

# SWAINSON'S HAWK PRODUCTIVITY AND FIVE-YOUNG NEST

C. STUART HOUSTON, 863 University Drive, SK S7N 0J8

This is an account of a long-term study, but is also a story about four elements of incredibly good fortune.

Imagine initiating a study of the Ferruginous Hawk, which led to an even larger study of the Swainson's Hawk. Imagine what an impetus Jean Harris has given my hawk-banding program, finding 729 Swainson's Hawk nests, thereby propelling me into top spot among Swainson's Hawk banders. Imagine following this hawk through 12 consecutive years of excellent productivity, three years of good productivity, ten years of poor productivity, and then having the satisfaction of productivity in 1997 suddenly jumping back to equal the "good old days." And, especially imagine the excitement, in 1997, when Jean found the world's first recorded nest with five healthy nestlings almost ready to fledge. It was one of the most exhilarating experiences in 55 years of banding.

I like to say that when things go well, it reflects good management and when things go badly, that is bad luck. But when it comes to Swainson's Hawk and Jean Harris, I am the first to admit to being just plain lucky.

I did not plan a long-term study, I stumbled into it. In 1969, concerned about the drastically retracting range of Ferruginous Hawk in Saskatchewan, I encouraged my sub-permittee, Doug Whitfield, to check out a few former Ferruginous Hawk locations, west of Kindersley, that Glen A. Fox had reported in 1960. Doug went to four nests and had unexpected success: two nests

had five young and two others had four young each. Although Ray Salt at Rosebud, AB, had mapped the migration routes and wintering grounds of Alberta Ferruginous Hawks in the 1930s,<sup>8</sup> nothing was known of the movement of Saskatchewan birds. Ferruginous Hawk banding has been an annual event ever since Doug's first success<sup>3</sup>.

The next bit of luck concerned the time and place of the weekend camp of the Kindersley Boy Scouts, the only year we crossed paths at banding time. On 17 June 1972, when checking Ferruginous nests on the Kindersley-Elna PFRA Pasture, we saw that the solitary tree in the ravine near Teo Lake had an active pair of hawks. The Boy Scouts tents were 300 m away. Here was an opportunity to enrich the scouts' experience, so I went over and asked whether the scouts wished to observe the banding operation. To my surprise the enthusiastic scout master turned out to be Keith Harris, who had grown up on a farm three miles south of my hometown of Yorkton. His first cousin had found a Great Horned Owl nest for me there in 1953. Better yet, Keith informed me that his wife, Jean, was interested in hawks and had a couple of Swainson's Hawk nests that I might wish to visit the following month. Thus, a chance encounter led to annual assistance from Jean in finding nests of both Buteo species; her Swainson's peaked at 62 nests in 1987 (Table 1).

## Swainson's Hawk productivity

Apart from one unexplained drop in nests found in 1976, Jean covered a

Year	Total nests	# nests success	# young banded	# nests failed	Ratio yg./successful nest	% Nests Successf
1972	3	2	4	1	2.00	66.67%
1973	7	5	11	2	2.20	71.43%
1974	9	6	14	3	2.33	66.67%
1975	11	6	13	5	2.17	54.55%
1976	2	1	3	1	3.00	50.00%
1977	15	10	25	5	2.50	66.67%
1978	17	14	41	3	2.93	82.35%
1979	19	15	38	4	2.53	78.95%
1980	15	9	19	6	2.11	60.00%
1981	20	17	33	3	1.94	85.00%
1982	26	24	50	2	2.08	92.31%
1983	47	32	59	15	1.84	68.09%
SUBTOT	191	141	310	50	2.20 Excellent production	73.82%
1984	35	20	36	15	1.80	57.14%
1985	38	32	67	6	2.09	84.21%
1986	41	38	81	3	2.13	92.68%
SUBTOT	114	90	184	24	2.04 Good production	78.95%
1987	62	49	80	13	1.63 lowest ratio ever	79.03%
1988	39	20	27	19	1.35 even lower	51.28%
1989	48	28	42	20	1.50 still low	58.33%
1990	47	34	50	13	1.47 still low	72.34%
1991	41	24	28	17	1.17 very low	58.54%
1992	47	29	40	18	1.38 still low	61.70%
1993	23	9	11	14	1.22 very low	39.13%
1994	26	25	47	1	1.88 best in 7 years	96.15%
1995	35	30	42	5	1.40 low again	85.71%
1996	28	16	27	12	1.69 better than Mantario	57.14%
SUBTOT	396	264	394	132	1.49 poor production	66.67%
1997	28	26	62	2	2.38 like old times	92.86%
TOTAL	729	521	950	208	1.82 young/ successful nest	71.47%

**Table 1.** Swainson's Hawk nests found by Jean Harris, Kindersley area, SK

wider area each year and found more and more nests. Like us, Jean is careful not to go near a Swainson's Hawk nest early in incubation. Only in mid-June are nesting pairs watched and then only from a distance, for fear of nest desertion. As a result we have no statistics on early nest desertion. During the first 14 years, from 60 to 90% of Jean's known pairs were successful in a given year, and productivity was more than two young per successful nest. From 1984 to 1986 this figure fell to almost exactly two per nest.

The next ten years, 1987 to 1996

showed more nest failures and declining productivity to only 1.17 young per successful nest in 1991 and 1.22 in 1993. Mid-breeding nest failures rose to an all-time high of 61% in 1993.

Another check on productivity is to graph the number of nests, province wide, with one, two, three and four young (Figure 1). From 1944 to 1994, only 19% of 3039 banded young were produced in nests with only one young<sup>4</sup>. The percentage of nests raising only one young to banding age, the solid black line on the graph, was 20% in the first 12 years, then rose to 50% or more

# Swainson's Hawks, Saskatchewan

## Percent of Nests with 1, 2, 3, or 4 young

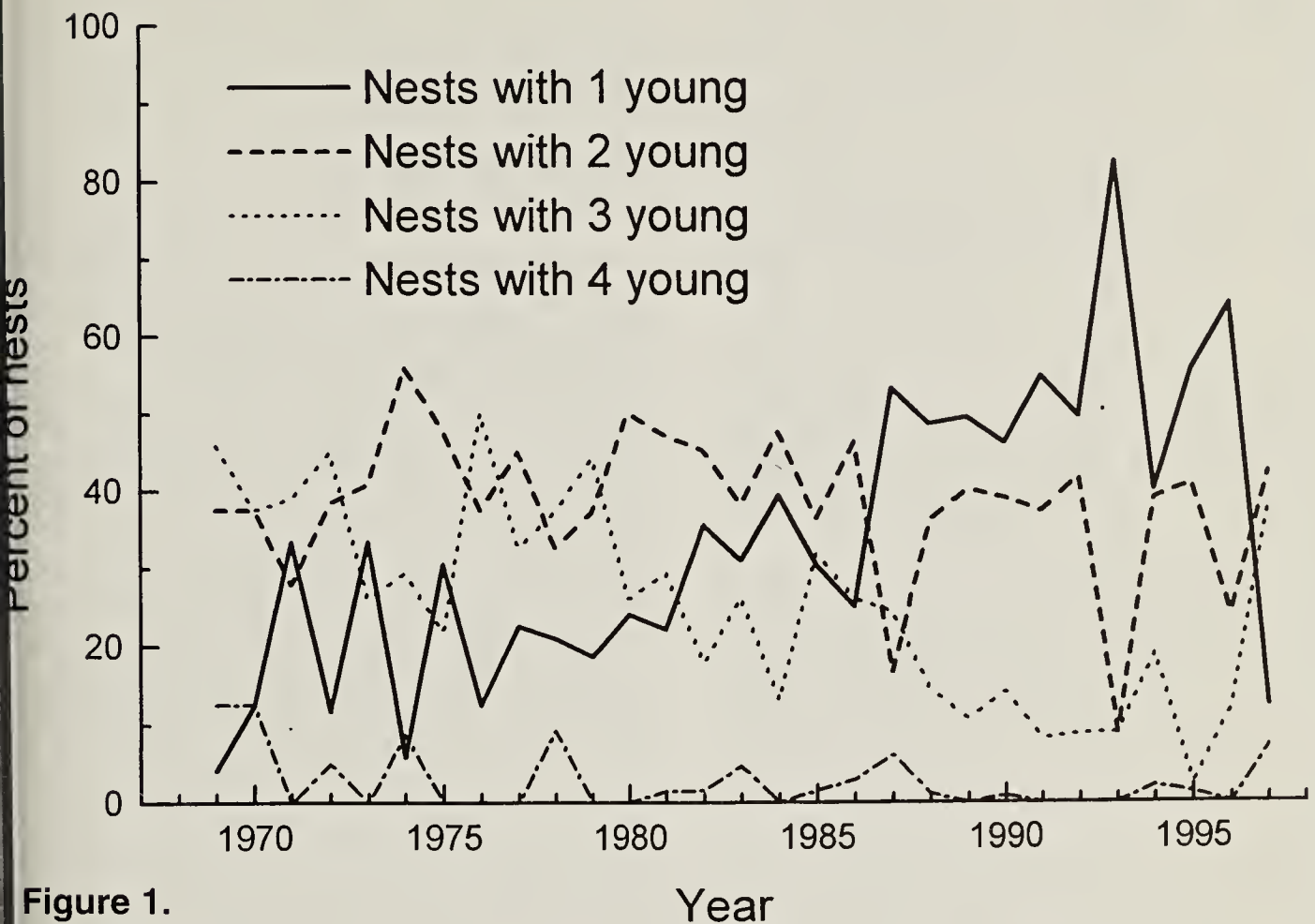


Figure 1.

from 1987 to 1996; peaking at 82% in 1993. Yet in 1997 this figure dropped back suddenly to 10%.

### Swainson's Hawk Populations

Between 1987 and 1996, the number of nesting pairs dropped by approximately 50%. A similar approximately 50% drop occurred at Hanna, Alberta between 1989 and 1996. An even more drastic drop occurred in southwestern Saskatchewan (Josef K. Schmutz, mss., and Wayne C. Harris, pers. comm.).

### Speculation

Grassland fragmentation no doubt has contributed to productivity declines in the Ferruginous Hawk and Burrowing Owl, but the Swainson's Hawk is much less a grassland specialist. Changing farm practices and chemical

usage may be contributing causes. Ian Newton's wonderful "Population Ecology of Raptors" perhaps offers the best explanation: "almost every aspect of the natural population ecology of a given raptor species can be explained in terms of food."<sup>6</sup> The ten-year drop in numbers of Swainson's young per successful nest was accompanied by a drastic decline in numbers of Richardson's Ground Squirrel (RGS), a widespread phenomenon throughout the grasslands of southern Alberta and Saskatchewan. Our best guess is that numbers of RGS at Kindersley dropped below 5%, perhaps 2% of their former numbers; which were everywhere considered "superabundant" in the 1970s<sup>7</sup>. A similar RGS crash was not evident in parkland areas of Saskatchewan. One possible, partial, explanation of the ground squirrel decline was the appearance of the Red Fox, both at Luseland to the north

and Kyle to the southeast, in the mid 1960s, with subsequent dramatic increases<sup>2,5</sup>.

RGS roadkills were common from 1950 to 1987. In over 10,000 km of travel each year, between 1992 and 1995, inclusive we saw only one such roadkill, whereas up to 3 Red Fox roadkills were encountered in one day. From 1992 through to 1996, days without a single RGS sighting were commoner than days without a Red Fox sighting. RGS numbers appeared to bottom out in 1993. By 1996 and 1997 there were increasing numbers of small pockets of RGS, sparingly distributed. The largest groups in 1996 being 20 near Hillsburgh Pasture Headquarters south of Brock and another nine near Laporte, on 21 June. These increases seemed insufficient to explain the sudden improvement in productivity in 1997. However, voles, which proliferated everywhere in southern Saskatchewan in 1997, offer at least a partial explanation. Vole numbers rivalled the years 1960 and 1969; all three springs followed

some of the wheat and other crops lying unharvested all winter under the early snow. Although not reflected in prey remains in nests by banding time, this abundant food supply may have helped both species of Buteo get off to a good start in 1997.

### Five-young nest

A thorough literature search revealed a single report of a five-egg clutch in 1915, classed as questionable, and no reports of five young<sup>1</sup>. Hence it was a surprise on 23 July when we followed Jean Harris's directions to a nest alongside Highway 21, south Kerrobert, to find five healthy young Swainson's Hawks. The nest was 4.3 m above ground in a Manitoba Maple, along the north edge of a farm shelterbelt, and, in spite of the large brood we found two Richardson's Ground Squirrel skins in the nest. One adult was erythristic (reddish plumage) and one light. All five young were similarly erythristic and nearly ready to fledge: indeed one flew five m and was replaced in the nest. This appears to



*Five Swainson's Hawks in one nest.*

*Jean Harris*

be the world's first recorded Swainson's Hawk nest with five young.

1. ENGLAND, A.S., M.J. BECHARD, and C.S. HOUSTON. 1997. Swainson's Hawk (*Buteo swainsoni*). In *The Birds of North America*, No. 265 (A. Poole and F. Gillis, eds.). The Academy of Natural Sciences, Philadelphia, PA and the American Ornithologists Union, Washington, D.C.

2. FINLEY, K. 1996. The Red Fox invasion and other changes in wildlife populations in west-central Saskatchewan since the 1960s. *Blue Jay* 54:206-210.

3. HOUSTON, C.S. 1995. Thirty-two consecutive years of reproductive success at a Ferruginous Hawk nest. *J. Raptor Res.* 29:282-283.

4. HOUSTON, C.S. and J.K. SCHMUTZ. 1995. Declining reproduction among Swainson's Hawks in prairie Canada. *J. Raptor Res.* 29:198-201.

5. JORDHEIM, S.J. 1995. Foxes in south-central Saskatchewan. *Blue Jay* 53:232-233.

6. NEWTON, I. 1979. Population ecology of raptors. Buteo Books, Vermillion, S.D.

7. ROTHFELS, M. and M.R. LEIN 1983. Territoriality in sympatric populations of Red-tailed and Swainson's Hawks. *Can. Zool. J.* 61:60-64.

8. SALT, R. 1939. Notes on recoveries of banded Ferruginous Rough-legged Hawks (*Buteo regalis*). *Bird-Banding* 10:80-84.



Mariposa Lily - Waterton Lakes National Park

Teresa Dolman