

Field Guide to Migratory Dragonflies



MIGRATORY DRAGONFLY PARTNERSHIP

This guide is intended as an aid to identify migrating dragonflies.

Dragonflies are not difficult to identify when perched at close range or in the hand, but it is more difficult when they are moving rapidly in flight, which of course is what migratory dragonflies are likely to be doing. Nevertheless, all of them perch at some time, so it is possible with persistence to get a good look at and identify dragonflies that may be passing through your area.

A basic knowledge of dragonfly anatomy is necessary. Dragonflies have a head, thorax, and abdomen.



The wings are attached to the top of the thorax and the legs to the bottom, so it can be seen that the thorax is tilted backwards. Thus the part between the head and the wing bases is the front. An insect thorax has three parts, each with a pair of legs. The prothorax in dragonflies is a small neck-like section separated from the other two sections, which are fused into a synthorax; they bear the middle and hind legs and the two pairs of wings, and much of their bulk is taken up by the big flight muscles. The abdomen has 10 segments, numbered from front to rear. Segment 1 (S1) is very small. The sexes can be distinguished by the shape of the abdomen. In males the reproductive apparatus is visible as

a distinct bulge, with structures called hamules projecting below S2 and plainly visible from the side. They are more visible in some species than others, but a close look should distinguish them. Females lack the projecting structures and instead have a generally wider abdomen, enlarged to carry lots of eggs. The appendages at the tip include two pointed cerci in both sexes, and a broad appendage in males, below and shorter than the cerci.

FLIERS vs. PERCHERS

Dragonflies have two types of foraging behaviors. Fliers fly around to capture insect prey or look for other dragonflies, and perchers rest on perches much like flycatching birds do, keeping watch for potential prey, predators, or members of their own species. Some of the migrant species are fliers and others are perchers; this will be indicated in the guide. Perchers orient more or less horizontally when perched, and they often turn their heads, actively aware of the environment. Fliers do not look around while perched and tend to hang at a diagonal or even vertically below their perching substrate.

MIGRANT DRAGONFLIES

Note that all dragonflies in migration will be doing the same thing, flying on a steady course in one direction. At this time, perchers and fliers will behave similarly, and some of the many field marks described below will not be visible. Capture or photography of flying individuals might then be essential for positive identification, but migratory dragonflies can also land during migration, especially when tired or when ready to roost.

This guide focuses on five of the 16 confirmed migrant species in North America. Four are of the flier type: one darner, two gliders, and a saddlebags. The other well-known migrant, a meadowhawk, is a percher. These species are emphasized in this guide. After the primary species, an additional 11 species considered migratory at some places and times in North America are described. 



Photo: © Dennis Paulson

Common Green Darter female

Key Identification Features

- flier
- large size (length 3 in [7.6 cm], wing-spread 4.5 in [11.4 cm])
- long abdomen
- eyes dull greenish to bluish to brown
- thorax green
- abdomen blue in male, green in female, violet in immatures
- dark line down middle of abdomen

Migration and Distribution

Appears in north early in spring, before local dragonfly emergence, presumably

migrates from south. Larvae develop through summer, emerge in July/August, then fly south. Breeds in south and tropics in fall/early winter; those larvae develop through winter, emerge in spring, and the cycle repeats. There are also resident populations that do not migrate.



Photo: © Dennis Paulson

Common Green Darter tandem pair, female (right) ovipositing



Common Green Darter mating pair

Photo: © Dennis Paulson



Photo: © John C. Abbott/About Nature Photography

Common Green Darter male

Similar Species

These all have a green thorax, usually shining green or blue eyes; not known to migrate or occur in swarms.

Comet Darter (*Anax longipes*) – eastern; slightly larger; abdomen reddish in both sexes, may have pale bluish spots in female.

Regal Darter (*Coryphaeschna ingens*) – southeastern; thorax with obvious brown stripes; abdomen longer, more slender, black with fine green lines.

Similar Tropical Species

Amazon Darter (*Anax amazili*) – abdomen with whitish spots, sides of first segment often with whitish ring; eyes gray or violet.

Blue-spotted Comet Darter – (*Anax concolor*) – abdomen brown with bluish spots in both sexes.

Blue-faced Darter – (*Coryphaeschna adnexa*) – smaller, more slender; abdomen black with fine green lines.

Mangrove Darter – (*Coryphaeschna viriditas*) – more slender; abdomen black with fine green lines.



Common Green Darter immature female

Photo: © Dennis Paulson



Photo: © John C. Abbott/Abbott Nature Photography

Wandering Glider male

Key Identification Features

- flier (broad hindwings)
- medium size (length 2 in [5.1 cm], wingspread 3 in [7.6 cm])
- yellow to yellow-orange all over
- eyes red, face yellow to orange
- prominent dark markings down center of abdomen
- clear unmarked wings

Migration and Distribution

Individuals move north from the tropics during summer (farther north in east than west), breeding along the way. Migratory flights south in fall, presumably their offspring but poorly known. Most widely distributed dragonfly and highly migratory through all of its worldwide range.



Photo: © John Abbott/Abbott Nature Photography

Wandering Glider female



Photo: © Greg Lasley Nature Photography

Wandering Glider male



Wandering Glider male

Photo: © Netta Smith

Similar Species

Spot-winged Glider (*Pantala hymenaea*) – same size and shape but slightly darker, more reddish or brownish, and with brown spots at base of hindwings (not always easily seen in flight).

Four-spotted Skimmer (*Libellula quadrimaculata*) – percher rather than flier, browner and with spots in wings; confusion possible only at a distance.

Variiegated Meadowhawk (*Sympetrum corruptum*) – percher, considerably smaller and with yellow markings on thorax and white markings on abdomen; male with much red; although distinctly different, migration flights might cause confusion.



Photo © John C. Abbott/Abbott Nature Photography

Spot-winged Glider immature female

Key Identification Features

- flier (broad hindwings)
- medium size (length 2 in [5.1 cm], wingspread 3 in [7.6 cm])
- brownish all over
- eyes red, face bright red in mature males
- diagonal whitish stripe on side of thorax in females and immatures
- dark markings down center of abdomen less distinct
- small dark spot at base of hindwings

Migration and Distribution

Individuals move north from tropics during summer (farther north in east than west, usually earlier than Wandering), breeding along the way. Migratory flights south in fall, presumably their offspring but poorly known.

Similar Species

Wandering Glider (*Pantala flavescens*) – same size, shape and behavior, but paler, more yellow to orange and lacking dark spots at hindwing bases.

various saddlebags

(*Tramea* spp.) – similar size and shape but hindwing markings extend entire width of wing, may be quite narrow or much larger than spot on Spot-winged.



Spot-winged Glider male



Spot-winged Glider male

Photos © Carel de Haereth

Similar Tropical Species

These species are fliers with dark markings at wing bases. All are smaller than *Pantala*, and the dark wing markings are more at the front of the wing base. Abdomen spindle-shaped in males, wider in middle than at either end (females more parallel-sided, as in *Pantala* gliders).

Garnet Glider

(*Tauriphila australis*) – dark hindwing markings small, slightly larger in female; abdomen red in male, duller in female, with dark central stripe near tip.

Arch-tipped Glider

(*Tauriphila argo*) – like Garnet Glider but red (male) or orange (female) abdomen unmarked with black stripe at tip; basal wing spots a bit larger (not as large as saddlebags).

Aztec Glider (*Tauriphila azteca*) – differs from other *Tauriphila* and *Pantala* gliders by yellow abdomen with irregular dark brown bands across it.

Hyacinth Glider (*Miathyria marcella*) – even smaller than *Tauriphila* gliders, hindwing markings extend across entire width of wing.

Marl Pennant (*Macrodiplax balteata*) – percher on tips of upright stems, but often seen in flight; small hindwing spot somewhat like Spot-winged, but forewings also with hint of basal spot; male all black, female with heavily patterned thorax and light brown, black-tipped abdomen.



Spot-winged Glider male

Photos © Netta Smith

Key Identification Features

- flier
- medium size (length 2 in, [5.1 cm], wingspread 3 in [7.6 cm])
- black all over
- female and immature with yellow spot on S7
- broad black “saddlebags” at base of hindwing



Black Saddlebags male
Photo © Dennis Paulson

Migration and Distribution

Individuals move north from tropics during summer, breeding along the way. Migratory flights south in fall, presumably their offspring but poorly known. Also resident populations.



Photo © John C. Abbott/Abbott Nature Photography

Black Saddlebags male



Black Saddlebags male
Photo © Walter Chadwick

Similar Species

Carolina Saddlebags (*Tamea carolina*)

– similar shape and silhouette, but body and wings red to reddish-brown.

Red Saddlebags (*Tamea onusta*)

– similar shape and silhouette, but body and wings red to reddish-brown.

Widow Skimmer (*Libellula luctuosa*)

– percher, with extensive dark marking in forewings and hindwings; mature males with white on wings, pale gray abdomen.

Similar Tropical Species

Sooty Saddlebags (*Tamea binotata*) – slightly smaller, black hindwing patches much narrower.

Marl Pennant (*Macrodiplox balteata*) – percher, male black with smaller hindwing patches; female quite different.



Black Saddlebags male
Photo © Dennis Paulson

VARIEGATED MEADOWHAWK (*Sympetrum corruptum*)



Key Identification Features

- percher
- small (length 1.5 in [3.8 cm], wing-spread 2.3 in [5.7 cm])
- mostly red (mature males) to yellowish-brown (females and immatures)
- two yellow side spots low on thorax (obscured in mature males)
- yellow and white pattern along abdomen (obscured in mature males)

Migration and Distribution

Mostly western to Midwestern species. Individuals appear in north in spring before local emergence, breed during summer. Massive emergence in late summer, with large southbound migrations in western mountains and along Pacific Northwest coast. Southern populations presumably breed during winter. Also resident populations, but much to be learned.



Similar Species

Cardinal Meadowhawk

(*Sympetrum illotum*) – male bright scarlet, female brown or red-brown; pale spots low on sides of thorax, no complex abdominal markings.

Striped Meadowhawk

(*Sympetrum pallipes*), **Red-veined Meadowhawk** (*Sympetrum madidum*) – pale stripes on thorax, jagged black markings on sides of abdomen in male, dark longitudinal stripe on sides of abdomen in female.

other red or brown meadowhawks (*Sympetrum* spp.) – other species lack spots or stripes on thorax, light markings on abdomen; slightly smaller and more slender than Variegated.

Wandering Glider (*Pantala flavescens*) – flier; larger, yellow to orange, no pale markings on thorax or white markings on abdomen.



Similar Tropical Species

Red-tailed Pennant

(*Brachymesia furcata*) – red-brown thorax, bright red abdomen (male and some females) or plain brown (most females); only marking is faint black median stripe at tip.

These species have been found in assemblages of dragonflies that were thought to be in migration, mostly along the North Atlantic coast in fall.

SWAMP DARNER (*Epiaeschna heros*)



Photo: © Dennis Paulson

Swamp Darner male

Description

This very large darner, longer than the Common Green, has a brown thorax with prominent green stripes and a dark brown to black abdomen, ringed with fine green lines. Only the Regal Darner (*Coryphaeschna ingens*), with more green than brown on the thorax, could be mistaken for it. Both species may be in feeding swarms, but only the Swamp Darner has been observed in directed migration in the northeastern United States.

TAPER-TAILED DARNER (*Gomphaeschna antilope*)



Photo: © Dennis Paulson

Taper-tailed Darner male

Description

Very small darner of the southeast, with scattered records north to Michigan and New York. Overall dark and rather dull-colored, with irregular and rather obscure paler stripes on the thorax and paired spots on the abdomen, some of them dull orange. Although very poorly known in general, individuals have regularly been found in south-bound migratory movements along the northeast coast.

STRIPED SADDLEBAGS (*Tamea calverti*)

Description

Four saddlebags species have “narrow” saddles, with only the extreme base of each hindwing darkened. This is a red species; thorax has two pale diagonal stripes on either side, conspicuous in immatures and females but obscured in males. The abdomen has a black tip, with S8 and S9 almost entirely black. Females have a brown thorax and reddish-tan abdomen. The Striped is the most northerly ranging of the narrow-saddle saddlebags, with vagrant individuals moving north in summer almost to the Canadian border. Large movements have been seen at several tropical localities, probably not latitudinal migrations.



Photo: © Dennis Paulson

Striped Saddlebags male

CAROLINA SADDLEBAGS (*Tramea carolina*)

Photo © Dennis Paulson

Carolina Saddlebags male

Description

Very much like Red Saddlebags, but males have dark purple face and darker eyes. Females even more similar to female Red, but have a touch of purple on the face. Both sexes have S8 & S9 mostly black, while in Red, there are black spots on top of S8 & S9. Both body size and wing patches are slightly larger than in Red, not very apparent in the field.

This southeastern U.S. species is thought to be partially migratory; individuals appear in spring in northern states, well to the north of where it is common. Small numbers are seen in Atlantic coast migratory movements in fall. All saddlebags are similar in habits to the Black Saddlebags and may be similarly migratory, although if so, it has been less obvious.

RED SADDLEBAGS (*Tramea onusta*)

Photo © Dennis Paulson

Red Saddlebags male

Description

Like Black Saddlebags, but entire body is red (tan in immatures); S8 & S9 have black spots on top. The broad hindwing patches ("saddlebags") are red to almost purple. Another tropical and southern species, it is common in the Great Plains, east to the Mississippi and Ohio rivers. It ranges

widely in the southwest but is uncommon, perhaps only a sporadic migrant, east of the Appalachians; apparently resident in peninsular Florida.

BAND-WINGED DRAGONLET (*Erythrodiplax umbrata*)

Description

Males are distinct — medium-sized skimmers with black body and prominent wide black band across midlength of each wing. Females and young males are yellowish to tan to khaki; the thorax is brown in front with a vivid white midline. There are black or dark brown markings down the center and low on each side of the abdomen, becoming larger to the rear and finally almost covering



Photo © Dennis Paulson

Band-winged Dragonlet male



Photo © Dennis Paulson

Band-winged Dragonlet female

S8 & S9. Terminal appendages in both sexes are whitish. A minority of mature females look like males, with black bodies and wing bands, but most just get darker and duller as they age. Wing bands are visible as brown washes in young males and darken slowly with age. This species is abundant in the tropics and north into southern

United States. It has bred as far north as Ohio, but rarely. A huge aggregation estimated at millions of individuals was once observed in July on the Texas coast, in migration or dispersing from a very successful breeding population.

BLUE DASHER (*Pachydiplax longipennis*)

Description

Immatures and females of this small skimmer have a conspicuously striped thorax and abdomen. The striped abdomen helps distinguish Blue Dashers from many other species with a striped thorax. Mature males are the most commonly seen individuals, and have a pruinose blue abdomen, black at the tip; striking green eyes; and a white face. In drier parts of the west, the thorax also becomes pruinose blue, and mature females may also become pruinose. One of the most common and widespread North American species, Blue Dashers have been seen in fall concentrations of dragonflies on the New England coast. There is no other evidence for migration in the species.



Blue Dasher male

Photo: © Dennis Paulson



Blue Dasher female

Photo: © Dennis Paulson

AUTUMN MEADOWHAWK (*Sympetrum vicinum*)

Description

Mature males and some females of this small species are bright red all over, with a fine black line on the top of S9 and red-brown legs. Immatures are yellow to orange, with yellow legs. Females have a prominent scoop (the subgenital plate) extending under S9. Most other small red dragonflies (several meadowhawk species) in the same areas have black legs and more extensive black markings on the abdomen, and females lack the obvious scoop. Mass movements of this species have been observed in fall in New England, but there is no real evidence of latitudinal migration as such.



Autumn Meadowhawk male

Photo: © Dennis Paulson



Autumn Meadowhawk female

Photo: © Dennis Paulson

GREAT PONDHAWK (*Erythemis vesiculosa*)

Description

Unmistakable if seen well. Entirely green with dark bands across the abdomen; larger than any other skimmer. They approach darner size, but are perchers. Males fly over their breeding ponds but eventually land; when not at breeding sites they are often in open woodland, even in small clearings under the canopy. Perhaps not

a latitudinal migrant, this tropical species has nevertheless been seen in large numbers in directed flights in south Florida and other tropical localities.



Great Pondhawk male

Photo: © Dennis Paulson

TWELVE-SPOTTED SKIMMER (*Libellula pulchella*)

Description

Large skimmer, easily recognized by the three large black spots spread across each wing, from base to tip. The thorax is brown with two diagonal yellow stripes on either side, and the abdomen is brown with a yellow stripe along each side. In mature males, white spots appear between the black spots on the wings, and the abdomen becomes pruinose



Photo: © Dennis Paulson

Twelve-spotted Skimmer male

whitish. The only other skimmer in its range with similar large black wing spots is the female Common Whitetail, which has whitish markings on the sides of each abdominal segment rather than a continuous yellow stripe. Twelve-spotted Skimmers have been seen in southward movements of dragonflies



Photo: © Dennis Paulson

Twelve-spotted Skimmer female

along the Atlantic coast, and there is some indication that they turn up in the south only late in the season, possibly as migrants from the north.

PAINTED SKIMMER (*Libellula semifasciata*)

Description

Painted Skimmers live up to their name, and the wings glow with color. The thorax is a rich brown with two whitish to yellow diagonal stripes on each side. The abdomen has yellow edges and a jagged black central stripe on the last few segments. Wings are marked with a brown streak at the base and brown spots at the middle and near the end. Veins along the front of



Photo: © Dennis Paulson

Painted Skimmer female

each wing and the base of the hindwings are largely yellow. Some Painted Skimmers appear in spring in the northern states and extreme southern Canada before they would have emerged locally, presumably migrants. They have also been observed in autumn along the northeast coast in apparent directional flight.

Other Species

There have been additional reports of migratory flights in still other species, so observers should be on the lookout for such flights, or even individual dragonflies of different species that seem to be associated with migratory flights of the well-known species presented here.



Common Green Darner
Anax junius



Black Saddlebags
Tamea lacerata



Variegated Meadowhawk
Sympetrum corruptum

Illustrations by Peter Burke



Wandering Glider
Pantala flavescens



Spot-winged Glider
Pantala hymenaea



Provided for scale:
Monarch Butterfly
Danaus plexippus

Illustrations by Peter Burke

The Migratory Dragonfly Partnership (MDP) is a collaboration among dragonfly experts, nongovernmental programs, academic institutions and federal agencies from the United States, Mexico and Canada.

MDP projects combine research, citizen science, and education and outreach to better understand North America's migrating dragonflies, and to promote conservation of the habitat on which they rely.

MDP steering committee members represent a range of organizations, including:

Ontario Ministry of Natural Resources
Peggy Notebaert Nature Museum
Pronatura Veracruz
Rutgers University
Slater Museum of Natural History,
University of Puget Sound

Smithsonian Conservation Biology Institute
University of Texas at Austin
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*Working to Understand and Conserve
North American Dragonfly Migration*

For more information about the Migratory Dragonfly Partnership, please visit us at www.migratorydragonflypartnership.org or e-mail us at dragonfly@xerces.org.

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