

A SUBSTANTIAL HAWK MIGRATION IN NORTHWEST FLORIDA

Robert and Lucy Duncan

Buteos in large numbers are often seen in Gulf Breeze (Santa Rosa Co.), Florida, after cold frontal passage in September and October. That Broad-winged Hawks (*Buteo platyterus*) migrate along regular flyways (Forbush and May 1955) and are coastal migrants reluctant to cross large bodies of water (Bent 1961) is well documented.

Gulf Breeze is located at the end of a peninsula 20 miles long and $\frac{1}{2}$ to 3 miles wide, bounded by Pensacola Bay on the north and west and Santa Rosa Sound on the south. It is heavily wooded with Scrub Pine (*Pinus clausa*) and Live Oaks (*Quercus virginiana*). The authors reside near the end of this peninsula and have kept records of birds there for several years. Migrating hawks en route to their winter quarters in Central and South America arrive from the east, singly or in small groups, and accumulate in late morning, forming "kettles" in thermals and sometimes descending to treetop level. Broad-winged Hawks constitute over 90% of the buteos, and the ratio of adults to immatures is about 1:5. Accipiters, falcons, and kites form part of the movement but in smaller numbers.

The senior author has recorded daily weather data since 1963. Frequent observations of hawks were made with 7X binoculars from 0830 until early afternoon during September and October. Because newly arriving buteos join those present, only the maximum number seen at any one time were recorded. A summary of hawk totals for 1972-74 appears in Table 1. The high total for 1974 may be a result of more frequent observations during critical weeks.

Hawk migration at Gulf Breeze was observed by Francis M. Weston (1965: 6, 40-41) as early as 1943. A significant change in relative and absolute numbers of Broad-winged and Red-shouldered Hawks has occurred in recent years. Table 1 indicates that Broad-winged Hawks constituted 77-94% of the total hawk flight, whereas prior to 1965 Weston noted that Red-shouldered Hawks were the most abundant hawks. The maximum number of Broad-winged Hawks counted by Weston was 77 on 7 September 1953 whereas flocks in excess of 100 are now noted (Table 2). Flocks in excess of 100 Red-shouldered Hawks were reported on 4 occasions by Weston, whereas the maximum number for the 3 years listed in Table 1 was 15 in 1972.

Weston (1965: 40-41) observed that hawks arrived in small numbers from the east, peaked in the forenoon, and would "break and cross the Bay in a straggling line." On 23 September 1974 members of the Francis M. Weston Audubon Society established lookout stations in an attempt to establish immediate origin and destination of the hawks. Observers 5 miles to the east reported single Broad-winged Hawks flying westward down the middle of the peninsula (Charles Broughton and Goldwyn Gary, pers. comm.). A party at Ft. Pickens on Santa Rosa Island, a sand barrier island 5 miles to the SW, had no sightings (C. W. Milmore, pers. comm.), nor did a party at Naval Air Station, Pensacola, 5 miles west (Mary Lou Mattis, pers. comm.). Yet 212 were present over Gulf Breeze at 1100 CDT and left at a high altitude in a westerly direction (Lucy Duncan). It is reasonable to assume that they continue westward in their coastal migration and form part of the great numbers of hawks observed from Texas to Panama at this time of year (Smith 1973; Webster 1972).

Large flocks of hawks are observed elsewhere along the northern Gulf Coast in fall along peninsulas, but in Gulf Breeze the migration is apparently distinctive in its relation to specific weather conditions and in its predictability. First arrivals appear 24 to 48 hours after frontal passage and not until the wind has settled in the northeast quadrant. West and northwest winds do not bring hawks. They continue to pass through in diminishing numbers for as many as 3 days after frontal passage, provided the wind remains in the northeast quadrant. Once the wind has diminished or changed direction, hawk sightings end. Fronts arriving in northwest Florida and the Atlantic Coast-Appalachian Slope are approximately coincidental at this season. Although they approach northwest Florida from the north and west, windshift is usually to the north or northeast within a few hours after passage. Table 2 is a summary of weather data and hawk counts. Since Broad-winged Hawks arrive soon after frontal passage and travel in a westerly direction, it appears that they are originating out of the northeast within a day or two of Gulf Breeze, because the front has not moved far enough east by the time of their arrival to allow a more northerly point of origin. This would assume a point of origin 200 to 400 miles from Gulf Breeze, allowing an average migrating speed of 25 m.p.h. (Lincoln 1950), and 8 hours' travel a day. This suggests they may be part of a southern population from breeding areas in eastern Alabama and western Georgia stimulated into migration by the advancing front, cooler, drier air masses, and favorable flying conditions. Henry M. Stevenson (pers. comm.) suggests they may migrate to the coast via such river valleys as the Apalachicola.

Yet other flocks observed at peninsula locales do not indicate a weather correlation. On 10 October 1974 Gary and Mattis (pers. comm.) observed 3 groups totalling 60 Broad-winged Hawks between 1000 and 1200 CDT at Ft. Morgan, Ala., about 60 miles west of Gulf Breeze. On 12 October 1974 over 100 buteos were seen circling in mid-morning over the St. Joseph Peninsula, Gulf County (Steve Stedman, pers. comm.) and about 30 at that same time and date at Hickory Mound Impoundment, Taylor County, by the authors. None of these sightings were related to recent frontal passage and the hawks seen on 12 October were on light southerly winds. Interestingly, no large flock of hawks was seen at Gulf Breeze after 3 October 1974 in spite of their presence along the coast both east and west. Thus Gulf Breeze may be unique in Florida in affording observers the opportunity to observe hawks in numbers with some degree of predictability during fall migration.

We would like to thank the members of the Francis M. Weston Audubon Society who assisted in making observations and Hal and Brooke Beecher for their helpful suggestions on the manuscript.

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TABLE 1
Summary of Hawk Totals for 1972, 1973, 1974

		1972		1973		1974	
		no.	%	no.	%	no.	%
Mississippi Kite	(<u>Ictinia mississippiensis</u>)	6	3%	11	2%	18	2%
Sharp-shinned Hawk	(<u>Accipiter striatus</u>)	11	5%	17	4%	11	1%
Cooper's Hawk	(<u>Accipiter cooperii</u>)	3	1%	9	2%	7	1%
Red-tailed Hawk	(<u>Buteo jamaicensis</u>)	3	1%	3	1%	0	0%
Red-shouldered Hawk	(<u>Buteo lineatus</u>)	15	7%	1	0-1%	2	0-1%
Broad-winged Hawk	(<u>Buteo platypterus</u>)	163	77%	400	89%	772	94%
Merlin	(<u>Falco columbarius</u>)	3	1%	4	1%	4	1%
American Kestrel	(<u>Falco sparverius</u>)	7	4%	6	1%	7	1%

TABLE 2
Weather and Broad-winged Hawk Data for 1972, 1973, and 1974

Year	Frontal Passage	Front Intensity	Wind Direction & Velocity (mph)	Dates of Arrival & Numbers of Hawks	
1972	September 30	Strong	NW 15-22	...	0
			NE 10-15	October 1	10
			NE 10-15	October 2	2
	October 7	Moderate	N 12-18	...	0
			NE 5-15	October 8	135
1973	September 18	Moderate	N 10-13	...	0
			N 5-12	September 19	300
			Var. 0-10	September 20	7
	October 17	Moderate	NE 10-20	...	0
			NE 10-18	October 18	40
			NE 5-15	October 19	8
			NE 5-12	October 20	8
1974	September 15	Weak	N 5-13	...	0
			NE 4-8	September 16	20
	September 21	Strong	N 13-20	...	0
			N 13-22	September 22	19
			NE 12-22	September 23	212
	September 29	Strong	N 15-20	...	0
			N 13-23	September 30	8
			NE 12-18	October 1	325
			NE 15-25	October 2	50
			NE 12-28	October 3	125