

Saskatchewan Swainson's Hawks

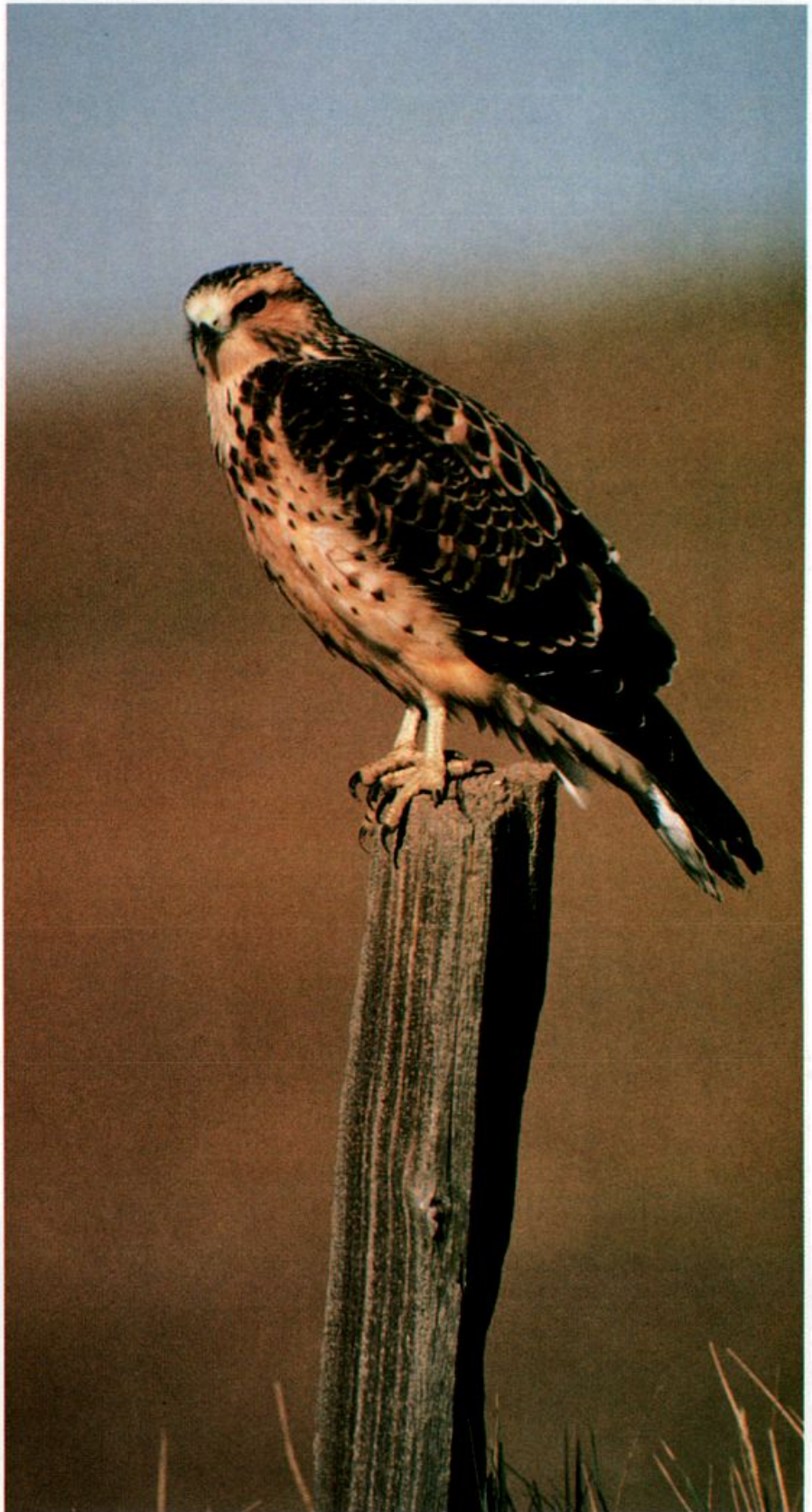
C. Stuart Houston

FOR FORTY YEARS I HAVE BEEN involved in studies of Swainson's Hawk (*Buteo swainsoni*) in Saskatchewan, where its history, and that of its chief prey species, began. Swainson's Hawks travel 14,000 miles in their round-trip migration, including substantial distances travelled without food. Recoveries from Swainson's Hawks I have banded first placed the species on the official Alabama list, and now outline the timing and course of the migration to Argentina. They also raise interesting questions concerning the whereabouts of year-old hawks.

History

Both Swainson's Hawk and the main prey species brought to its nestlings, Richardson's Ground Squirrel (*Spermophilus richardsonii*), were first described from Fort Carlton, 50 miles north of Saskatoon, by Dr. John Richardson. The originals, 160-year-old handwritten journals of the happenings at this and other forts, are preserved in the Hudson's Bay Company Archives in Winnipeg, where I have unearthed important dates of Richardson's itinerary. When John Richardson, surgeon and naturalist with both of Franklin's Arctic Exploring Expeditions in the 1820s, made a 250-mile side trip from wintering quarters at Cumberland House to Carlton in the spring of 1820 (Houston 1984), among the birds and mammals he collected was the type specimen of Richardson's Ground Squirrel (Sabine 1823, Richardson 1829).

Carlton impressed Richardson as one of the finest places for bird watching in North America, and he returned there during the Second Franklin Expedition, 1825-27, making one of the most remarkable journeys of any



"We don't fully understand why Swainson's Hawks make a 14,000 mile round trip from the grasslands of Saskatchewan, to Argentina, and back again. Is it worth four months of travel every year?" Photograph/B.K. Wheeler/VIREO (W13/1/058).

bird watcher before or since. He left Fort Resolution on Great Slave Lake on Christmas Day in 1826, stopped at Fort Chipewyan on Lake Athabasca from January 3 to 8, and arrived at Carlton on February 12, 1827, well in advance of the spring migration he came to observe. His assistant naturalist, Thomas Drummond, came from his collecting station on the slopes of the Rocky Mountains near Jasper, to reach Carlton on April 5. To meet there Richardson walked 900 miles and Drummond 600 miles, in the depth of winter, camping out in temperatures sometimes below -40° . Richardson chose his locality well: Carlton is where the aspen parkland and mixed forest meet, and a modern Breeding Bird Survey, in nearly identical habitat at Turtle Lake, less than 100 miles west-northwest of Carlton, now regularly records the highest species diversity of any route in North America (S. Droege, pers. comm.).

Drummond collected a female Swainson's Hawk on May 22, and a male on June 17, 1827, at nests near Carlton. Both were described by Richardson and one was illustrated by artist William Swainson in *Fauna Boreali-Americana*, Vol. 2 (1832). Although both Richardson and Audubon (1837) had considered this bird conspecific with *Buteo vulgaris*, the Common Buzzard of Europe, Charles Lucien Bonaparte recognized the priority of these speci-



The 1829 Swainson's Hawk illustration by William Swainson, from *Fauna Boreali-Americana*, Vol. 2 (1832).

mens in 1838 and named the species *Buteo Swainsoni*.

Because Bonaparte's brief list for convenience gave Audubon's 1837 plate number for every species, the type locality in the A.O.U. *Check-list* is given as Fort Vancouver, Washington, based on Audubon's Plate 372. Carlton was thereby "robbed" of its rightful honor of being the official type locality for Swainson's Hawk.

In the 1820s, when bison were common on the plains and grassland fires occurred annually, both Swainson's and Ferruginous hawks (*Buteo regalis*) had a much wider distribution. With settlement, grading of roads, and control of fires in the early 1900s, copses or "bluffs" of aspen filled in the grassland to form what is called the "parkland region." (Houston and Bechard 1983, 1984). By about 1950, the Ferruginous Hawk had disappeared from the Carlton area and Swainson's Hawk had been largely supplanted by the Red-tailed Hawk (*Buteo jamaicensis*) (Houston and Street 1959). While some Swainson's Hawks have adapted to using grainfields, they have higher reproductive success in their preferred but diminishing habitat of unbroken grassland.

Food

Swainson's Hawk and Richardson's Ground Squirrel are typical grassland species. Range maps in the *Atlas of Alberta* are identical for the two species (Wonders 1969). In Saskatchewan, similarly, all known Swainson's nesting localities have Richardson's Ground Squirrels present.

Since 1964, I have recorded uneaten prey items found in Swainson's Hawk nests. Richardson's Ground Squirrel is by far the commonest food brought to nestling Swainson's Hawks, almost as numerous (147 of 319) as all other items combined. In 1974, when Richardson's Ground Squirrels were particularly abundant, they constituted 79% of prey items (19 of 24). However, grasshoppers constitute an important food source in Saskatchewan for groups of nonbreeding Swainson's Hawks in summer and for flocks gathering before their fall migration.

Migration and Banding Results

I have watched Swainson's Hawks with interest since my boyhood in



"My own banding results have provided a picture of the complete migration process." Photograph/B.K. Wheeler/VIREO (W1311024).

Yorkton, Saskatchewan. There they arrived each year in early May, and most had left by late August. Only after moving to Saskatoon in 1960 did I see the impressive pre-migration fall groupings of 50 to 200 individuals, perching on almost every fencepost along the road, or feeding on grasshoppers in the fields.

In the year I began banding birds, *Bird-Banding* published the first-ever Argentina recovery of a Swainson's Hawk banded in North America (Cooke 1943). Banded as a nestling on a farm near Macrorie, Saskatchewan ($51^{\circ} 10' N$, $107^{\circ} 00' W$) on July 21, 1940, by F. J. Hartley Fredeen, it was shot at Estancia "Los Alfelfores," Córdoba, Argentina, on December 23, 1941. It was one of three Swainson's Hawk recoveries from 1400 individuals of 49 species banded by Fredeen before his University studies in entomology took precedence over his banding (Houston 1968a).

My own banding results (74 recoveries to date, or 3.3% of the 2,218 Swainson's Hawk nestlings banded) (Tables 1, 2, 3), have since provided a picture of the complete migration process. Early Saskatchewan banding demonstrated the expected pattern of southward migration through eastern Montana, North and South Dakota, Nebraska, Oklahoma, and Texas (Houston 1968b). As an exception, in October 1946 my first Swainson's

Table 1. North American Recoveries of Houston-banded Swainson's Hawks (all banded within Saskatchewan)

Band #	Banding Data			Recovery Data				Distance		Locality Where Found
	Date	Locality	Latilong	How Killed	Date	Latilong	km	degr		
Recovered in Alberta:										
1.	727-03871	28 July 79	S of Young	513-1054	FdDd	2y Oct/81	512-1130	509	271	Carbon
2.	987-42134	8 July 83	N of Maple Creek	500-1092	Car	Dir 30 Aug/83	495-1101	63	253	Irvine
3.	987-42135	8 July 83	N of Maple Creek	500-1092	Hiwy	Dir 21 Aug/83	495-1100	51	249	Walsh
4.	987-27491	14 July 79	N of Kindersley	513-1090	Recp	6y 4 Aug/85	513-1115	196	271	16 km S, 4E of Hanna
					Sght	10y July 89	513-1115	196	271	16 km S, 4E of Hanna
5.	987-28505	24 July 81	W of SwiftCurrent	501-1075	Recp	5y 6 Aug/86	512-1115	310	296	18kmS, 3E of Hanna
					Sght	7y July 88	512-1115	310	296	18kmS, 3E of Hanna
6.	987-46012	21 July 85	Smiley	513-1092	Recp	3y 26 July 88	511-1120	189	260	25 km S, 8 W of Hanna
Recovered in Saskatchewan:										
1.	637-97326	10 July 66	Bradwell	515-1061	Shot	Dir 7 Aug 66	515-1061	0	0	Bradwell
2.	637-97316	5 July 66	Vanscoy	520-1065	Shot	Dir 13 Aug 66	520-1063	23	90	Saskatoon
3.	847-90184	13 July 69	Bladworth	512-1060	FdDd	Dir 28 July 69	512-1060	0	0	N of Bladworth
4.	787-85414	2 Aug 69	Wakaw	523-1054	Shot	Dir 22 Aug 69	523-1054	0	0	4 mi S of Wakaw
5.	847-90170	6 July 69	S of Venn	512-1051	Hiwy	2y 2 May 72	513-1050	22	32	3 mi W of Nokomis
6.	617-22200	14 July 74	E of Golden Prairie	501-1092	FdDd	Dir 17 Aug 74	501-1092	0	0	20 mi N of Maple Creek
7.	617-22135	21 July 73	E of Flaxcombe	512-1092	Trap	2y Oct 75	495-1034	434	110	6 mi W of Osage
8.	727-04635	25 July 74	E of Saskatoon	520-1062	Hiwy	Dir 12 Aug 74	515-1062	1	90	1 mi E of Clavet
9.	727-04637	25 July 74	E of Saskatoon	520-1062	Hiwy	Dir 12 Aug 74	515-1062	1	90	1 mi E of Clavet
10.	617-22056	19 July 72	N of Rosetown	514-1075	FdDd	3y 1 May 76	523-1092	138	313	2 N, 3 E of Winter
11.	617-22191	7 July 74	W of Girvin	510-1060	FdDd	3y 11 Aug 77	512-1061	39	343	2W, 5S of Kenaston
12.	987-27410	15 July 78	N of Kindersley	513-1090	Elct	Dir 21 Aug 78	512-1090	19	0	Kindersley
13.	987-27449	16 July 78	W of Stewart Valley	503-1075	Car	Dir 26 Aug 78	503-1075	0	0	3 mi W of Stewart Valley
14.	617-22183	13 July 74	E of Flaxcombe	512-1092	FdDd	6y 26 Nov 80	513-1094	30	309	10 mi NW of Flaxcombe
15.	577-29757	6 Aug 80	Saskatoon	520-1063	Hiwy	Dir 15 Sep 80	515-1063	19	0	10 mi N of Dundurn
16.	987-40943	31 July 81	N of Val Marie	492-1074	Car	Dir 24 Aug 81	492-1074	0	0	10 mi N of Val Marie
17.	987-40917	25 July 81	N of Kindersley	513-1090	Hiwy	Dir 31 Aug 81	513-1090	0	0	4E, 6N of Kindersley
18.	987-25094	16 July 77	N of Kindersley	513-1090	Hiwy	4y 18 May 82	521-1090	74	0	12 mi S of Unity
19.	987-41234	24 July 82	N of Kindersley	513-1090	Hiwy	Dir 22 Aug 82	513-1090	0	0	6 N, 1 E of Kindersley
20.	987-41258	25 July 82	Flaxcombe	512-1093	FdDd	Dir 16 Oct 82	512-1092	12	90	10 W of Kindersley
21.	987-42004	23 July 83	Doddsland	514-1085	Hiwy	Dir 13 Aug 83	513-1090	22	212	6E, 9N of Kindersley
22.	987-42010	23 July 83	N of Netherhill	513-1085	Hiwy	Dir 5 Sep 83	512-1090	22	212	near Kindersley
23.	987-24562	23 July 84	S of Nokomis	512-1050	Car	Dir 20 Aug 84	512-1050	0	0	10 mi S of Nokomis
24.	987-24504	21 July 84	N of Netherhill	513-1085	Hiwy	Dir 15 Aug 84	513-1085	0	0	6 mi N of Netherhill
25.	987-24595	4 Aug 84	Saskatoon	520-1063	Hiwy	Dir 15 Aug 84	515-1063	19	0	10 mi S of Saskatoon
26.	987-24663	20 July 85	N of Kindersley	513-1090	Hiwy	Dir 4 Oct 85	512-1090	19	0	near Kindersley
27.	727-04473	20 July 80	Wartime	511-1081	Elct	5y 5 Oct 85	514-1092	98	305	6 N of Smiley
28.	987-24653	20 July 85	N of Kindersley	513-1090	Hiwy	Dir 10 Sep 85	515-1090	37	0	5 mi S of Kerrobert
29.	987-46051	27 July 85	N of Hoosier	514-1094	Hiwy	Dir 14 Sep 85	513-1092	30	129	5 S of Smiley
30.	987-46052	27 July 85	W of Smiley	513-1093	FdDd	Dir 15 Sep 85	513-1093	0	0	8 N of Flaxcombe
31.	987-45363	20 July 86	Smiley	513-1092	Hiwy	Dir 12 Sep 86	513-1092	0	0	near Smiley
32.	987-28588	25 July 81	Wartime	511-1081	Car	4y 15 Jun 86	505-1080	39	163	Kyle
33.	987-46672	26 July 86	N of Maple Creek	500-1092	Hiwy	Dir 24 Aug 86	500-1092	0	0	12 mi N of Maple Creek
34.	987-46002	21 July 85	Smiley	513-1092	FdDd	2y 6 July 87	510-1091	57	168	13S, 5W of Glidden
35.	987-85025	15 July 87	Asquith	520-1071	Hiwy	Dir 11 Aug 87	520-1071	0	0	1 mi E of Asquith
36.	987-85083	22 July 87	Smiley	513-1092	FdDd	Dir 4 Aug 87	513-1092	0	0	5 mi S of Smiley
37.	727-04432	13 July 80	N of Netherhill	513-1085	Car	8y 31 Aug 88	514-1090	22	328	near Coleville
38.	987-42016	23 July 83	N of Netherhill	513-1085	Elct	5y 6 May 89	513-1084	12	90	11N, 2E of Netherhill
Recovered in United States:										
1.	44-612304	6 July 46	W of Yorkton	511-1023	Shot	Dir 10 Nov 46	322-0870	2449	143	Selma, Alabama
2.	48-712234	10 July 53	Bredenburg	505-1020	Trap	Dir Oct 53	442-0911	1087	128	Whitehall, Wisconsin
3.	547-24240	31 July 55	Bethune	504-1051	Shot	1y 11 Aug 56*	453-1033	588	167	Ree Heights, South Dakota
4.	547-24237	31 July 55	Dilke	505-1051	Shot	Ind 10 May 56	431-0975	1018	144	Tripp, South Dakota
5.	787-85457	19 July 70	Saskatoon	520-1063	Shot	2y 3 May 73	363-0971	1875	153	10 mi S of Ponca City, OK
6.	987-25040	25 July 76	Smiley	513-1092	FdDd	3y 8 Dec 79	340-1014	2044	159	Hale Center, Texas
7.	987-28035	17 July 77	Wartime	511-1081	Hiwy	2y May 80	315-0995	2258	159	5 mi W of Winters, Texas
8.	987-27500	14 July 79	N of Kindersley	513-1090	FdDd	Ind Jun 80	443-0965	1192	126	5 N of Estelline, South Dakota
9.	987-28572	12 July 81	E of Flaxcombe	512-1092	Injd	Dir 14 Nov 81	343-1024	1949	162	4 mi SW of Friona, Texas
10.	987-28547	12 July 81	W of Smiley	513-1093	Hiwy	2y 29 Apr 84	363-1004	1810	153	Balko, Oklahoma

NOTES:
 Column 6: "how killed," Hand= caught by hand. Injd = Injured. FdDd = Found dead. Elct = Electrocuted. Hiwy = Highway. Recp = Recaptured on nest, and released by Josef Schmutz. Sght = resighted by Josef Schmutz
 Column 7: birthdate of 1 July is assumed. Dir = direct (till 31 Dec of 1st year) Ind = indirect, 1 Jan to 30 June of next year, aged 7 to 12 months
 Column 8: Asterisk* = inexact recovery date = letter of this date, not necessarily date hawk was found
 Column 9: latilong 513-1054 is between 51° 30' N and 51° 40' N and between 103° 40' W and 103° 50' West, a block at this latitude is roughly 7 by 11 miles.
 Column 10: Measurements by computer program from center of latilong where banded to center of latilong where found. Hence errors in short distances.
 Column 11: 0° is North, 90° is East, 180° is South, 270° is West

Table 2. Central and South American Recoveries of Houston-banded Swainson's Hawks

Band #	Banding Data		Recovery Data				Distance		Locality Where Found	
	Date	Locality	Latilong	How Killed	Date	Latilong	km	degr		
El Salvador:										
1. 617-21641	1 Aug 71	S of Nokomis	512-1050	Shot	Dir 14 Nov 71	140-0894	4378	156	El Jicaral	
2. 987-42025	23 July 83	N of Kindersley	513-1090	Misc	Dir 22 Nov 83	131-0875	4672	148	El Cipres	
Panama:										
1. 987-28027	17 July 77	18 mi S Alsask	510-1095	Hand	1y Oct 78	082-0802	5467	140	Nata	
Colombia:										
1. 787-85401	19 July 69	Simpson	512-1052	Shot	8y 28 Oct 77	043-0755	5887	142	16 mi S of Cartago	
2. 987-28067	15 July 78	W of Biggar	520-1080	Shot	3y 10 July 81*	042-0751	6109	139	Tolima Ibague	
Uruguay: (1st coordinates are south in column 5)										
1. 847-90101	14 July 68	E of Saskatoon	520-1062	FdDd	4y 30 Nov 72	324-0573	10556	140	Young	
Argentina: (1st coordinates are south in column 5)										
1. 787-85464	19 July 70	S of Young	513-1054	Shot	Ind 5 May 71	312-0614	10175	144	16 km S of Rafaela	
2. 787-85406	19 July 69	S of Venn	512-1051	Shot	2y 29 Feb 72	324-0620	10260	145	Marcos Juarez	
3. 617-22125	21 July 73	Smiley	513-1092	Shot	Dir 23 Nov 73	332-0612	10543	141	Firmat	
4. 617-22050	19 July 72	N of Rosetown	514-1075	Shot	1y 12 Jan 74	382-0601	11036	144	Tres Arroyos	
5. 727-04619	13 July 74	Eatonia	511-1092	Dis	1y 4 Mar 76	324-0620	10419	142	3 mi SW of Marcos Juarez	
6. 617-22128	21 July 73	Smiley	513-1092	FdDd	4y 5 Jan 78	373-0584	11066	141	Napaleofu	
7. 617-21690	16 July 72	Smiley	513-1092	FdDd	5y 6 Jan 78	333-0635	10453	143	5 mi NE of Adelia Maria	
8. 637-97348	13 July 67	E of Saskatoon	520-1062	Hand	11y 18 Dec 78	340-0632	10449	145	Laboulaye	
9. 987-28598	25 July 81	N of Kindersley	513-1090	Shot	Ind 5 Jan 82	265-0550	10189	134	Ruiz de Montoya	
10. 617-22171	13 July 74	N of Kindersley	513-1090	Injd	10y 18 May 85	320-0615	10375	141	10 mi S of San Jorge	
11. 987-27413	15 July 78	Smiley	513-1092	Hand	7y 23 Nov 85	324-0612	10477	141	Canada de Gomez	
12. 987-86901	28 July 87	W of Forgan	511-1075	Injd	Dir 17 Nov 87	312-0641	10131	144	Cordoba	
13. 987-46092	19 July 86	N of Kindersley	513-1090	FdDd	2y 10 Nov 88	380-0600	11044	143	Gonzales Chaves	
14. 987-24669	20 July 85	N of Kindersley	513-1090	FdDd	3y Dec 88	383-0534	11369	139	Loberia	

NOTES (for further details, see notes for Table 1):

Column 6: "how killed," Hand = caught by hand. Injd = Injured. FdDd = Found dead

Column 7: birthdate of 1 July is assumed. Dir = direct (till 31 Dec of 1st year), aged 1 to 6 months Ind = indirect, 1 Jan to 30 June of next year, aged 7 to 12 months

Column 8: Asterisk* = with inexact recovery date = letter of that date, not necessarily date hawk found.

Column 9: latilong 512-1050 is between 51° 20' North and 51° 30' N but in Argentina and Uruguay it's South and between 105° 00' West and 105° 10' West

Column 10: Measurements by computer program from center of latilong where banded to center of latilong where found.

Column 11: 0° is North, 90° is East, 180° is South, 270° is West

recovery was shot well to the east, at Selma, Alabama—the first Swainson's Hawk ever recorded in that state, adding one species to Thomas Imhof's *Alabama Birds* (1962). Few bird watchers have added a new species to a state list without ever visiting the state! It may be that this individual was one of the forerunners of a small group of Swainson's Hawks that were first noted as regular winter visitors to Florida in 1950 (Brown and Amadon 1968).

Individuals moving south, usually using north winds to assist them, have been found injured on November 14 at Friona, Texas; dead on December 8 at Hale Center, Texas; shot on November 14 at El Jicaral, El Salvador; dead on a highway on November 22 at Las Flores, La Unión, El Salvador; caught by hand in October in Distrito Natá, Panama; shot on October 28 at Cartago, Colombia. The latter individual was more than eight years of age.

The earliest arrival dates I have from

Argentina are of a two-year-old hawk found dead on November 10 at Gonzáles Chaves and a four-month-old hawk found injured at Córdoba on November 17, 1987, followed by a four-month-old bird shot at Firmat and a seven-year-old bird caught by hand at Carriña de Gómez, both in Santa Fe province, and both on November 23 (Table 2). In adjacent Uruguay, one was found dead near Young on November 30. A three-year-old bird was found dead sometime in December at Loberia. On December 18, 1978, one was caught near Laboulaye, Córdoba; for a year it held the record for the oldest Swainson's Hawk—11 years, five months of age when it died. Then another hawk was found freshly dead near its natal site in southwestern Saskatchewan 15 years and nine months after banding (Houston and Millar 1981). My second oldest Swainson's Hawk was found injured in mid-May south of San Jorge, Santa Fe province, more than 10 years after

banding.

My other seven Argentina recoveries, all after January, included one at Ruiz de Montoya in Misiones province in the north; one at Susana in Santa Fe province; two at Marcos Juárez and one at Adelia María in Córdoba province, and the farthest south birds at Tres Arroyos and Napaleofu in Buenos Aires province (Figure 1).

On the return northward journey, a three-year-old was shot at Tolima Ibague, Colombia, but the date is not known. A two-year-old was shot on May 3 at Ponca City, Oklahoma, and another was struck by a vehicle on May 2 at Nokomis, Saskatchewan.

Records of individual birds, as mapped in Figure 1, are impressive in themselves. All travel in a constant compass direction about 40 degrees east of south, and due to undulating contours of land, will have travelled even farther than the direct distance of up to 7,000 miles (Table 1). The 11-year-old bird will have made 11 trips

Figure 1—Map of Saskatchewan-banded Swainson's Hawks recovered in Central and South America. Squares = same calendar year as banded. Circles = subsequent years.



of this distance to Argentina and ten journeys back north, or close to 150,000 miles, a distance equal to that achieved during the "life" of the average motor car!

This migration raises fundamental questions about the bioenergetics involved. For fifty years we have known that Swainson's Hawks, as they continue south, switch to thermal soaring as an energy-conserving technique, continuing to fly over land and to the best of our knowledge never over ocean. Helmuth Otto Wagner (1941) observed the "upwards spiral soaring repeated over successive ridges," following a relatively narrow flight path at 1000 meters elevation near Huixtla in the province of Chiapas in extreme southern Mexico. Dickey and Van Rossem (1938) described similar flights over Central America.

Recently, Neal Smith's elegant studies in Panama have added much valu-

able knowledge (Smith 1985a, 1985b, 1985c, 1985d). Since it is not possible to make accurate estimates with the naked eye, Smith has used two motor-driven 35mm cameras, beginning with an 85mm lens and eventually using a 1000mm lens as flocks of up to 35,000 hawks rise almost out of sight on the thermal air currents. In the 1972 fall migration, 344,409 Swainson's Hawks passed over Ancon Hill near Panama City. These hawks, without any food supply for weeks at a time, live off their fat reserves; lack of any feces or pellets beneath their night roosts confirms that they are fasting (Smith, Goldstein and Bartholomew 1986).

When the major flocks of Swainson's Hawks arrive in Argentina, they are often so tired, thin, hungry, and weak, that some can be caught by hand. Such individuals are literally starving. They then have about four months to fatten up on the pampas, eating mainly locusts. Table 3 shows that experienced adult birds are disproportionately represented in Uruguay and Argentina.

In 1988 and 1989, I placed anodized, double-rivet green bands on 200 Swainson's Hawk nestlings near Kindersley, Saskatchewan. Each color band has two letters or numbers, one above the other, repeated four times around the band, and so visible from any angle. These are easily read if the hawk perches on a fencepost near a highway. There is also a regular aluminum band on the other leg. Other Swainson's Hawks have similarly received blue or red plastic bands, applied near Hanna, Alberta, by Josef Schmutz. Birders are requested to watch all migrating Swainson's Hawks for the presence of color bands.

We hope the color bands will help solve the mystery of where the year-

old, nonbreeding Swainson's Hawks spend the boreal summer, and increase the number of age-class records. Not one of my color bands has been sighted in Saskatchewan or Alberta during the year after banding, and there has not yet been a recovery of a one-year bird in either province (Table 3). Recoveries of breeding adults have been recorded in Saskatchewan from ages 2 through 8, at distances of 7, 15, 25, 39, 46, and 86 miles from their natal site. Dispersal may be even greater than this, for Josef Schmutz has trapped three of my nestlings on their nests in his study area in Alberta, 117, 122 and 193 miles, respectively, from their natal site.

We don't fully understand why Swainson's Hawks each year make a 14,000 mile round trip from the grasslands of Saskatchewan, to similar habitat in Argentina, and back again. Among North American raptors, only the tundra subspecies of the Peregrine Falcon, *Falco peregrinus tundrius*, which may travel from the Arctic shores to the tip of Patagonia, exceeds this distance. Is this barely possible round trip really necessary? Is it worth four months or more of travel every year?

"Those raptors which migrate the farthest are those which, from a north temperate view, have the most peculiar diets" (Smith 1980). On what we northerners call their "wintering grounds" (for of course it is then summer in Argentina), Swainson's Hawk feeds mainly on insects, Broad-winged Hawks on reptiles and amphibians, Turkey Vultures on carrion, and Ospreys on fish. Such food habits, and the movements necessary to sustain them, must have evolved over many hundreds or thousands of years. Do Swainson's Hawks carry on to South

Table 3. Saskatchewan-banded Swainson's Hawks where and when recovered (all banded by C.S. Houston)

	Age (Months)		Age (Years)		(Each year ends 30 June)								% Recoveries		
	0-6	7-12	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10	11	Total	1st 6 mos
Sask-Alta	29	0	0	4	3	2	3	2	1+	1	0	1+	0	44	65.9%
U.S.A.	3	2	1	3	1	0	0	0	0	0	0	0	0	10	30.0%
El Salvador to Colombia	2	0	1	0	1	0	0	0	0	1	0	0	0	5	40.0%
Argentina & Uruguay	2	2	2	2	1	2	1	0	1	0	0	1	1	15	13.3%
Total	36	4	4	9	6	4	4	2	1	2	0	1	1	74	48.6%
									1+1			1+1			

NOTE: Asterisk* represents a hawk with an inexact recovery date, not fully reliable for life table use. We know only the date of the letter reporting the band, NOT the date the band was found.

+ refers to Saskatchewan-banded hawks, retrapped in Alberta at 5 and 7 years and 6 and 10 years respectively, making 76 encounters of 74 individual birds.



Annual records of the birds are impressive: all travel in constant compass direction about 40 degrees east of south, and due to undulating contours of land, will have travelled even farther than the direct distance of up to 7,000 miles. The 11-year-old bird will have made 11 trips of this distance to Argentina, or close to 150,000 miles, a distance equal to that achieved during the "life" of the average car! Left photograph/B.K. Wheeler/VIREO (W1311/027); right photograph/B.K. Wheeler/VIREO (W1311/022).

America because their logical wintering area, Texas and northern Mexico, is already heavily populated or saturated in winter by larger buteos, the Ferruginous, Red-tailed and Rough-legged hawks? Is there insufficient or inappropriate food for them in Texas and Mexico?

Whatever the answers, Swainson's Hawks offer us not only a topic for investigation, but a great spectacle. As Brown and Amadon (1968) put it, their southward migration offers what "may be the most impressive avian gatherings in North America, since the demise of the Passenger Pigeon." ■

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