

An early spring influx of Acadian Flycatchers (*Empidonax virescens*) into southern Ontario, April 2014

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Introduction

The Acadian Flycatcher (*Empidonax virescens*) (Figure 1), one of Canada's rarest breeding songbirds, is found almost exclusively in the Carolinian life zone (COSEWIC 2010). While rare in its Canadian range (Martin 2007), it is globally stable and common within the bulk of its range (Whitehead and Taylor 2002, Sauer *et al.* 2014), breeding primarily in the eastern US and wintering in southern Central America (Nicaragua, Costa Rica and Panama) and northwestern South America (Columbia, Ecuador and Venezuela) (Whitehead and Taylor 2002). Within southern Ontario, the Acadian Flycatcher is predominantly found in mature deciduous forests with interspersed Eastern Hemlock (*Tsuga canadensis*) in wooded ravines and swamps (Martin 2007, COSEWIC 2010). In recent years, Bird Studies Canada has

conducted extensive surveys for this species throughout Norfolk and Elgin counties (J. Allair pers. comm.). Largely because of these surveys and the most recent Ontario Breeding Bird Atlas, the Canadian population has been estimated to be between 25 and 75 pairs with additional unmated males (COSEWIC 2010). This population estimate has invariably fluctuated in any given year and the estimate is more precisely in the range of 35 to 50 pairs (COSEWIC 2010, J. Allair pers. comm.). Core strongholds have been identified in the following Important Bird Areas: Port Franks Forested Dunes, Skunk's Misery Complex, Southwest Elgin Forest Complex, Clear Creek, Greater Rondeau Area and Norfolk Forest Complex (COSEWIC 2010, Bird Studies Canada and Nature Canada 2014).

Figure 1. Acadian Flycatcher, (*Empidonax virescens*), 2 May 2014. Point Pelee National Park, Essex County, Ontario. This individual was a new arrival, having been first detected the previous day.

Photo: Brandon R. Holden.



Like many Tyrant Flycatchers in Ontario, Acadian Flycatchers are regarded as late spring migrants, typically arriving in Ontario in mid-May (COSEWIC 2010, eBird 2014a). In recent years (*i.e.* post-2000), extremely early spring Acadian Flycatchers have been noted (along with other unseasonably early Neotropical migrants) with April records occurring in three of the past seven years (including 2014). Older males tend to arrive earlier than females and young birds (Whitehead and Taylor 2002, Kokko *et al.* 2006) with the latest spring migrants recorded as late as 10 June at non-breeding locations (eBird 2014a, R. Ridout pers. comm.).

In April 2014 an unusually high number of early spring Acadian Flycatchers were reported in southern Ontario between 25 and 30 April (eBird 2014a, B. Holden and K. Burrell pers. obs.). The

purpose of this paper is to examine the magnitude of the early influx of this species into Ontario in 2014 and the associated weather patterns.

Methods

Sightings of Acadian Flycatcher in Ontario in April, 1900 to 2014, were gathered from eBird (2014a, 4b), North American Birds (and its predecessors), the ONTbirds listserve and personal communication (see Acknowledgements). April records of Acadian Flycatchers from the continental US in 2014 were also gathered from eBird (2014b). Only records from eBird that were included in the public outputs (*i.e.* which have been vetted by regional editors) were included in these analyses. In analyzing the records from Ontario in April 2014, the authors

undertook an appropriately conservative approach for discerning the number of individuals observed. For example, if two birds were seen in two relatively widely separate areas (at Point Pelee National Park) less than an hour apart, we assumed they were different individuals. eBird records were plotted by five-day period on a map of North America using ArcGIS 10.2 ESRI. Records were also analyzed using Microsoft Excel to compare the latitude of each sighting to the date.

Meteorological events were observed in real time as they unfolded (*i.e.* online) and afterwards from archived information from Environment Canada's Canadian Weather products and the National Oceanic and Atmospheric Administration's National Weather Service (2014a, b, c).

Results

In our analysis, we concluded that a minimum of six different Acadian Flycatchers (out of a total of 12 separate sightings) were observed and reported in Ontario in April 2014, with all but one occurring at Point Pelee National Park (Table 1). This is as many as was recorded previously (pre-2014) in April in all of Ontario, with the earliest being 24 April 1994 (Table 2).

A total of 1,191 eBird records of Acadian Flycatcher from April 2014 in the US was accepted by regional editors as of 15 July 2014. Acadian Flycatcher reports ranged from 4-30 April and covered approximately the southeastern quarter of the US (Figure 2). There was a positive relationship between latitude and date of sightings; at higher latitudes Acadian Flycatchers arrived later in April (Figure 3).

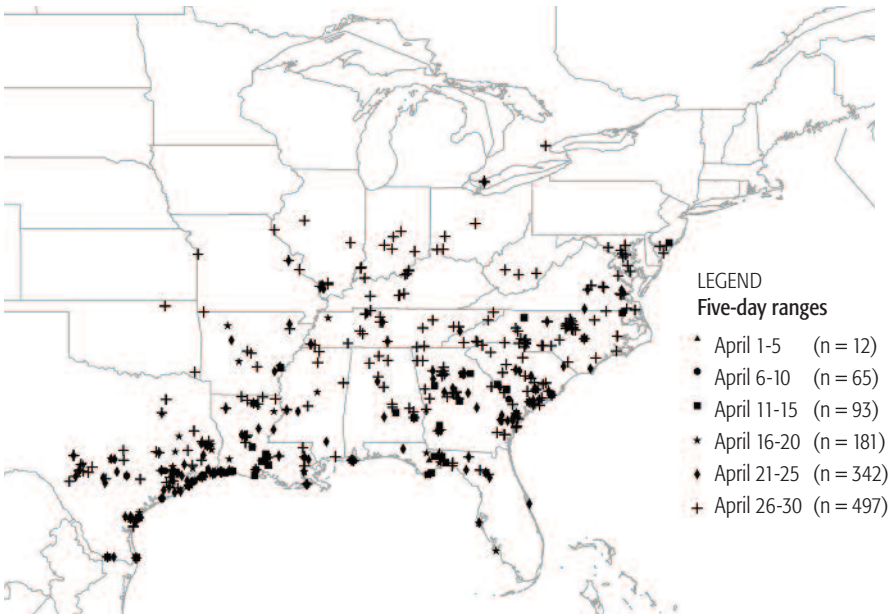


Figure 2. April 2014 Acadian Flycatcher records in the United States and Canada from eBird (2014b) by five-day period.

TABLE 1. Records of Acadian Flycatchers throughout Ontario in April 2014. All records have been vetted and are from eBird (2014a) and ONTbirds. PPNP denotes Point Pelee National Park.

| Date | Location | Finders | Details |
|----------|---|---|---|
| 25 April | PPNP (halfway between the tip and the Visitors Centre on main road), Essex County | Kenneth G.D. Burrell and Brandon R. Holden | 1 bird photographed |
| 26 April | Milton (8th Line and Britannia Road), Regional Municipality of Halton | David I. Pryor | 1 bird photographed This is an exceptionally early individual, particularly considering the location (away from the Great Lakes) |
| 29 April | PPNP (Group Campground), Essex County | Brandon R. Holden and Eric W. Holden | 1 bird observed and photographed |
| 29 April | PPNP (West Beach), Essex County | Brandon R. Holden and Eric W. Holden | 1 bird observed |
| 30 April | PPNP (Tilden's Woods), Essex County | Brandon R. Holden, Eric W. Holden, Lev A. Frid, and Murray A. Shields | 1 bird observed and photographed |
| 30 April | PPNP (Tip area), Essex County | Brandon R. Holden and Eric W. Holden | 1 bird observed |

TABLE 2. April records (pre-2014) of Acadian Flycatchers throughout Ontario. PPNP denotes Point Pelee National Park.

| Date | Location | Observers | Details |
|------------------|--|--|-------------------------------|
| 24 April 1994* | Long Point Provincial Park, Norfolk County | Robert Z Dobos, Kevin McLaughlin, Bill Lamond, George Naylor and Paul Rose | 1 individual observed |
| 26 April 2008 | PPNP (Tilden's Woods), Essex County | Alan Wormington, Robert J. Cermak and J. Michael Tate | 1 individual observed |
| 26-27 April 2011 | Pelee Island (Fish Point), Essex County | Kenneth G.D. Burrell | 1 individual observed singing |
| 27 April 2011 | PPNP (Woodland Nature Trail), Essex County | David G. McNorton | 1 individual observed |
| 29 April 2009 | PPNP (Sparrow Field), Essex County | Brandon R. Holden and Lauren F. Rae | 1 individual observed |
| 30 April 1984 | PPNP (Tilden's Woods), Essex County | Kevin McLaughlin and Paul Pratt | 1 individual observed |

*Earliest spring record for Ontario.

Figure 3. April 2014 eBird (2014b) records of Acadian Flycatcher in the US by date and latitude, rounded to the nearest degree. The solid line indicates the mean date for each degree of latitude. Individual data points may represent more than one record.

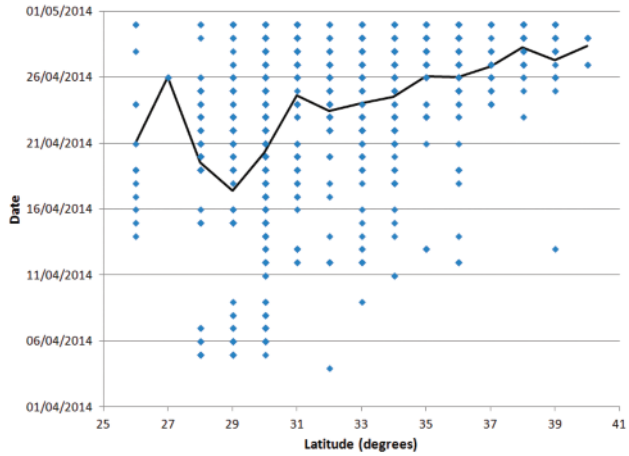
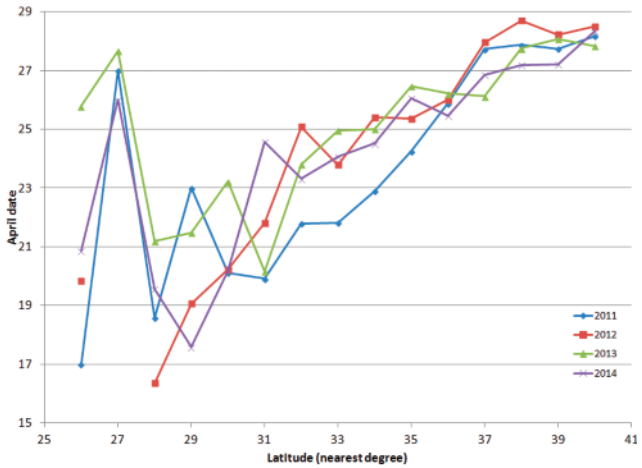


Figure 4: Mean April date by latitude (rounded to nearest degree) for eBird records of Acadian Flycatcher in the US for 2011-2014.



We compared the mean April arrival date by latitude in 2014 with the same information from the previous three years (Figure 4) and found that the overall pattern was similar in each year from 2011-2014.

Weather Analysis: A review of weather patterns during the study period in 2014 yielded two distinct events that may have set the stage for the early arrival of

Acadian Flycatchers into Ontario. There was a marked complex series of low pressure centres and frontal boundaries on 25-26 April (Figure 5) that likely aided nocturnal migration for Neotropical migrants throughout the eastern continental US (CONUS); their northernmost extent reached extreme southern Ontario. The systems were short lived, providing ideal southerly winds before quickly retrograding to the northeast.

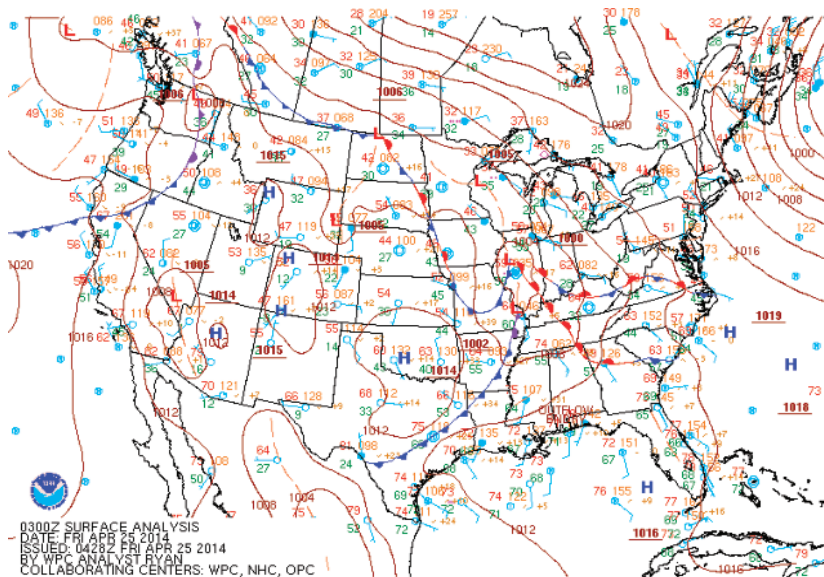


Figure 5. Surface analysis for the continental US at 0300UTC on 25 April 2014 (NOAA 2014a). Elevated warm southerly winds are occurring over SW Lake Erie at this time. UTC denotes Coordinated Universal Time.

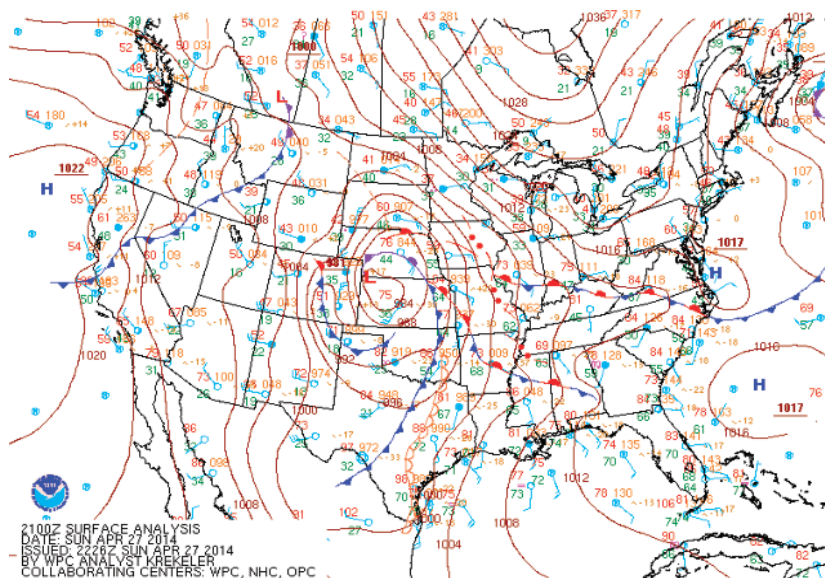


Figure 6. Surface analysis for the continental US at 2100UTC on 27 April 2014 (NOAA 2014b). The newly formed extratropical cyclone (*i.e.* a low-pressure cell) with a peak intensity of 981mb. Elevated southerly warm air is once again reaching extreme SW Ontario (as winds associated with a low pressure cell blow counter clockwise). UTC denotes Coordinated Universal Time.

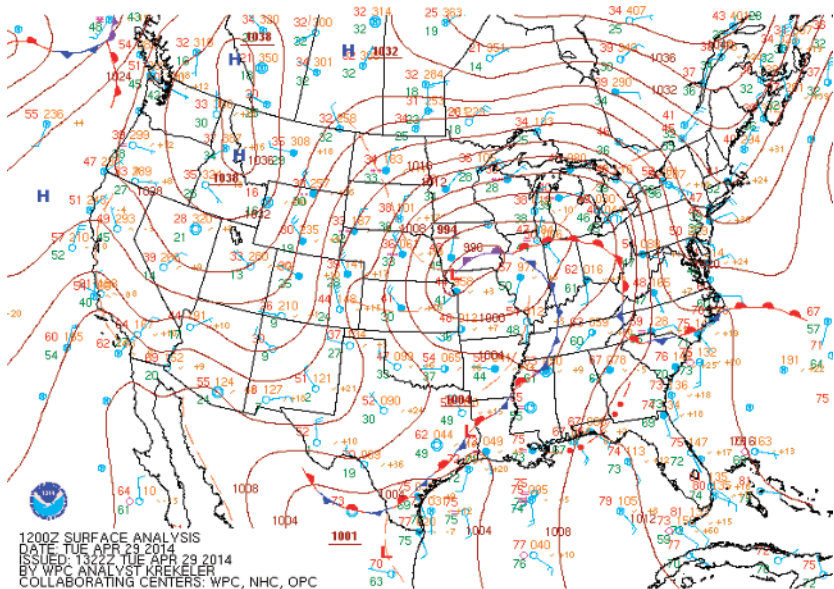


Figure 7. Surface analysis for the continental US at 1200UTC on 29 April 2014 (NOAA 2014c). The blocking pattern continues to hold the weakening low pressure centre in an effective position for northward migration over extreme SW Ontario. UTC denotes Coordinated Universal Time.

On 27 April, cyclogenesis occurred over the central CONUS reaching a peak intensity of 981mb a short time thereafter (Figure 6). Large and powerful, this new low pressure centre was halted almost immediately by a blocking ridge of high pressure, barely moving to the ENE through 1 May and slowly losing strength as time passed. Similar to the previous event (25-26 April), the position of the frontal boundaries likely aided nocturnal migration, with increased wind intensity and storm duration (Figure 7). By 2 May, the blocking pattern was lifted and the remnant low centres moved northeastwards, no longer affecting the CONUS or Great Lakes region.

Discussion

Based on our analysis, April 2014 was exceptional in the sheer number of Acadian Flycatcher records from southern Ontario. The number of individuals from April 2014 equaled the total of all previous April records (1984-2011). The arrival of Acadian Flycatchers in southern Ontario in late April 2014 occurred simultaneously with their arrival across much of the northeastern extent of their range in the US, as would be expected from the phenology and the broad front migration of this species (Whitehead and Taylor 2002, eBird 2014a).

In comparing the 2014 Acadian Flycatcher mean April dates by latitude with the same information from the previous three spring migrations, it is apparent

that 2014 progressed as usual for this species in the US. Hence, we can conclude that given the right meteorological conditions in late April, Acadian Flycatchers (as well as other early neotropical migrants) are to be expected, at least in small numbers, in southwestern Ontario.

Despite the historical tendency for relatively few observers, late April is one of the best times for passerine rarities of significance to occur in southern Ontario (K. Burrell, M. Burrell, and B. Holden pers. obs.), as well as the first month in which Neotropical migrants reach the province. Based on the weather conditions observed in late April 2014, influxes of overshooting spring migrants (*e.g.*, Worm-eating (*Helmitheros vermivorus*), Hooded (*Cardellina citrina*) and Yellow-throated warblers (*Setophaga dominica*) as well as normally early migrants were to be expected throughout southern Ontario (eBird 2014a). Prolonged southerly winds originating from the Gulf of Mexico, particularly at altitudes associated with diurnal passerine migration (*i.e.* 500-1,800m) (Kerlinger and Moore 1989, Weidensaul 2000), were likely the driving force behind these birds (including the Acadian Flycatchers) arriving in Ontario and adjacent regions (Earth Wind Map 2014). As Acadian Flycatchers are known to arrive en masse in the Gulf states of the US in late April (Whitehead and Taylor 2002, eBird 2014a), extratropical cyclones and their associated warm southerly wind flow can advance early migrants (and southern overshoots) originating in the Gulf region to the northeast (*e.g.*, Ontario) ahead of anticipated arrival dates. The prolonged

weather event observed in April 2014 gives credence to this idea, as ideal conditions in southern Ontario led to this record arrival of Acadian Flycatchers.

It is likely that some observers are particularly cautious with identifying Acadian Flycatchers given their overall scarcity in Canada and known challenges separating *Empidonax* flycatcher species (COSEWIC 2010). Based on data from south of the Canadian border, this species should be expected to occur again in late April, particularly during weather events favourable for migration. Increased awareness and the ability to rapidly report observations will better serve our knowledge of the species' migration in Canada, including late-April; when Acadian Flycatchers may not previously have been expected to occur.



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Conclusion

In late April 2014, there was a notable arrival and unusually high number of Acadian Flycatchers observed in southern Ontario. Historically, only six previous records of this species have occurred in Ontario in April. That total was matched with the six observations in 2014. Unusual weather events associated with warm southerly winds have the potential to displace birds in notable numbers ahead of their traditional arrival dates, such as the case in late April 2014 for Acadian Flycatchers. With the predicted likelihood of increased anthropogenic impacts on climate and the correlated increase in storm size and intensity (Emanuel 2005, Anthes *et al.* 2006, Bender *et al.* 2010), it is reasonable to predict increased frequency in the types of events which took place in late April 2014. Examining and studying the impacts of these storm systems on spring avifauna will provide significant information for climate scientists, as well as ornithologists, professional and amateur alike.

Acknowledgements

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