



Jeff Babson
Jeff@SkyIslandTours.com
www.SkyIslandTours.com
520-488-8551

The Sky Island News



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“Whether measured by abundance, biomass, or numbers of species, moths are one of the most successful branches on the tree of life.”

David Wagner

It is July and that means it's time for a big event! Yes, National Moth Week is here - a time to celebrate moths and other forms of nocturnal biological diversity. This month's issue is moth-centric but there are other things inside. You will see several moth related events on the calendar this month. There are moth nights around the country (and world), so visit the event's website for information on all of the events scheduled in support of NMW.

The theme for this year is art, so take photos, make a sketch, or paint some moths. They are certainly worthwhile subjects!

I hope you like this month's issue!



Jeff Babson
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www.SkyIslandTours.com
520-488-8551

July Field Trips

Madera Canyon Birding. Wednesday, July 8. 7:00 – 11AM. Cost is \$10/person. Email (jeff@skyislandtours.com) to register. **LIMIT 15 PARTICIPANTS.**

Warblers top the list for this outing, as Red-faced, Grace's, Virginia's, and Olive are possible, as is Painted Redstart. We may even get a Coppery-tailed Trogon! We will meet in the Safeway parking lot at I-19 and Continental Road and carpool to the site. All vehicles will need a Coronado National Forest annual pass, an America the Beautiful Interagency Pass, or a day pass.

Madera Canyon Mothing. Wednesday, July 22. 7:30-10:00PM. Cost is \$10/person. Email (jeff@skyislandtours.com) to register. **LIMIT 15 PARTICIPANTS. Weather Permitting.**



Western Polyphemus Moth

As part of the National Moth Week festivities, we will set up a light sheet at the Upper Picnic Area at the Carrie Nation trailhead to see what comes in. There should be a lot of cool moths and other insects. It will be a blast! We will meet at the parking lot of the Carrie Nation trailhead by the first restrooms. Bring

water, snacks, and a flashlight. It can be cool, especially if it has rained, so bring a light jacket. Feel free to bring a camping chair if you wish.

Mt. Lemmon Mothing. Friday, July 24. 7:30-10:00PM. Cost is \$10/person. Email (jeff@skyislandtours.com) to register. **LIMIT 15 PARTICIPANTS.**

To further celebrate National Moth week, we visit Middle Bear picnic area on Mt. Lemmon to explore nighttime nature. A blacklight sheet will be set up to see what moths, beetles, and other gems we can lure in. Among our



Jeff Babson
Jeff@SkyIslandTours.com
www.SkyIslandTours.com
520-488-8551

targets will be silk moths, hawkmoths, and tiger moths. There is a good chance that there will be some cool beetles, too. Bring water, snacks, and a flashlight. It can be cool, especially if it has rained, so bring a light jacket. Feel free to bring a camping chair if you desire. We will meet at the picnic area.

July Classes

Flowering Plants Part 1. Friday, July 10. 10AM-12PM. Virtual Class Via Zoom. Tucson Botanical Gardens. To register, use this link <https://tucsonbotanical.org/class-schedule/>. Part of TBG's Botanical Master class.



Flowering plants are the crown of plant Earth. They are so diverse that they require 2 classes to just begin the conversation about them! This class introduces flowering plants, also called angiosperms, discussing features that unite them and begin our survey of flowering plant families known as monocots.

Tiger Moths. Friday, July 24. 10AM-12PM. Las Campanas (565 W. Belltower Dr., in Green Valley). To register, call 648-7669 or visit <https://www.gvrec.org>.

Tiger Moths include some of the most beautiful moths out there. In addition to the beauty of many, tiger moths are fascinating insects well worth our time. They can manufacture their own toxins as caterpillars and can even self-medicate themselves against pathogens and parasites. Some can be seen on flowers during the day; others can be attracted to lights at night. We celebrate National Moth Week with an examination of these rock stars of the moth world.



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Pima County Presentations

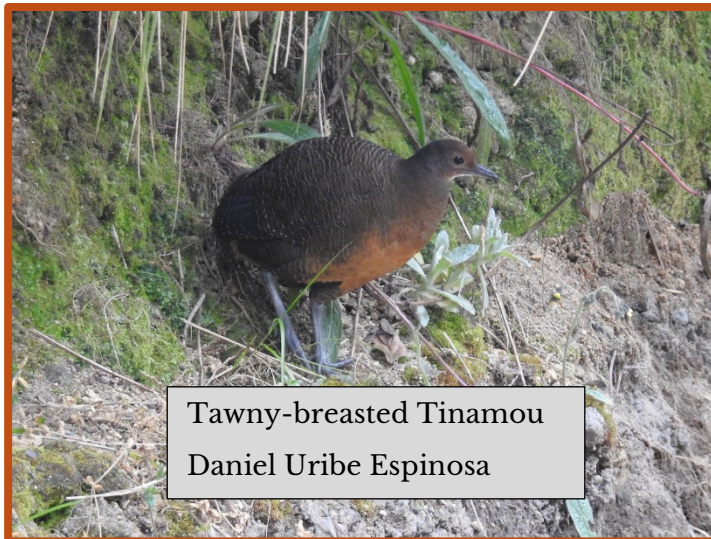
These online programs are free but you must register in order to receive the Zoom link to the presentation. The programs are recorded and all who have registered will receive the link to the recording. If you have questions or need assistance, contact us at: eeducation@pima.gov.

Visit our Eventbrite page at <https://bit.ly/Nature-Online-Tickets> to register. Once registered you will receive a link to the Zoom presentation.

The World of Mammals: Mammals of the Sonoran Desert Conservation Plan. Wednesday, July 1. 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.

Seven mammal species are protected under the Sonoran Desert Conservation Plan. This month we look at these threatened creatures, including the challenges they face and the outlook for their future.

Adventures in Birding: Tinamous. Tuesday, July 7. 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.



Tawny-breasted Tinamou
Daniel Uribe Espinosa

Ranging from Mexico through most of South America, tinamous look like quail but are close relatives of ostriches. This month we explore these elusive birds of the American tropics.

Order Up! Inchworm Moths. Monday, July 20. 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.

Turn your patio lights on and you will almost certainly be visited by inchworm moths. They are often cryptic in color and pattern but beautiful



Jeff Babson
Jeff@SkyIslandTours.com
www.SkyIslandTours.com
520-488-8551

in detail. This month we celebrate National Moth Week with an exploration of the exceptionally diverse inchworm moths!

Lifestyles of the Smooth and Scaly: Hibernation, Brumation, Estivation, and Torpor. Tuesday, July 28. 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.

Biologists use a variety of words to describe dormancy in animals. But what is the meaning and difference of all of them? This month we try to add some clarity and understanding to these terms.

Magnificent Moth Muncher

It is no surprise that bats are common predators of moths, at least adult moths. They are both active at night and are found in the same airspace. Bats use high frequency vocalizations to navigate the night skies, avoiding obstacles and detecting prey. Calls for insect-eating bats are usually within the range of 20 – 60 kHz. Most people's hearing tops out at around 20kHz, so most of these sounds are undetectable for us without assistance from special devices. However, a remarkable bat not only finds food using echolocation calls but does it so using frequencies that people (at least some of us) can hear.

Spotted Bats (*Euderma maculatum*) are jet black with white around the ears and large white spots on the rump and each shoulder. They have big pink ears that are almost as long as the forearm. The body is about 2.5 inches long, with a wingspan of 14 inches. They weigh only 0.65 ounces. If one is lucky enough to see a Spotted Bat there should be no question about which species it is because they are unique in appearance!



Jeff Babson
Jeff@SkyIslandTours.com
www.SkyIslandTours.com
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These bats can be found in a wide variety of habitats – woodlands, deserts, marshes, canyons. The key requirements are suitable roosting sites (rocky



crevices) and access to productive foraging areas.

Spotted Bats range from north-central Mexico to southern British Columbia and Montana and from California east to New Mexico and west Texas.

Long thought to be quite rare, it appears that Spotted Bats, while uncommon, are

more numerous than previously thought. Most records are from scattered sites throughout their broad geographic range. During Bat Walks that I do for Pima County we occasionally detect Spotted Bats but they are unquestionably one of the rarest bats on these surveys.

Female Spotted Bats give birth to 1 pup per year in June or early July. The pups do not have the spotted appearance of the adult when born. They are capable of flight 4 to 6 weeks after their birth.

The main items in the diet of Spotted Bats are moths, with members of the inchworm (Geometridae), tent caterpillar (Lasiocampidae), and owlet (Noctuidae) moth families favorite menu items. Many of these moth have hearing organs called tympana that are tuned to the frequencies of bat echolocation calls. Moths with such equipment can hear the bats coming and take evasive action.

Spotted Bats are able to get around the defenses of these moths by echolocating at *lower* frequencies than most bats, frequencies below the range of moth hearing. Call pulses begin at 12 – 14kHz and sweep down to 6 – 7 kHz. Their calls are clearly audible to humans, but not their prey. Ingenious!



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Spotted Bats certainly rank as one of North America's most spectacular mammals. It is uniquely patterned and behaviorally remarkable. I suspect that if you ever see one, it will be a memory that lasts a lifetime.

Any sighting (or even detecting their calls) is a treasured thing. I hope you find this furry treasure at some point!

What's in a Name – Kinglets

Kinglets are among the smallest of North America's birds, measuring only about 4 inches from the tip of the bill to the tip of the tail. Hyperactive by nature, kinglets are insectivores that glean, hover, and sally to capture their food. There are 2 genera and 6 species of kinglet in the Regulidae, found mostly in coniferous forests of the Northern Hemisphere, at least during the breeding season. In winter they feed heavily on the eggs, larvae, and pupae of insects, including moths. Adult insects are consumed sporadically in winter but heavily at other seasons.



Ruby-crowned Kinglet
Peter Jacyk

Ruby-crowned Kinglet (*Corthylio calendula*) is the most widespread of North America's 2 kinglets. It breeds in the boreal forest from Alaska to Newfoundland, south in the Rockies to Arizona and New Mexico. They are frequent winter residents in southern Arizona.

The genus name comes from Greek, meaning 'a small wren-like bird.' An apt description! The species name means 'glowing,' a reference to the fiery red crest that is erected when the bird is agitated. Linnaeus described the species in 1766 from birds collected in Philadelphia, Pennsylvania. It was formerly placed in *Regulus* with the remaining kinglets but was moved into its own



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Jeff@SkyIslandTours.com
www.SkyIslandTours.com
520-488-8551

monotypic genus in 2021 when genetic data indicated Ruby-crowned Kinglet is deeply divergent from other kinglets.



The other kinglet in North America is Golden-crowned (*R. satrapa*), a bird that has been expanding its range southward from the boreal spruce-fir forest in recent decades. The genus name is Latin for 'little king.' The species name 'a

ruler.' Both names are allusions to the colorful head feathers, reminiscent of a crown. This feathered gem was described in 1823 by German doctor, botanist, and zoologist Hinrich Lichtenstein.

Both of these kinglets can be found in southern Arizona – Golden-crowned is a permanent resident of montane coniferous forests, Ruby-crowned is a winter visitor in much of the region.

May use see on these whirling dervishes sometime soon!

Threadsnakes – Serpents Disguised as Worms

A couple of weeks I had a pleasant surprise upon returning home from a bat walk. As I prepared to enter my home, I saw something trying to move on the concrete sidewalk that led to the front door. It seemed to be struggling to get anywhere. Having seen this creature before I knew immediately what it was. It was a Western Threadsnake (*Rena humilis*), a decidedly unsnake-like snake.



Jeff Babson
Jeff@SkyIslandTours.com
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These are small reptiles with a maximum length of 16 inches, though the biggest one that I have seen was only about a foot in length. The one I referred to in the previous paragraph was only about 6 inches. They are pink with a silvery gloss. The eye are present as black spots and are

covered by a scale. Both ends are bluntly rounded with the tail ending in a small spine.

Another species, New Mexico Threadsnake (*R. dissecta*) also occurs in Arizona but is mostly found in Cochise County, barely entering eastern Santa Cruz County, with a disjunct population in Graham County. Western Threadsnake is found throughout much of southern and central Arizona and along the Colorado River to the Grand Canyon. In addition to geography, the two can be separated by the presence or absence of scales above the eyes (supraocular scales) – New Mexico Threadsnake has them, Western does not. In practical terms, this means there are 3 scales between the eyes on New Mexico, only 1 on Western. To see this detail, either in hand inspection or a good macrophotograph is necessary.

Threadsnakes spend most of their lived underground. They feed mostly on the eggs, larvae, pupae, and (less frequently)) adults of ants and termites. They will also consume other soft-bodied insect prey, such as beetle grubs. Their world is mostly one of chemical and tactile signals. They can detect the scent of ant and termite trails and follow it back to the nest.

Unlike in most snakes, the belly scales are the same size as scales elsewhere on the body, meaning they do not move efficiently on the surface because their ventral scales do not gain traction on the substrate as other snakes do.

A fascinating aspect of the natural history of these animals is that small owls, like Elf Owls and screech-owls, will capture these snakes and bring



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Jeff@SkyIslandTours.com
www.SkyIslandTours.com
520-488-8551

them back to their nest. But they don't eat them, at least not right away. They release them in the nest where the snakes are believed to feed on invertebrates in the nest, including parasites like botflies.

Threadsnakes are lay clutches of 2 – 8 eggs in July and August. Females often tend the eggs and sometimes multiple females can be found guarding their collective clutches.

North America's 3 native species of threadsnake (the third is found in Texas) are in the Leptotyphlopidae, a family that includes 13 genera and 144 species, ranging from the New World to Africa, the Arabian Peninsula, and southwest Asia. There are 2 other families of threadsnakes, also called blindsnakes or wormsnakes that are not native to North America. Collectively, they are the most primitive (= basal) of extant snakes.

Threadsnakes can sometimes be seen above ground but they are more frequently observed under rocks, logs, and other surface debris. The next time you are doing some yard work, pay close attention. You may observe one of these remarkable reptiles!

Butterfly Profile: Moth-like Butterflies

The general perception of butterflies is one of brightly colored diurnal creatures that stop at flowers to imbibe nectar. While that certainly holds true for many, other butterflies do not fit that picture. Some butterflies could be described as drab, for example, while others completely ignore flowers. But one group really bucks the trend.

The world's butterflies, about 20,000 species, are divided into 7 families by entomologists. All but one of these families can be found in the US and Canada. The exception is the family that is, in many respects, very un-butterfly-like. This is the Hedyllidae, collectively called the moth-like butterflies, a name that is confusing and lacks imagination. The name does point out the confusing characters of this group. For example, they have antennae that are filiform (thread-like) or bipectinate (feathery) like moths. They also have a wing coupling mechanism found in moths. But DNA evidence firmly places them with butterflies.

The family includes 39 species in 1 genus (*Macrosoma*), although some lepidopterists believe that 3 genera should be recognized. They range from central Mexico to Brazil and Peru. Their closest relatives are the skippers



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Jeff@SkyIslandTours.com
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520-488-8551

(Hesperiidae), a large family of butterflies that include some species that some may call drab and unattractive (I don't!). Most species are forest dwellers.



Macrosoma albimacula
Estefania Solis

Hedylids are clad in earth tones, often with dark striations on the wings and contrasting spots. The sexes are alike in pattern, but females are larger and paler than males in some species.

Structurally, moth-like butterflies have narrow bodies and broad wings, a shape that is very similar to that of inchworm moths (Geometridae).

Partly due to the overwhelming diversity of tropical insects and partly (I suspect) their lack of bright colors, the biology of most hedylids is unknown. There is certainly much to be discovered about these butterflies.

Another very mothy trait is that these butterflies are nocturnal

and are attracted to lights. Surprise! Butterflies attracted to lights at night!

Moth-like butterflies are another example that, in Nature, things aren't always what they seem. Though none of these creatures are found in the US or Canada, perhaps you will see them around lights at the lodge on your next journey to the tropics.

Moth in the Spotlight

Inchworm moths are the second largest family of moths with over 24,000 species described and many more awaiting description. Most feed as caterpillars on non-toxic plants, so adults and larvae are often cryptic (but not always!) in appearance. Cryptic does not mean unattractive, however. One example is Many-lined Wave (*Arcobara multilineata*).



Jeff Babson
Jeff@SkyIslandTours.com
www.SkyIslandTours.com
520-488-8551



The wings are white but are crossed by many fine brown, gray, and black lines. The forewings are pointed at the apex. The hindwings have a point on the outer margin. The overall effect, to my eyes, is one of fine-grained, light wood.

The flight season of adults in Arizona is lengthy, spanning from February to October. The US range is confined to southern and central Arizona and west and south Texas.

As is the case with a surprisingly large number of North American moth species, the larval food plant(s) are unknown. While not a common moth, Many-lined Wave is not rare either. The fact that what the caterpillars eat remains a mystery is likely attributed to their (likely) amazing camouflage, as geometer caterpillars are remarkably well hidden.

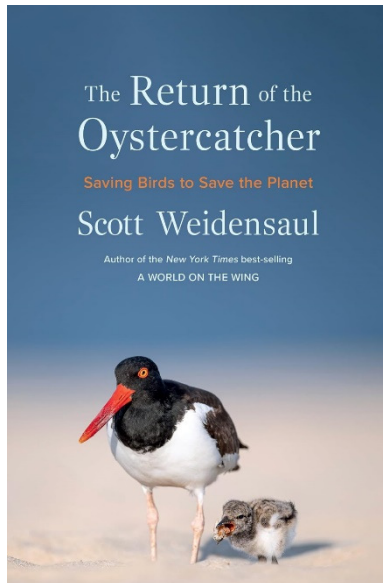
Book Review *The Return of the Oystercatcher*. Scott Weidensaul. 356 pages. Norton. 2026.

It is no secret that the natural world is facing numerous challenges. All of the bad news can lead one to despair and that things are hopeless. I certainly understand that sentiment. But there are positive things happening around the world in terms of conservation, performed by dedicated, passionate



Jeff Babson
Jeff@SkyIslandTours.com
www.SkyIslandTours.com
520-488-8551

people trying to save the planet's biodiversity. Scott Weidensaul's new book shines the light on such stories.



In this wonderful new release, the author takes us around the world to look at the often heroic efforts people are making on behalf of birds that are in trouble. From Hawk Mountain in Pennsylvania, where annual raptor counts are helping monitor hawks, eagles, and falcons, to Eastern Egg Rock off the coast of Maine, where the work of Steve Kress and his colleagues has brought nesting Atlantic Puffins back to a former colony. We travel to the UK where a husband and wife have resurrected a failing farm into productive wildlife habitat, providing important habitat for many birds. We travel to the Danube Delta where one of Europe's most productive wetlands is thriving in the shadow

of the war in Ukraine. We visit Cape Cod, Hawaii, Colorado, Idaho, Romania, the Northwest Territories, and other locales where bird conservation has had successes. It is refreshing to see that some people who would not normally be considered to be allies of birds become advocates for their conservation.

Weidensaul is one of the best nature writers around and this book shows his talents for storytelling. Each of the places he visits still has challenges to overcome and Weidensaul does not gloss over this reality. But he talks about the struggles while also highlighting the successes of each effort. The author does a masterful job of showing that each of the projects he profiles, while obviously about birds, it is also a story about the people working so hard to save them. It is comforting to know that such people are out there, kindred spirits in their love of birds.

Weidensaul has written many excellent books – *Birds of a Feather*, *Living on the Wind*, and *The World on the Wing*, among others. *The Return of the Oystercatcher* continues his literary excellence. I highly recommend it (and his other offerings, too).

New Species Report

Tiger moths are among the most spectacular of all moths, often brightly colored and beautifully patterned. Many tiger moths are hard to miss for



Jeff Babson
Jeff@SkyIslandTours.com
www.SkyIslandTours.com
520-488-8551

these reasons. Thus it was something of a surprise when a new colorful tiger moth was recently discovered in India. The new moth was distinctive enough to require a new genus, too.



Antaram idukki is pastel orange with gray markings, termed fasciae, outlined in black that form a wave-like pattern on the forewings. The hindwings are similar in color but the fasciae are reduced to spots. The species was named for the Idukki district in Kerala, the state in southern India where the species was found in the Western Ghat mountains. The authors of the paper describing the species suggest it is very rare, as only a single individual was collected during 2 years of continuous sampling.

It is generally frowned upon to describe a new species based on a single individual. Taxonomists prefer a series of specimens for a species description as it enables individual variation to be better appreciated. However, in cases where the new species is so distinctive a single specimen can be used for the description, as is the case with the new moth.



Jeff Babson
Jeff@SkyIslandTours.com
www.SkyIslandTours.com
520-488-8551

Nothing is known about this new insect. We don't know what females look like (a male is the only known individual), what the caterpillar looks like and feeds on, the extent of the flight season of adults, details of the life cycle, or the geographic range. In short, we know it exists but that is it.

Hopefully, further sampling over a wider geographic area will start to reveal more about the biology of this beautiful moth. The Western Ghats are a biodiversity hotspot and it would be expected that more tiger moths (not to mention moths in other families) will be discovered.

A beautiful addition to the long list of charismatic tiger moths!

Did you know?

... that an arctic moth's life cycle may take up to 11 years to complete? *Gnaephora rossii* is the most cold-hardy moth in the world, found on high Arctic islands where very few other insects occur. It ranges south at high elevations in the Rockies to Colorado and Wyoming. Males are diurnal and fly in search of females which, though winged, are essentially flightless. The caterpillars are generalists, feeding on a variety of plants. The long life cycle is largely due to the very short growing season in the high Arctic.

Another example of no niche goes unoccupied!