



Common Green Darner by TexasEagle, Courtesy of Flickr

## Hawk Watch Counters Contribute Another Season of Dragonfly Observations

Since 2013, the Hawk Migration Association of North America (HMANA) has partnered with the Migratory Dragonfly Partnership (MDP) to contribute to the growing knowledge of dragonfly migration in North America. Hawk Watch observers who gather every year to document the annual journey of hundreds of thousands of hawks, eagles, and vultures southward to overwintering grounds, are ideally placed to note the migration of dragonflies moving south along many of the same migratory routes. Indeed, this association between migrating birds and dragonflies has led to a coordinated effort to monitor the timing, direction of travel, and dragonfly species involved in migratory flights at sites along the eastern seaboard of the U.S., the Midwest, and Ontario, Canada, for the past four fall migration monitoring seasons.

Though researchers and citizen scientists have joined forces for decades to piece together the flights of both migrating birds and monarchs, the full extent of migration in dragonflies still remains unclear. The nature of dragonfly migrations can be sporadic and discontinuous, but noting the concurrent movement of these migrants with birds helps shed light on timing and intensity of flights. As you can see in the accompanying graph, fall migration for reporting sites begins around the end of August and can continue into early November. Within that span, some days see enormous spikes in the number of passing dragonflies while others have no activity at all. Although the numbers are usually highest in September, 2016 saw a strong two-day migration pulse of 45,000 dragonflies near the end of August in the Central Flyway of North America (see accompanying map).

These migrating dragonflies were reported moving through the Hawk Ridge observatory in Duluth, Minnesota. While this Midwestern site has consistently reported the most dragonflies each year since reporting began in 2013, migration pulses there have never exceeded 7,000 dragonflies in a daily count. Do these pulses correlate with hawk and/or monarch migration occurring in this area? The local geography likely is a strong contributor to the presence of so many migrating birds, and coincidentally dragonflies. The Great Lakes create barriers which funnel migrating animals on the wing as they skirt shorelines like Lake Superior to avoid flying over long expanses of water. With additional years of data, patterns may begin to emerge from these reports.

The best known and most regular dragonfly migrant in North America

is the Common Green Darner (*Anax junius*). Each year Common Green Darners are reported in large flights often sharing the skies with other migrant dragonflies. In fact, mixed-species migrations were noted at most reporting sites, including Illinois Beach State Park—a hot spot of migratory activity in Illinois. Here, and at additional sites in the Great Lakes region, Common Green Darners were joined by Black Saddlebags (*Tramea lacerata*) in large migratory flights. In 2016, these were the two most frequently reported species on the wing—which raises important questions, because we know from other observations along the east coast of Mexico that these two species are seen in much lower proportions compared to the tropical migrants, Spot-winged (*Pantala hymenaea*) and Wandering Gliders (*Pantala flavescens*). With the addition of Bentsen Rio Grande Valley State Park in Texas as a monitoring site in 2016, Common Green Darners were reported almost every observation day, with few Wandering Glider reports and no Spot-winged Glider reports. Does this indicate Wandering and Spot-winged Gliders generally limit their migration to the southern parts of North America? Do Common Green Darners stop for the winter somewhere in northeast Mexico or Florida? What this does tell us is the connectivity between southbound migration flights in the eastern U.S. and that seen in Mexico is still unclear.

Dragonflies retain in their wings a distinctive signature of the hydrogen isotopes from the pond in which they lived as a nymph and emerged. Studies comparing these signatures to the known hydrogen isotope ratios in water across the continent showed that migratory individuals don't all originate in northern ponds, but also from ponds in the southern U.S. and Mexico—although the exact location of emergence is still a mystery.

### Hawk Watch Dragonfly Migration Stats for 2016



OVER 62,000  
DRAGONFLIES  
REPORTED



13 STATIONS  
REPORTING

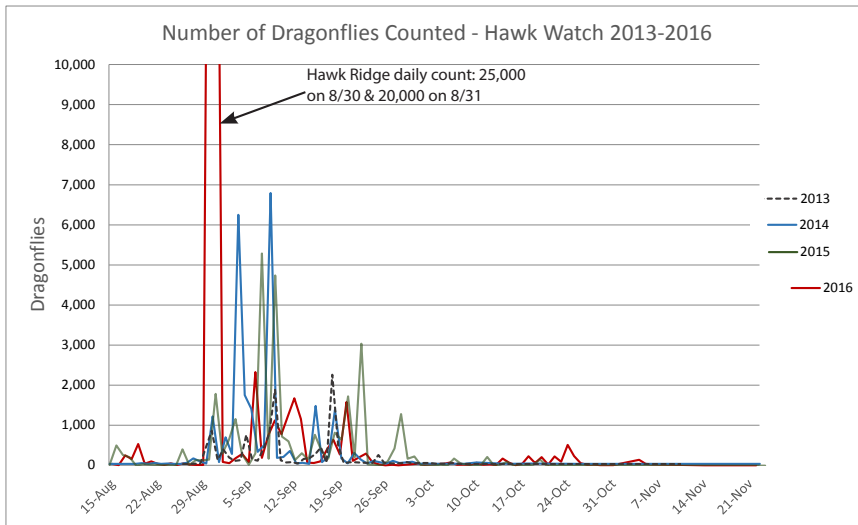


CLOSE TO 700  
RECORDS  
SUBMITTED

- ⇒ Since 2013, 63 observers have submitted over 3,000 reports of dragonfly migration from 21 participating sites.
- ⇒ In 2016, 45,000 dragonflies were recorded passing through the Hawk Ridge observatory over a two-day period in late August.
- ⇒ Each year, the most common dragonfly seen migrating are Common Green Darners (*Anax junius*). Other species seen migrating are Black Saddlebags (*Tramea lacerata*), Twelve-spotted Skimmers (*Libellula pulchella*) and Autumn Meadowhawks (*Sympetrum vicinum*).

Questions such as these highlight the need to increase the network of MDP observers not only throughout the east coast of North America down into Florida, but also to the west in Texas and northern Mexico. Given the wide geographic scope of migration, citizen science observations like these are critical to further our understanding of this phenomenon.

Thank you to the following observatories that contributed to dragonfly migration monitoring from 2013-2016: Bentsen Rio Grande Valley State Park (new 2016 site!), Botsford Hill; Carter Hill; Chestnut Hill; Cooper, Maine; Grandfather Mountain; Hanging Rock Tower; Harvey's Knob; Hawk Mountain Sanctuary; Hawk Ridge; Holiday Beach Conservation Area; Illinois Beach SP; Kiptopeke; Lighthouse Point; Mahogany Rock; Middle School; Pack Monadnock; Pilot Mountain State Park (new 2016 site!); Rocky Knob; Rose Tree Park; and Wildcat Ridge.



Number of dragonflies counted flying past Hawk Watch observatories in North America from 2013 to 2016.

## Spring and Fall Migration Monitoring

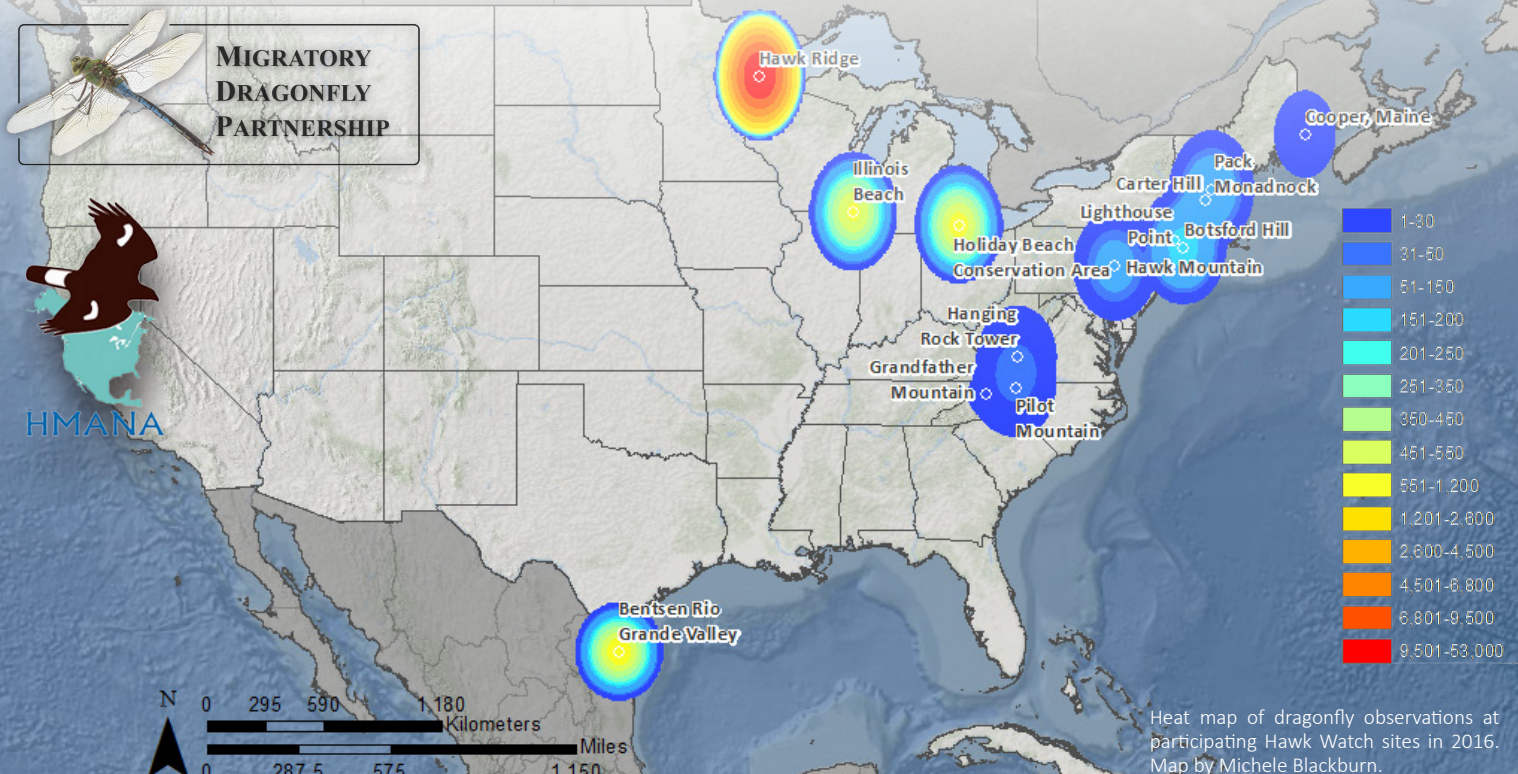
*Are you a Hawk Monitor? Please Consider Adding Dragonfly Migration Monitoring to Your Monitoring Location*

Dragonflies often join raptors on the epic migratory journey for both north and southbound flights. Broadening our efforts at Hawk Watch sites by increasing the number of locations taking observations and gathering data on both fall and spring migrations, is integral to understanding the complete cycle of migration. Though more diffuse than fall migration, the offspring of dragonflies who moved south for the winter migrate north to ponds and wetlands in North America to breed. Establishing monitors at additional sites will give us a more complete picture of migration activities and pathways in North America. Please consider monitoring dragonflies as they head north in spring and south in the fall. We need your help to collect long-term data on the movements of migrating dragonflies!

✈ Sites interested in participating should contact Site Coordinator, Julie Tilden at [brown@hmana.org](mailto:brown@hmana.org).

✈ For more information about HMANA's involvement in MDP, monitoring guidelines, and protocol, please visit: <http://www.hmana.org/migratory-dragonfly-partnership>.

## Hawk Watch Dragonfly Migration Data 2016



Heat map of dragonfly observations at participating Hawk Watch sites in 2016. Map by Michele Blackburn.