrike has a black line through the eye and a hooked bill. Both commonly use elevated perches in open habitat. Hailman (*Wilson Bull.* 72:106–107, 1960) observed Barn Swallows (*Hirundo rustica*) mobbing a Mockingbird and suggested that the swallows mistook the Mockingbird for a shrike.

The similarity between these two species might be considered a case of mimicry in which selection favored Mockingbirds that looked like the predaceous shrike. Almost complete range overlap occurs for the two species. However, outside the shrike's range other mockingbird species occur that are very similar in plumage to *M. polyglottos*, e.g., Tropical Mockingbird (*M. gilvus*), Patagonian Mockingbird (*M. patagonica*) and White-banded Mockingbird (*M. triurus*). Therefore, we think that the similarity between *M. polyglottos* and *L. ludovicianus* is not a result of selection for plumage resemblance.

The Mockingbird is well known for its pugnacity in defending year-round territories (Bent, *U.S. Natl. Mus. Bull.* 1948). Apparently, Mockingbirds face intense interspecific competition in winter with other frugivores and sometimes respond aggressively to them (Moore, *Behav. Ecol. Sociobiol.* 3:173–176, 1978). No studies have investigated interspecific competition during the breeding season. We hypothesize that despite the origins of plumage similarity of Loggerhead Shrikes and Mockingbirds, the Mockingbird may benefit from the similarity because other species are sometimes deceived by the resemblance, reducing the probability of their remaining in an area so populated with "predators." Perhaps other cases of resemblance that have been considered mimicry may simply be the outcome of convergent evolution.

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**Head wind promotes skimming in Laughing Gulls.**—The evolutionary origin of skimming behavior in skimmers (Rynchopidae) such as the Black Skimmer (*Rynchops niger*) is uncertain. Observations of the occurrence and conditions promoting similar behavior in