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The Sky Island News

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"You'll never do a whole lot unless you're brave enough to try."

Dolly Parton

It was great to see some of you at last month's birding festivals! I hope that you had a good time. A lot of birds were seen during the events! For the first time that I recall since moving to Arizona, we had a tornado warning during one of the blacklight events in Carr Canyon! That was nuts!



Santa Cruz River Dragonfly Festival, with events spread throughout the month. There will be tours, presentations, performances, and more. For the full list of events and to register, please visit

<https://sonoraninstitute.org/events>.

I hope you enjoy this month's issue!

September Field Trip

Pena Blanca Birding. Tuesday, September 29. 8AM – 12 PM. Cost is \$10/person. Email (jeff@skyislandtours.com) to register. **LIMIT 15 PARTICIPANTS.**

This month we head south to Pena Blanca lake to see how migration is progressing. We can expect to see a variety of songbirds, as well as some waterfowl and raptors. Hopefully it will be cooler by then, too! We will meet in the Safeway Shopping Center at I-19 and Continental Road on the Safeway side of the parking lot. Bring water, insect repellent (just in case), and snacks.

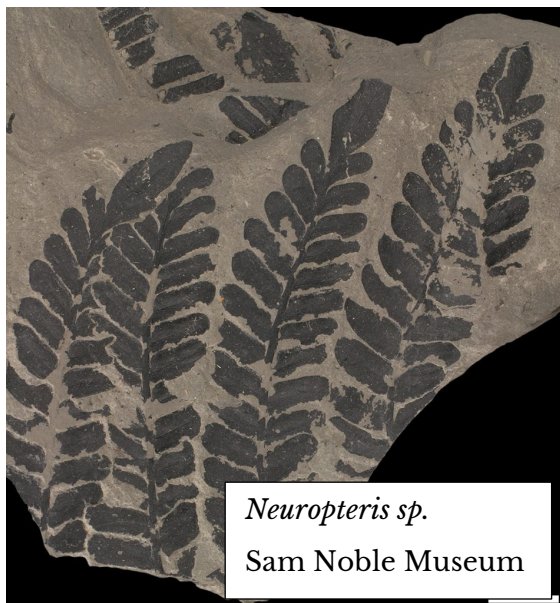


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September Classes

Dragonflies and Damselflies. Friday, September 11. 10AM-12PM. Virtual Class Via Zoom. Tucson Botanical Gardens. To register, use this link <https://tucsonbotanical.org/class-schedule/>.

Dragonflies and damselflies are remarkable creature that can be found in most freshwater habitats from backyard ponds to raging mountain torrents. They are predators throughout their lives, first as nymphs underwater and rule the skies as adults. This class introduces these insects, focusing on their diversity, life cycle, and habits. We will also talk about the basics for identifying them, so that students will be ready to head to the nearest wetland to observe them. The Santa Cruz Dragonfly Festival runs all of September and this class supports the wonderful event!



The Evolution of Plants. Friday, September 18. 10AM-12PM. Las Campanas (565 W. Belltower Dr., in Green Valley). To register, call 648-7669 or visit <https://www.gvrec.org>.

The Evolution of plants is one of the most important stories of life on Earth. From single celled algae in the sea to towering redwoods and the spectacular diversity of flowering plants, they have made all other life possible. This class traces the remarkable story of the evolution of plants.

Pima County Presentations

These online programs are free but you must register in order to receive the Zoom link to the presentation. The programs are recorded and all who have registered will receive the link to the recording. If you have questions or need assistance, contact us at: eeducation@pima.gov.

Once registered you will receive a link to the Zoom presentation.



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Adventures in Birding: Yellow-billed Cuckoo and Willow Flycatcher. Thursday, September 3. 7-8PM. Virtual Presentation via Zoom. Free, but registration is required. To register visit <https://bit.ly/Nature-Online-Tickets>. Once registered you will receive a link to the Zoom presentation.

We continue our celebration of the 25th anniversary of the Sonoran Desert Conservation Plan with a look at 2 birds that are monitored under the plan. Join us for look at these elusive and uncommon birds.

Seasonal Naturalist Fireside Chat: Late Summer. Saturday, September 5. 7-8PM. Virtual Presentation via Zoom. Free, but registration is required. To register visit <https://bit.ly/ticketsEE>. Once registered you will receive a link to the Zoom presentation.

Late summer is an interesting time of year in the natural world, as summer transitions into fall. We will look at what is going on in Nature at this time of year. After this brief introduction, we open the floor to your questions about Nature.

Order Up! Pond Damsels. Tuesday, September 8. 7-8PM. Virtual Presentation Via Zoom. Free, but registration required. To register visit <https://bit.ly/Nature-Online-Tickets>. Once registered you will receive a link to the Zoom presentation.

The 8th annual Santa Cruz River Dragonfly Festival is here and to celebrate we explore the pond damselfly family, the largest damselfly family in the world. If you see a damselfly just about anywhere in the US and Canada, it is likely a pond damsel. The presentation will help get you ready for the festival field trips (or a trip to your local pond or stream).

Lifestyles of the Smooth and Scaly: Threadsnakes and other Primitive Serpents. Monday, September 14. 7-8PM. Virtual Presentation via Zoom. Free, but registration is required. To register visit <https://bit.ly/Nature->



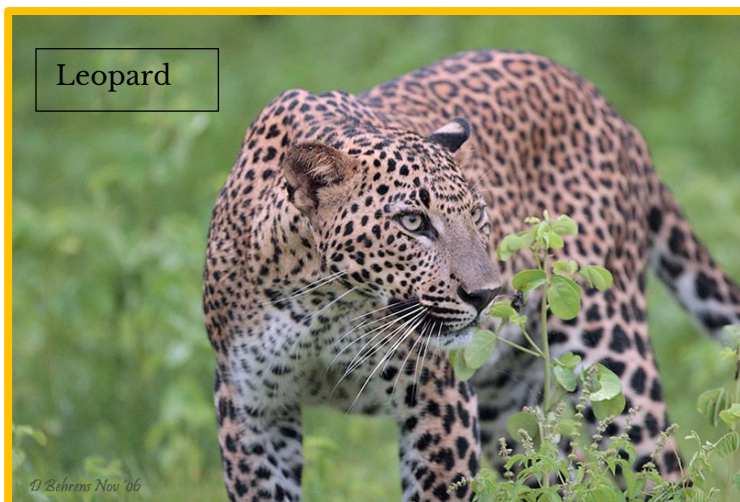
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[Online-Tickets.](#) Once registered you will receive a link to the Zoom presentation.

This month we explore the world's most primitive snakes, threadsnakes, blindsnakes, and some others, not all of which occur in North America. Some of these snakes look a lot more like a worm than a snake. Join us for a look at the low branches of the snake family tree.

Order Up! Bonus Episode! Skimmers. Wednesday, September 16. 7-8PM. Virtual Presentation Via Zoom. Free, but registration required. To register visit <https://bit.ly/Nature-Online-Tickets>. Once registered you will receive a link to the Zoom presentation.

This bonus episode of Order Up investigates the skimmer family, the most likely group of dragonflies to be noticed by most people. Skimmers are a colorful and common group that can be seen at most ponds and streams. The presentation will help you get ready for the festival field trips (or a trip to your local pond or stream).



The World of Mammals: The Big Cats. Tuesday, September 29. 7-8PM. Virtual Presentation via Zoom. Free, but registration is required. To register visit <https://bit.ly/ticketsEE>. Once registered you will receive a link to the Zoom presentation.

This month we tour the world to look at the big cats, some of the most charismatic and feared animals on Earth. We go from the Brazilian Pantanal to the Himalayas and Siberia on our trip. It will be an exciting journey!

Mound Makers of Parks and Yards

Have you ever wondered who is responsible for the seemingly random piles of dirt in the grass of urban parks, yards, and golf courses? It is as if someone just took a little pail of earth and dumped it in the grass. No opening is visible, just a pile of dirt.



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These mounds of freshly excavated soil are the handiwork of pocket gophers. More specifically, Botta's Pocket Gopher (*Thomomys bottae*), at least in the desert valleys of southeastern Arizona. The head-body length is 5 inches, with the tail adding a couple of more inches to the total length. Botta's, like other pocket gophers, are variable in color, ranging from pale blonde to almost black. The individuals I have seen in southern Arizona are a rich brown color with black on the face. As a group pocket gophers are very good at matching their pelage color with that of the soil in which they live.



Sam Kieschnick

Pocket gophers are vegetarians, feeding on roots, tubers, and green vegetation, which sometimes gets them in trouble with gardeners, greens keepers, and home owners. They also run afoul with the same people for the

aforementioned mounds of earth resulting from their excavations. They can occasionally be observed at the mouth of the burrow, pushing out newly excavated dirt. They may also be seen on the surface gathering leaves and stems in close proximity to the burrow entrance. When such activities are completed pocket gophers seal the entrance with a plug of soil so there is no visible opening.

Pocket gophers are well adapted to their mostly subterranean life. The eyes and ears are small. The front feet are powerful and end in large claws on the toes for digging. They also use their enlarged incisor teeth when excavating and can close their lips to prevent dirt from getting in the mouth. They have fur-lined external cheek pouches for transporting food



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to storage areas in the burrow. The fur is short and velvety, allowing for easy movement in any direction in the burrow system. Structurally, pocket gophers look like furry sausages.

Pocket gophers are in the Geomyidae ('earth mouse'), with 8 genera and 50 species. The family is found only in the Americas with 3 genera and 18 species in the US and Canada. Their closest relatives are the kangaroo rats and pocket mice in the Heteromyidae. Botta's Pocket Gopher was described in 1836 by French zoologists Joseph Eydoux and Paul Gervais, who named after Paolo Emilio Botta, a naturalist who explored California in the 1820s.

The next time you are in a well-manicured park look for the mounds of dirt among the grass. You may catch a glimpse of a pocket gopher. I have seen them at the Paton Center for Hummingbirds while sitting in the shade under the ramada in the back yard. Give it a shot. You may get lucky, too!

What's in a Name – Our Large Hummers

When considering birds as diminutive as hummingbirds, large is a relative term. For the purposes of this article. I am classifying North American hummers around 5 inches long as 'large.' With that limit in mind, 4 species meet the criteria, 2 as regular breeders in southeastern Arizona, another as a stray to our region, and the fourth is an almost annual visitor to south Texas.



The most widespread large hummer in North America is Rivoli's (*Eugenes fulgens*), with a breeding range extending to northern Arizona, western New Mexico, and west Texas. The common name is a patronym honoring Francois Victor Massena, the 2nd Duke of Rivoli, a French ornithologist and possessor

of a large collection of hummingbirds. The species was named by another French ornithologist, Rene Lesson, when he described it as *Ornismya rivoli*.



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However, as was often the case back in the 1800s, it had already been described, in this case by William Swainson, in 1827, thus relegating Lesson's name as a synonym. Swainson's genus name translates as 'noble' from the Greek. The species name is Latin for 'glittering.'

Both of these names are appropriate for such a beautiful bird! For a time it was known as the Magnificent Hummingbird. However, populations in southern Central America were split from those in North America in 2017 as Talamanca Hummingbird (*E. spectabilis*) and the common name for populations in the US reverted back to its original common name, Rivoli's Hummingbird.



More restricted in distribution than the previous species is Blue-throated Mountain-Gem (*Lampornis clemenciae*), most numerous in the Chiricahua Mountains but sometimes seen in other Sky Island ranges. The genus name translates as 'torch bird.' This is a reference to the brilliant gorget color of Amethyst-throated Hummingbird, a congener

from Mexico and northern Central America. The specific epithet is a tribute to Marie-Clémence Lesson née Dumont de Sainte-Croix (that is a name), botanical illustrator and wife of our friend Lesson, who described the bird in 1830.

In 2019 the American Ornithological Society, changed the name from the plain Blue-throated Hummingbird to the current, more evocative, name to bring it in line with its 6 congeners. The subspecies in southern Arizona is *bessophilus*, which means 'wooden glen loving,' an apt name as the species is found in montane riparian woodlands.

A highly prized stray to southern Arizona is Plain-capped Starthroat (*Helioaster constantii*), which has bred in the region. The genus name is Greek for 'sun searcher.' The species name is a tribute to Charles Constant, French physician, taxidermist, and collector. The species has the longest bill, proportionally, of any North American hummingbird. The Arizona



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records have come from Cochise, Santa Cruz, and Pima counties. Another French ornithologist, Adolphe Delattre, described Plain-capped Starthroat in 1843 from birds collected in Costa Rica.

The 3 species above are fairly close relatives as they all belong to the tribe Lampornithini in the subfamily Trochilinae. The last large North American hummingbird is in a different tribe, the Polytmmini, which is part of the subfamily Polytminae. Mainly breeding in Mexico, northern Central America, and northern South America, Green-breasted Mango (*Anthrocothorax prevostii*) can be distinguished from other large hummers in our area by its curved bill.

The genus name translates from Greek as 'coal chest,' for the black markings on the throat and breast of the birds in this genus (of which there are 8). The species name honors another Frenchman, naturalist and illustrator Guillaume Florent Prévost. Rene Lesson described this dramatically dimorphic hummingbird in 1832.

These large, relatively speaking, birds are truly delights to see. A couple can be seen at feeders in southeastern Arizona. The others will require more luck. May luck be on your side!

The Lizard that likes it Toasty

If one lives someplace where it is hot, and retiring to air conditioning is not an option, it is advantageous to tolerate heat. For one desert lizard, it never seems to get too hot. Desert Iguana (*Dipsosaurus dorsalis*) are most active at



temperatures above 95° F and can have body temperatures above 113°F, well above the lethal limit for other reptiles.

Desert Iguanas are large, with snout-vent lengths to almost 6 inches. The tail is also long, up to 1.75x the body length. They are pale gray or whitish with reddish



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markings. The snout is blunt and a crest of enlarged scales extends down the midline of the back and onto the tail. The last 2 characteristics will distinguish these lizards from Tiger Whiptail (*Aspidoscelis tigris*), a species that is not really all that similar but could potentially be a point of confusion.

Creosote Bush is good indicator of Desert Iguana habitat, as the lizard is usually found in areas where the plant is present. The substrate can be sandy or rocky.

Like most iguanas (Iguanidae), they are herbivorous, feeding on the leaves and fruit of many plants including Creosote Bush. They will also occasionally consume insects.

When the desert turns cold, Desert Iguanas retreat to burrows to brumate. Mating occurs in the spring shortly after emergence. Females lay 1 clutch per year, with clutch size of 3 – 8 eggs. The eggs hatch in late spring or summer and the hatchlings grow quickly.

They range in the Mojave and Sonoran Deserts from southeastern California, southern Nevada, and western Arizona, south to Baja, Sonora, and northern Sinaloa in Mexico. In southern Arizona they are found mostly west of Tucson but can be found on the west side of the city. As the desert heats up in summer Desert Iguanas can sometimes be seen by cruising quiet desert roads through suitable habitat in daylight. They often take shelter in the shade of vegetation, where their patterning can make them difficult to detect. El Rio Preserve in Marana is another place to see these fascinating lizards.

Butterfly Profile: Bordered Patch

One of the field trips that I led for Southwest Wings took us to Copper Canyon at the southern end of the Huachuca Mountains. Our primary quarry was birds but we noticed quite a few butterflies. At a small puddle along the side of the road we observed a ‘puddle party,’ where many butterflies alight at mud to imbibe salts. There were dozens of butterflies attending the party. The majority were Bordered Patch (*Chlosyne lacinia*), a member of the Nymphalidae, the brush-footed butterflies.

One of the noteworthy features of Bordered Patch is the astonishing amount of variation on the upper side of the wings. The ground color of



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the wings is black, spotted and banded with white, cream, buff, and orange.



The amount and intensity of these markings accounts for the variation exhibited by Bordered Patch. Conveniently, the markings on the underside of the wing are far more consistent and help to identify the species almost regardless what the top side looks like. The key field mark is the broad cream median band.

Female Bordered Patch lay eggs in clusters on the food plant, which includes sunflowers, ragweeds, bursages, and other plants. The caterpillars live gregariously and can do a lot of damage to the food plants.

Bordered Patch are avid flower visitors and, as mentioned, will also take advantage of mud. The only month without records of this butterfly is December. They are most numerous in the fall but are possible at any time. They can be found in backyards or in more natural settings, from the desert floor to high in the Sky Island ranges.



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If you would like to see a Bordered Patch you may not need to look very far to see one!

Moth in the Spotlight

While many tiger moths are brightly colored, others are clad in earth tones and are not as striking. These moths are often white, brown, or gray in color. Some have red, orange, or yellow highlights. An example of such a tiger moth has been a regular attendee at my lights in recent weeks, Mousey Pygarctia (*Pygarctia murina*), at least that is how it is named in Seabrooke Leckie's *Moths of Western North America*. I do not know if she coined the name.



Both the common and scientific names refer to the mostly dark gray coloration of the adult. The back of the head and the posterior margin of the thorax are red. The abdomen is also red, with black spots on top of most segments. Adults measure about $\frac{3}{4}$ of an inch long.

While Leckie's field guide states that they are uncommon, they appear in good numbers at my lights in August and September. By that I mean that several appear each night the lights are on.

Mousey Pygarctia caterpillars feed on a variety of plants, including spurge,

caltrop, twinevine, and others. Some of these plants are chemically protected



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and the larvae are likely as well. The caterpillars are gray with a yellow lateral stripe, and tufts of orange setae ('hairs').

It is interesting that a close relative, Rose-headed Pygarcia (*P. roseicapitis*), is virtually identical except that the gray of Mousey Pygarcia is replaced with white. Both can often be found together in the same habitats at the same time of year.

Last night I had several turn up at my lights. Turn yours on and see if you get some, too!

Dragonflies – Insects Worthy of a Festival

September means it is time once again for the Santa Cruz Dragonfly Festival. This month-long event celebrates dragonflies and damselflies, remarkable insects that are sometimes called the birder's insects. It is also a celebration of the revitalization of the Santa Cruz River, as habitat has been restored thanks to the outflow of effluent water from state of the art treatment facilities. In honor of this event, I am taking some time to talk about dragonflies and damselflies.



Dragons and damsels are classified in the order Odonata which is derived from the Greek word for 'tooth,' a reference to the large mandibles that the larvae and adults possess. There are currently 6,442 species according to the World Dragonfly List. Those species are divided into 2 suborders, Zygoptera (damselflies) and Anisoptera (dragonflies).

Some authorities recognize a third suborder, Anisozygoptera, with 3 species in Asia that are somewhat intermediate between the other 2. Others recognize this group as part of the Anisoptera.

Damselflies are slim and rest with the wings folded alongside or above the abdomen in most. The eyes are widely separated on the head. Dragonflies



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are more robust, rest with the wings spread to the side of the body, and the eyes are either touching or are separated by less than the diameter of the eye.

In practice, dragonflies are unlikely to be confused with other insects. Damselflies somewhat resemble antlions of the order Neuroptera but lack the conspicuous antennae that group. Indeed, the antennae of all odonates are small and easy to overlook.



Odonates are tied to water as that is where the larvae, also known as nymphs or naiads, develop. Most freshwater bodies provide habitat for larval odonates, from swift-flowing rivers and small streams to large lakes, ponds, rainpools, and phytotelmata (water filled cavities in terrestrial plants). A handful of species can develop in brackish or even salt water. Key attributes of larval habitat include water temperature, bottom substrate (mud, sand, bedrock),

amount and type of aquatic vegetation, presence of bottom detritus, and presence or absence of fish.

Larvae feed on a wide range of prey, including insects and their larvae (including other odonates), crustaceans, worms, and even small vertebrates like fish and tadpoles. In fishless habitats, larval odonates often occupy the top of the food chain.

Food is detected by vision in adult and larvae. Each compound eye is comprised of thousands of individual eyes, called ommatidia, which provide them with some of the finest visual acuity in the insect world. Once prey is within range, the larvae shoots out a hinged structure called the labium at remarkable speed. The tip of the labium is adorned with 'teeth,' that snare the prey, which is then brought to the mouth to be consumed.

As in other insects, the larva molts the exoskeleton to allow for further growth. Most odonates molt 10 – 15 times during their development. The



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time required for the larval stage of the life cycle ranges widely, from as little as 20 days in some tropical damselflies to as long as 8 years in high latitude species. Once larval development is complete, the larvae leaves the water, climbing out onto nearby vegetation, rocks, or similar substrate and molts one last time. The body swells causing a seam on top of the thorax to split. From this opening, the dragon or damsel extracts itself from the larval exoskeleton. This is left behind and is called an exuvia (plural: exuviae), which are often be found in shoreline vegetation.



Desert Firetail pair laying eggs

The now adult odonate pumps hemolymph, the insect equivalent to blood, into the wings, expanding them. The new exoskeleton hardens and the insect takes its maiden flight, which is usually clumsy and short in distance. Within a couple of days, however, the adult becomes the rulers of the skies. I like to tell kids that odonates start off as fish but grow up to become birds.

Once adulthood is reached, the dragon or damsel's main job is to find a mate. Males are usually found near water, awaiting females, which typically stay away from water until they are ready to lay eggs. Courtship,

while it does occur in some species, is not a strength of odonates. Females are typically grabbed by the nearest male upon arriving at a water body. They are grasped by the front of the thorax in damselflies and by the head in dragonflies.

In a quirk of evolution, odonates are unique in the animal kingdom in 1 key aspect of reproduction. Sperm is produced in the testes (that is not the unique part) which are located on segment 9 of the 10-segmented abdomen. But females get sperm from the secondary genitalia on the underside of



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segment 2. There are no internal ducts or tubes connecting segment 9 to segment 2. The male must, therefore, curl his abdomen forward and deposit sperm into the secondary genitalia before actually mating.

With sperm in segment 2 and a female grasped, the female then curls her abdomen forward and obtains the male's sperm. This is called the wheel position and in damselflies is often heart-shaped. Mating can last anywhere from a few seconds to several hours, depending on species. In those with lengthy mating sessions, most of that time is occupied by the male using small hooks and teeth of his secondary genitalia to remove any sperm left in the female from previous matings.



Malachite Darner
Gabriel Gomes

Eggs are fertilized as they are being laid. Most dragonflies lay eggs directly into the water. Damselflies and darners (a family of dragons) possess ovipositors and lay eggs in plants. In many species, males ensure their paternity by guarding females as they lay eggs. They can be in physical contact with their mates (contact guarding) or hang around close by (hover guarding). In some the females lay their eggs alone with not mate guarding.

Like many other forms of wildlife, Arizona is an excellent state for odophiles, with 63 damselfly and 86 dragonfly species. Some are found on rivers, streams, and creeks.

Others are found at ponds or lakes. The habitat preferences of the adults largely reflect the habitat preferences of the larvae. It also facilitates species identification. Pond species are not likely to be seen at rivers and vice versa.



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Another clue to identification is behavior. Is the insect in flight continuously or does it perch frequently? When perched, does it do so by hanging vertically, or is it in a horizontal or oblique posture? Does it perch on the ground or in vegetation?



Canyon Rubyspot
David Smith

There are some obvious physical characteristics, such as color, that are critical to dragonfly and damselfly identification. But where are the colors found on the body? If there is color and patterning in the wings, there is a good chance it is a member of the skimmer family. Does the end of the abdomen thicken to form a 'club?' If so, it is likely a clubtail. In damselflies, do the wings show color, either at the wing bases or throughout the wings? If so, then it is probably a jewelwing.

In that past couple of decades, outstanding field guides have been published, helping to bring odonates to a much broader audience. Community science platforms like iNaturalist and Odonata Central have also helped. In short, it is a great time to observe these fascinating insects.

Head to the nearest pond or stream any look for damselflies and dragonflies. They will likely be present. Better yet, attend a dragonfly walk or festival near you. There are more than you make think!



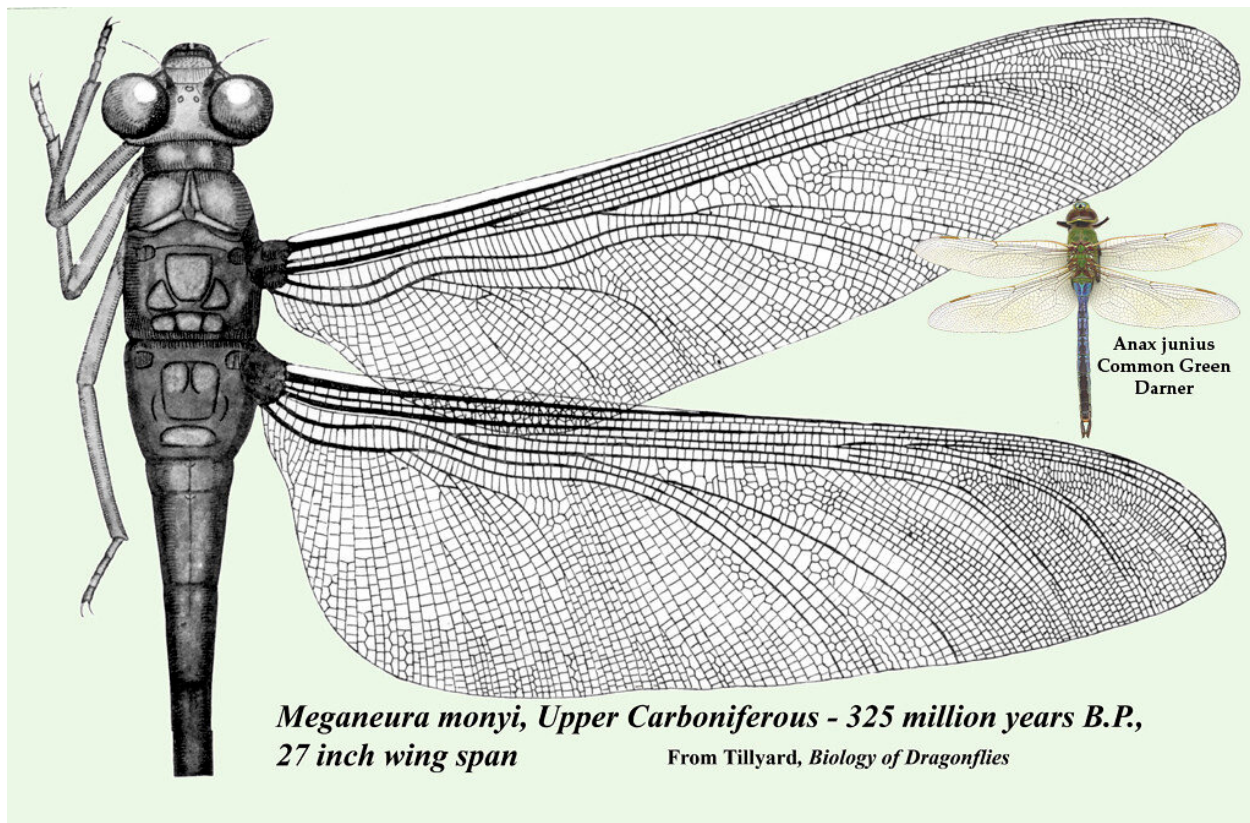
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Did you know?

... that ancient relatives of dragonflies are among the largest insects to ever inhabit the Earth? The now-extinct order Meganisoptera (formerly called Prodonata) lived from the late Carboniferous to the Late Permian (324 – 260 million years ago). Based on fossil discoveries, the largest of these so called griffinflies, *Meganeuropsis permiana*, had a wingspan of 28 inches! Another, *Meganeura monyi*, was only slightly smaller. One of the factors driving the evolution of these giants is that Earth's atmosphere had a much higher oxygen content than that of today, making it easier for oxygen to reach all the cells of really big insects. There were also fewer aerial predators at this time.

Meganisoptera is not a direct ancestor to today's dragonflies. Instead, it was a side branch of the Odonata tree of life that went extinct a long time ago.

But how cool would it be to go back in time and see them?



A comparison between one of the larger griffinflies and a modern Common Green Darner.



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