

Articles

Twenty-two Years of Ruby-throated Hummingbird Migration at Holiday Beach Conservation Area, Ontario

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Introduction

This paper presents both data and observations regarding the migrations of the Ruby-throated Hummingbird (*Archilochus colubris*) at Holiday Beach Conservation Area, Essex County, Ontario, in order to provide an understanding of their movements in the region. Data were obtained from many dedicated individuals, whose participation was requested in addition to their duties as hawk counters. The data span twenty-two years, from 1976 to 1997. Ellie Cox provided the data from 1976, and from 1977 through 1982, the author was the sole source of data. From 1982 to the end of the season in early October 1997, observers from the Holiday Beach Migration Observatory, and others, were largely responsible for the daily tallies, which have been compiled by the author. Data associated with specific hours and weather conditions prior to 1990 are entirely the author's. Data from more than 9,000 birds are included in this study.

Study Site and Methods

Holiday Beach Conservation Area

is located in extreme southwest Essex County in extreme southwestern Ontario (see Figure 1), about 5 km south-southeast of Amherstburg. The northern edge of the park is bounded by Essex County Road 50, the west edge by the eastern side of the mouth of Big Creek, the east edge by farmland and the south edge by Lake Erie. Habitats present include lakeshore, freshwater marsh, open deciduous woodland (mainly maple and cottonwood) and open areas (parking lots). There are some pines and cedars near the northern end of the park.

This area has long been known as a hawk migration site and the data contained in this study were obtained in addition to the hawk count by volunteer observers. Data concerning weather were gathered from that taken for the hawk count. In order to maximize the view of the sky, the main site for counting is a parking area at the southwestern corner of the park. Hummingbirds were counted, hour by hour, as they flew past the ground-based observer(s) from 1976–1988. In 1989, a

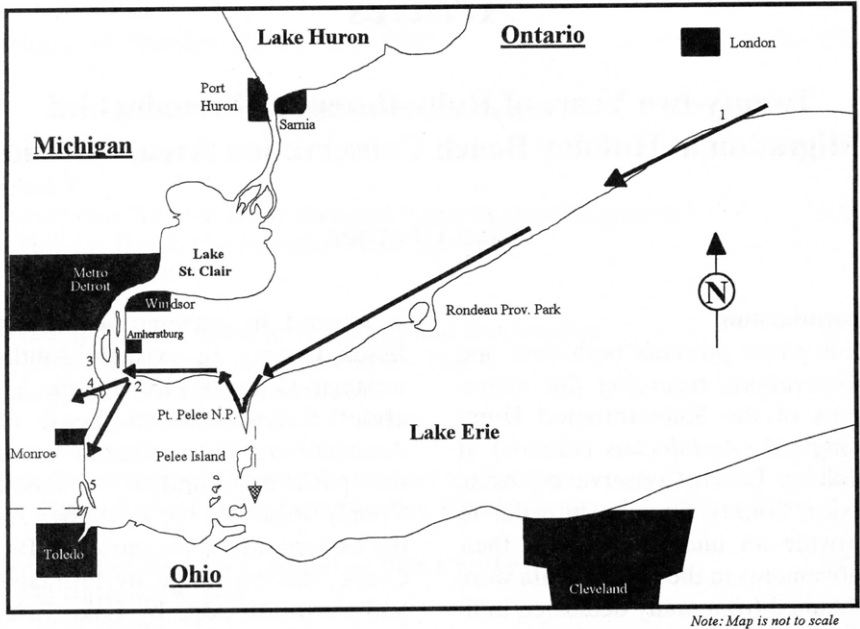


Figure 1: Holiday Beach location (2) and some hummingbird migration routes through the area.

new observation tower (13 m high) was erected at the site, and observations were made from it through 1997. Care must be taken to distinguish the rapid and difficult-to-detect hummingbirds from the migrating dragonflies and large bees also flying through. All observers were experienced enough to make this distinction. Coverage was most consistent from 1983–1997 (Figure 2).

Annual Cycles of Migration

After an initial low period from 1976–1979, when there was also low observer effort, the annual totals

appear to be cyclical. Figure 3 shows an approximate two year cycle of high and low numbers between 1981 and 1988. From 1988 to 1991, the cycle appears to have leveled off, but this could be due to the effects of observers adjusting to counting from the new hawk tower at 13 m above the ground.

Seasonal Migration Pattern

Ruby-throated Hummingbirds have been detected at Holiday Beach from 18 August to 11 October. Evidence from other sites indicates that adult males can begin migration as early as late July, but efforts

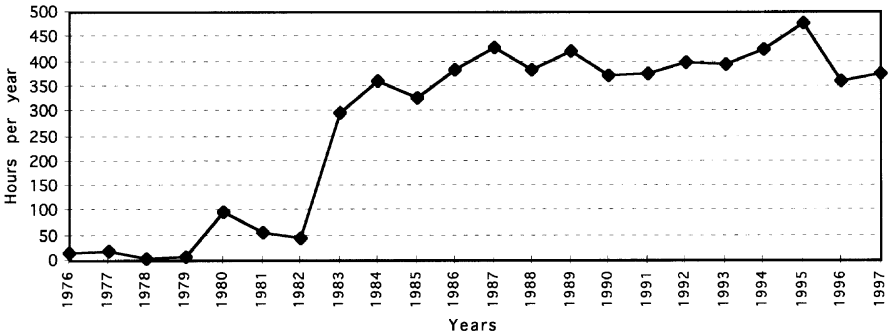


Figure 2: Annual observer effort between 15 August and 12 October (1976–1997).

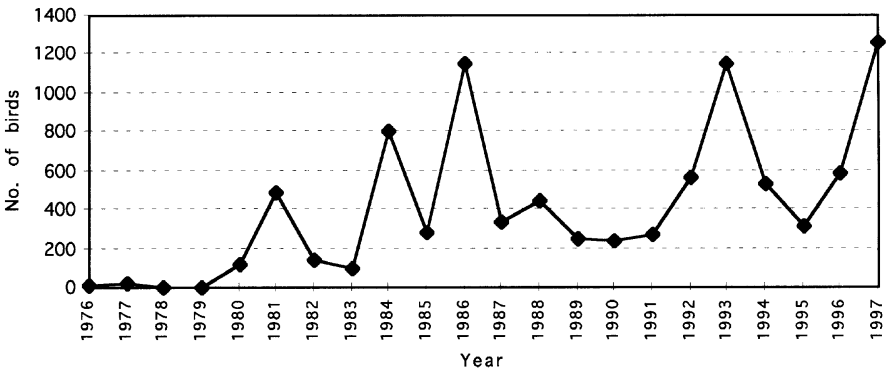


Figure 3: Annual Ruby-throated Hummingbird totals at Holiday Beach (1976–1997).

to locate adult males, or migration earlier in August, have thus far been unsuccessful. Since the birds rarely are observed hovering or feeding, there is little likelihood that any data regarding differential migrations based on age or sex classes will be possible without conducting

banding studies at the site. It is possible, given a good view, to distinguish an adult male in flight as it passes the observer, but to date there have been very few reports. The male birds may take different routes. Incidental catches of hummingbirds at nearby Metrobeach

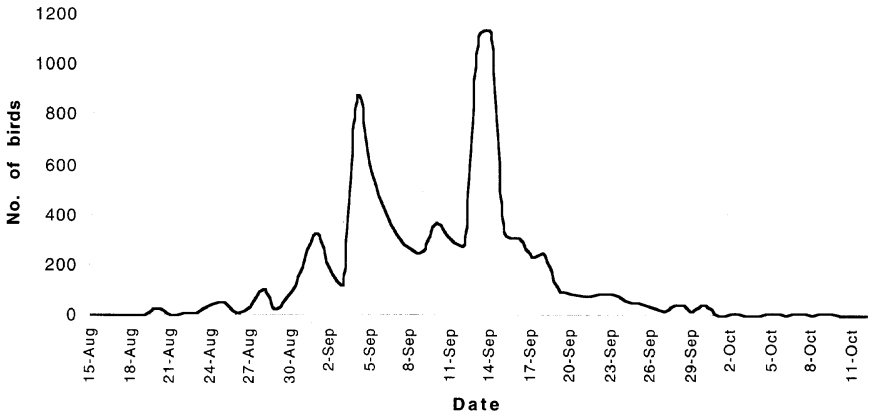


Figure 4: Daily abundance of migrating Ruby-throated Hummingbirds at Holiday Beach (composite of all data from 1976–1997).

Metropark, Macomb County, Michigan (pers. obs.) imply a pattern of adult females followed by immature males, followed by immature females. The pattern of seasonal occurrence shown in Figure 4 hints at a possible dual peak of numbers, one around 5 September and another around 15 September. These peaks may coincide with the adult females and immatures of both sexes, respectively, although this is only speculation in the absence of banding studies. Very few adult males have ever been identified during the migration study at Holiday Beach. It is interesting that there have been hummingbirds through to October annually since 1984 (total of 54 birds, 0.59% of the total). The data from Hawk Mountain, Pennsyl-

vania (Willimont et al. 1988) do not show any migration into October.

Daily Migration Pattern

Data from Hawk Mountain (Willimont et al. 1988) portrayed the daily rhythms of hummingbird migration as limited in the morning, typically not beginning until 1000h (E.S.T.) and finishing before 1400h. This was attributed to the birds' apparent need to warm up in the morning before commencing migration. The data from Holiday Beach (with an average of five times as many birds per season as Hawk Mountain) show a much wider range of migration time (Figure 5). The earliest birds were through between 0500h and 0600h, and the latest were through between 1700h and 1800h. In fact,

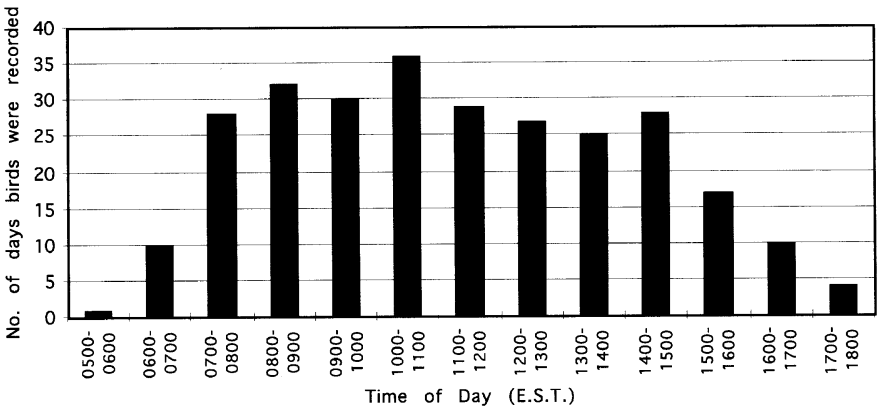


Figure 5: Hours of Ruby-throated Hummingbird migration at Holiday Beach (data collected principally by the author from 1983–1990).

as shown in Figure 6, 38% of all hummingbirds at Holiday Beach migrated *before* 1000h! The difference in the two sets of data may be attributable to the higher altitude of the Hawk Mountain site, as Holiday Beach is at roughly 195 m (650 feet) above sea level, and is in an extremely flat area of southwestern Ontario. Conditions on Hawk Mountain may be colder during the birds' migration period, requiring longer morning "warm-ups". The October records from Holiday Beach are mainly of birds seen in the afternoon.

Migration Pattern Relative to Wind Direction

As at Hawk Mountain, there was a strong correlation between north-west and west winds and peak

migrations of hummingbirds (Figure 7). The large peak for southerly winds in Figure 7 is due to an apparently anomalous single day where 520 birds passed in one afternoon! Factoring this day out, there were only 38 birds that passed on southerly winds.

Food Plants

Once the birds have flown out of the woods and are heading across the parking lot to be counted, there is little to distract them. Artificial red flowers placed on the tower in 1990 only caused about 5% of the birds to pause. Natural food items were present in the medians between parking lanes (through 1996, when many lanes were removed for construction of a pond). Only about 5% of all birds

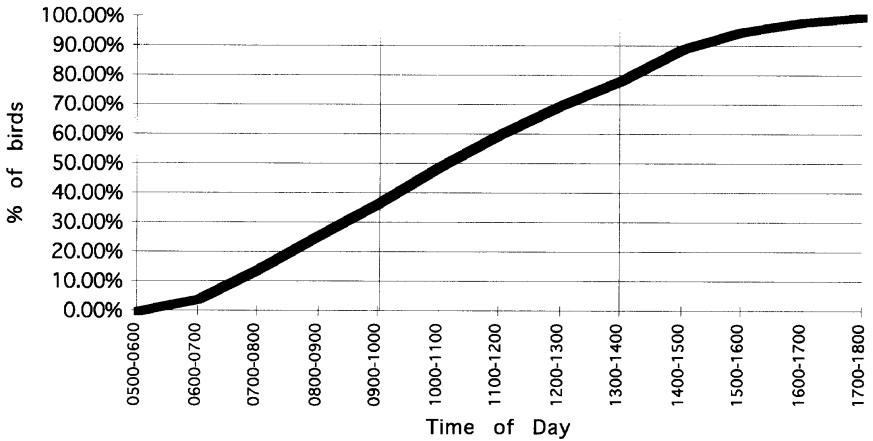


Figure 6: Percent of Ruby-throated Hummingbirds accumulated by hour (same data as Figure 5).

(estimate) have ever been observed to pause in these areas. The plants fed upon at these times include (in order of occurrence) Purple Loosestrife (*Lythrum salicaria*), Small White Aster (*Aster lateriflorus*), and Turtlehead (*Chelone glabra*) once. On the edge of the open woodland are stands of Spotted Jewelweed (*Impatiens capensis*), where birds have been seen occasionally feeding prior to striking out across the open areas.

Flight Style

Laboratory studies of the bioenergetics of flying hummingbirds made to determine their ability to cross the 800 km (500 mile) wide Gulf of Mexico have, necessarily, concentrated on hovering birds enclosed in

bell jars (Odum et al. 1961, Lasiewski 1962). The actual flying style of migrating birds is quite different, and may extend significantly their flying range (pers. obs.). Birds have been observed consistently to flap vigorously for about 1 second or more, followed by a period of "free fall", where the wings are either folded or not flapped, for about 0.5 seconds or more. This gives the birds a somewhat bounding flight style, and the technique is used at all altitudes thus far observed. This technique is known to conserve energy in woodpeckers and other species (Tobalske 1996), but apparently has not been described previously for the Ruby-throated Hummingbird.

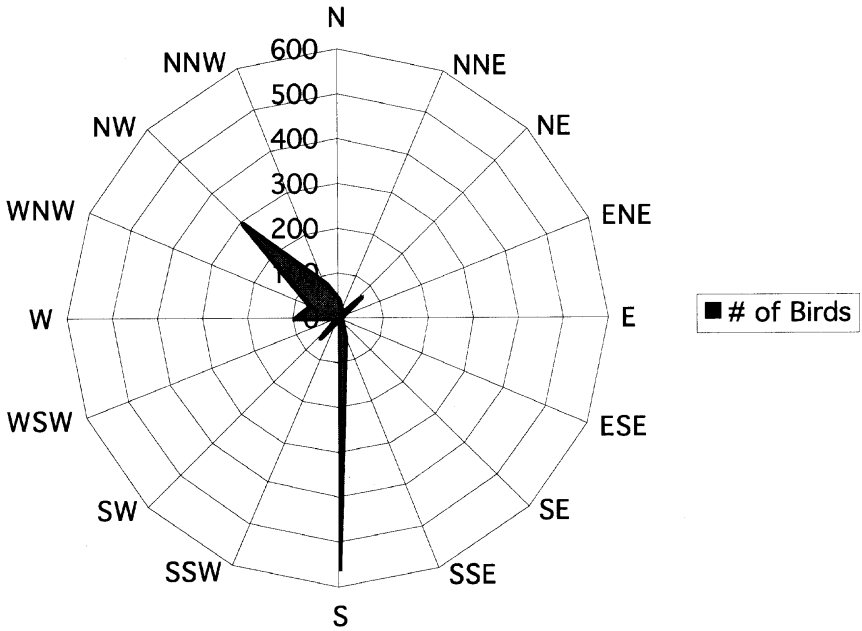


Figure 7: Number of birds by wind direction (same data as Figures 5 and 6).

Flight Speed

Published flight speeds of the Ruby-throated Hummingbird have ranged from 40 to 80 km/h. On 8 September 1980, I measured two distances on frequently used flight lanes. One was 15 m and was

between the vegetated medians between parking lanes. The other was 21 m. A stopwatch was used to time the birds as they flew between these measured lanes. The birds were able to be detected momentarily before reaching the starting

Distance (m)	Time (secs.)	Speed (km/h)	Wind
15	1.0	54	crosswind 8 km/h
15	1.0	54	crosswind 16 km/h
15	1.4	38	against 5 km/h
15	2.1	26	against 8 km/h
21	1.2	63	crosswind 8 km/h

Table 1: Flight speeds of Ruby-throated Hummingbirds at Holiday Beach.

point. Times were obtained ranging from 26 km/h against an 8 km/h headwind to 63 km/h with an 8 km/h crosswind. Data from the five timed flights are shown in Table 1.

Altitude of Flight

Altitude of flight data were collected only for 1990 from the volunteer hawk counters that year. Observations were made from the top of the tower (13 m high). Birds are rarely, if ever, observable below eye level from here. They blend in with the vegetation, and their size and direct flight make them extremely difficult to detect under these circumstances. About 90% of all birds noted in 1990 were from 2–5 m overhead, or 15–18 m above the ground. About 4% were over 5 m overhead, up to a maximum of about 30 m, which may be as far as hummingbirds in flight can normally be detected. Rare individuals (~1%) were picked up in binoculars and could have been 50 m or more overhead. These data could be misleading, as they may represent observer location more than true altitude of flight. Data from ground-based counts prior to 1990, although lacking, can be estimated based on my 22 years of experience. About 80% came through from eye level to 10 m overhead, 18% came through from 10 to 30 m overhead, and 2% were detected only in binoculars at 30 m or more overhead.

Migration Routes

All hummingbirds that were observed migrating past the site were flying from east to west, parallel to, and about 20–300 m north of the shore of Lake Erie (Figure 1). It is interesting to note that the birds seemed to be exhibiting the same “water avoidance” behaviour as the hawks during their migration. One observer (Michael Kielb) has commented that this pattern, combined with the scarcity of Ruby-throated Hummingbirds in the Yucatan Peninsula of Mexico (des Montes 1988, Loftin 1991, pers. obs.), suggests that far fewer birds may actually *attempt* the crossing of the Gulf of Mexico than is currently assumed. Studies to date have concentrated on the bioenergetics pertaining to whether Ruby-throated Hummingbirds *could* make the crossing (Odum et al. 1961, Lasiewski 1962). Another observer (Alan Wormington) has noted numbers of Ruby-throated Hummingbirds leaving the southern tip of Point Pelee (east of Holiday Beach, see Figure 1) in the fall, so birds do cross the lake. The maximum water crossing from this point to Pelee Island is about 14 km, where they can then hop another 15 km to Kelley’s Island (where birds have been noted in mid-August; pers. obs.), then on the final 15 km to the southern shore of Lake Erie in northern Ohio. Near Holiday Beach, the crossing is more on the order of 60 km, but this is far

short of the 800 km (500 miles) across the Gulf of Mexico! Studies of trans-Gulf migration published in the literature (Van Tyne and Trautman 1945, Williams 1945, Lowery 1946, Williams 1948, Bullis and Lincoln 1952, Williams 1952, Paynter 1953, Bullis 1954, Siebenaler 1954, Stevenson 1957) only contain about a dozen sightings of Ruby-throated Hummingbirds. This bird is very numerous in coastal Texas in September and October (Stokes and Stokes 1989, pers. obs.), so the magnitude of Ruby-throated Hummingbird migration crossing the Gulf of Mexico could be a very small proportion of the species' migration as a whole.

Acknowledgements

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