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Comments on Nebraska's Falconiform and Strigiform bird fauna*

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Owing to a lack of long-term survey data, determining whether Nebraska's raptor numbers are stable, increasing, or decreasing is difficult. Unlike our relatively well-monitored gamebirds, no regular surveys have been performed, and raptors barely register on the state's Breeding Bird Surveys or Christmas Bird Counts, owing to their relative rarity. However, a few data-points of interest do exist, which might be worth summarizing.

In one of the first multi-year surveys of Sandhills avifauna, H. Elliott McClure (1966) summarized raptor abundance data based on three years of study in the Nebraska Sandhills (1941-1944). During that period, he typically drove from a ranch near Ord to Valentine National Wildlife Refuge each Thursday, returning on Friday or Saturday, and driving 350 miles round trip. On these trips he tallied all the larger birds seen, including raptors. He summarized these data as birds seen per day, but they have here been converted to relative percentage abundance of species, to facilitate comparisons (Table 1).

In 1959 John and Ann Mathisen published a population study of diurnal raptors in the Panhandle, based on one year (1957) of roadside surveys. They traveled 17,807 miles over a year-long period, making surveys on 128 days that included counts made every month, from as few as 6 to as many as 15 days per month. Their findings provide an invaluable snapshot of the species composition and relative abundance of the Panhandle's hawks, falcons, and eagles as they existed in the 1950's. Their data are also summarized in Table 1. A somewhat similar but much more limited winter roadside survey was later made by Shupe and Collins (1983) in southeastern Nebraska.

From 1970 to early 1972 Ross Lock and other Game and Parks personnel did roadside raptor surveys throughout the state, driving 67,368 miles in 1970-71, and 55,710 miles in 1971-72. These data were presented in Lock's reports as birds-per-100 or birds-per-10,000 miles. Actual numbers seen were not provided for both years,

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although in 1970-71 a total of about 2400 identified hawks, falcons, and eagles were seen. Probably similar numbers were seen the following year, so that this database might approach 5,000 birds. Counts were made in all seasons, and throughout the state, but mostly in southeastern Nebraska and the Panhandle. The combined data are shown in Table 1; regional and seasonal analyses were provided in the original reports.

For 25 years Raptor Recovery-Nebraska has been caring for and releasing injured and orphaned birds of prey brought to its headquarters near Lincoln. Most of these birds have come from eastern Nebraska, providing a sample of raptor populations biased toward the eastern part of the state, and supplementing the other data (see Table 1, "RR-Neb."). Unlike the previous summaries, owls are included in the database, which presently extends from 1976 through 2000.

Lastly, we have an increasing number of state-wide breeding records for raptors, as compiled by Ducey (1988) and Mollhoff (2001), and recently summarized by Canterbury and Johnsgard (2000). They encompass the period from approximately 1900 to 1988, and are collectively shown in summary form in Table 1 ("State Nesting Records"), using the collective numbers of breedings reported by Canterbury and Johnsgard.

Discussion

It is apparent that the raptor compositions in the Panhandle and Sandhills are (or at least historically were) quite different from the eastern regions and from the state as a whole, with golden eagles, ferruginous hawks and rough-legged hawks especially typical of the high plains of the Panhandle, and northern harriers and American kestrels particularly abundant in the Sandhills. Peregrines were evidently more common in the Panhandle during the 1950's than one would have predicted; and perhaps some of the birds identified as peregrines by the Mathisens were actually prairie falcons, which curiously did not appear on their list. It is interesting that McClure saw no red-tailed hawks in his Sandhills surveys; even today red-tails are far rarer than Swainson's hawks in the central Sandhills, where there are too few adequately large trees for nesting. Clearly, bald eagles have become more common statewide in the past few decades. On the other hand, there are fewer recent state records for red-shouldered hawks than one would have predicted, but both the red-shouldered and broad-winged hawks have now essentially been extirpated from Nebraska. Additionally the data of Lock suggest that accipiters are rarer than they actually are, as these birds are rarely seen from roadsides. His numbers for red-tailed hawks seem unaccountably low.

Comparing Raptor Recovery records with the Nebraska breeding records, it is obvious that several species recorded by Raptor Recovery efforts do not appear among the breeding data (e.g., snowy and northern saw-whet owls, rough-legged hawk), as their breeding ranges fall outside the state. Bald eagles appear in Raptor Recovery statistics

more often than the other abundance data would predict, but northern harriers have appeared far less frequently. Additionally, it is interesting that the two most abundant hawks (red-tailed and American kestrel) and the corresponding two owls (great horned owl and eastern screech-owl) each are about equally common; and in both cases the two species comprise 60-80 percent of the total hawk or owl sample. Furthermore, each of these two species pairs represents a large, generalized and powerful rodent-eater, and a considerably smaller generalist that consumes a mixture of small rodents (mainly in winter) and (in summer) large insects. Collectively, these two ecological counterpart birds reduce their competition and divide their food base by having different periodicities of hunting activities.

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Table 1 : Species composition of Nebraska's raptors from five comprehensive surveys, 1900-2000. Species composition was calculated as a percentage of all reports within a survey; the actual number of each species is shown in parentheses.

Species	Sandhills* Mathisens (1941-44)	Panhandle** McClure (1957)	State*** Locke (1970-72)	State RR-Neb. (1976-2000)	State Nesting Records (1900-88)
Hawks	N=?	N=546	N=?	N=2566	N=1004
Osprey		.18%	.03%	.67% (17)	0
Mississippi Kite				.23% (6)	0
Northern Harrier	36.4%	29%	27.3%	2.7% (69)	9.4% (94)
Bald Eagle	.8%	.18%	3.0%	4.1% (105)	.90%
Sharp-shinned		.18%	.005%	3.0% (76)	1.1% (11)
Cooper's			.2%	1.3% (34)	2.9% (30)
Northern Goshawk			.005%	.19% (5)	0
Red-shouldered			2.6%	.04% (1)	.70% (7)
Broad Winged				.66% (17)	.40% (4)
Swainson's	10.6%	4.3%	0.0%	5.3% (138)	17.3% (174)
Red-tailed		3.5%	11.5%	39.1% (1003)	29.7% (298)
Ferruginous	4.9%	.7%	0.5%	1.4% (35)	2.2% (22)
Rough-legged	10.2%	25%	8.1%	3.0% (77)	0
Golden Eagle	2.8%	11.5%	1.2%	3.2% (81)	4.0% (40)
American Kestrel	32.2%	20%	36.1%	31.2% (800)	28.0% (282)
Merlin		.18%	.03%	1.4% (37)	.60% (6)
Prairie Falcon	1.9%		.6%	2.0% (52)	2.6% (26)
Peregrine Falcon		4.3%		47% (12)	.1% (1)
Gyrfalcon				.04% (1)	0
Owls				N=2517	N=715
Barn				5.8% (149)	11.3% (81)
Eastern Screech-				42.2%(1086)	20.0% (150)
Great Horned				42.5%(1092)	41.1% (294)
Snowy				.54% (14)	0
Burrowing				.58% (15)	14.8% (106)
Barred				2.9% (76)	4.2% (30)
Long-eared				2.9% (76)	3.2% (23)
Short-eared				11.9% (50)	4.3% (31)
Northern Saw-whet				.51% (13)	0

* Total numbers of birds seen were not indicated; percentages were calculated indirectly.

** Excludes unidentified raptors and turkey vultures; Krider's hawk included with Red-tailed hawk.

*** Total numbers of birds seen were not indicated, and too few owls were seen to include. Excludes unidentified raptors and turkey vultures; Krider's hawk included with Red-tailed hawk.