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Back Cover: Broad-billed Hummingbird, *Cynanthus latirostris magicus, Hillsboro*

How We Relate: To the Yucca and Agave

In past issues we have explored that interface between humanity and the rest of nature, how we perceive the rest of the natural world. Not in the sense of how well our sensory systems function, but rather what we see in our mind's eye. Examples include Gordon Berman's photo essay in BRN 7-4, the video of Melody Sears' work - Pastel Paintings of the Southwest, and the video of Jim Laupan's work - Making Rattlesnakes. Seeing nature in "other ways" extends the bounds of our sensory systems and can enhance our appreciation of the natural world.

Here are a few examples of what Bob Shipley, formerly of Kingston, now of Albuquerque, saw when the rest of us saw bits of yucca and agave. Whimsical art to handcrafted utility, Bob excels in using yucca as a medium. He noted. "Even the finial of the lamp is yucca with all the pieces hand cut and sanded by hand. Dimmable strip LEDs provide the light."

Cooking tongs, a walking stick, and crutches - all pictured on the next page - emphasize the range of possibilities, as Bob Shipley sees yucca.

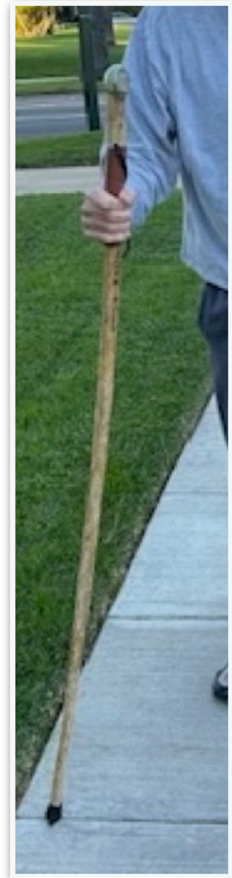
The crutches, in particular, presented technical as well as artistic challenges. Yucca is very strong in compression but lateral tension is something else. Yet the crutches require a

Snake by Bob Shipley of Albuquerque, formerly of Kingston.

significant bend above the handle to conform to human usage. Yucca, load bearing, and bends do not play well together. So note the joinery used in the crutches. The handles are attached as shown immediately to the right and in the bottom image. The change of load bearing angle is created by the ingenious joinery shown at the middle right. This joint transfers the load through the bend and to the ground - very effectively.

Bob demonstrated just how light, strong, and resilient the crutches are one weekend on a visit to our home in Hillsboro. How, you might ask? By having me hold them and be amazed at the lack of weight and use them (with my considerable weight). He then proceeded to throw them on the floor to demonstrate their durability.

Simply amazing, technically complex and well executed, and beautiful - in a natural way.



Editor's Note: The success we experienced in 2024 was due, primarily, to the efforts of James Von Loh of Las Cruces. His surveys of the Odonata in Doña Ana County and adjacent areas were truly extra-ordinary and bountiful. In this article we wrap up the 2024 season and start our review of the 2025 season.

Wrap-up of the 2024 *Odonata* Season and a Start of 2025

by James Von Loh

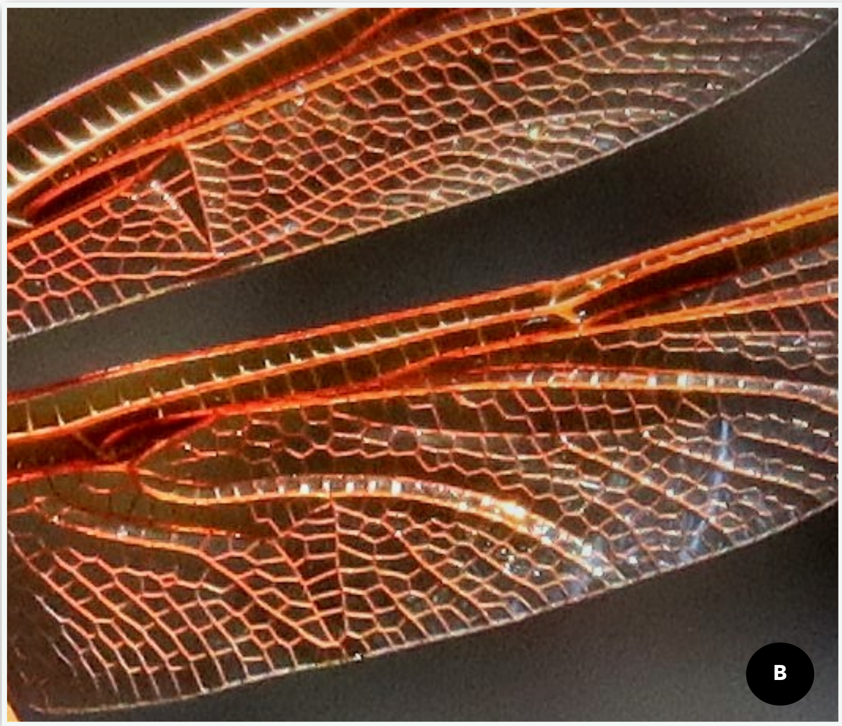
Flame Skimmer

Relative to prior years (2019-2023) few Flame Skimmers, *Libellula saturata*, Uhler, 1857, used habitats of the Organ Mountains during the 2024 season and they were nearly all males. One is presented below. The images were collected at the spring on the Soledad Canyon headwall which also supported two male Springwater Dancers.

A. **Male perched on and hunting small flying insects from a twig. He is characterized by the typical orange color and spot/patch distribution in this unique orientation to the sun angle. When viewing dragonfly wings in bright sunshine, we usually perceive them as smooth, even fragile. However, each wing cell and major veins are elevated and the areas below are recessed ('waffled'), as depicted here; this 'wing topography' affects color perception/texture depending on sun angle, light quality/intensity, and immersion in shade, among other attributes. 07/28/24**
B. **Detail of "A".**

Variegated Meadowhawk

The Variegated Meadowhawk, *Sympetrum corruptum*, Hagen, 1851, is abundant to common in most habitats of Doña Ana County. While we have described the species in detail in earlier issues of this Journal and in *A Natural History of The Odonata of Doña Ana County With Notes on the Black Range*,

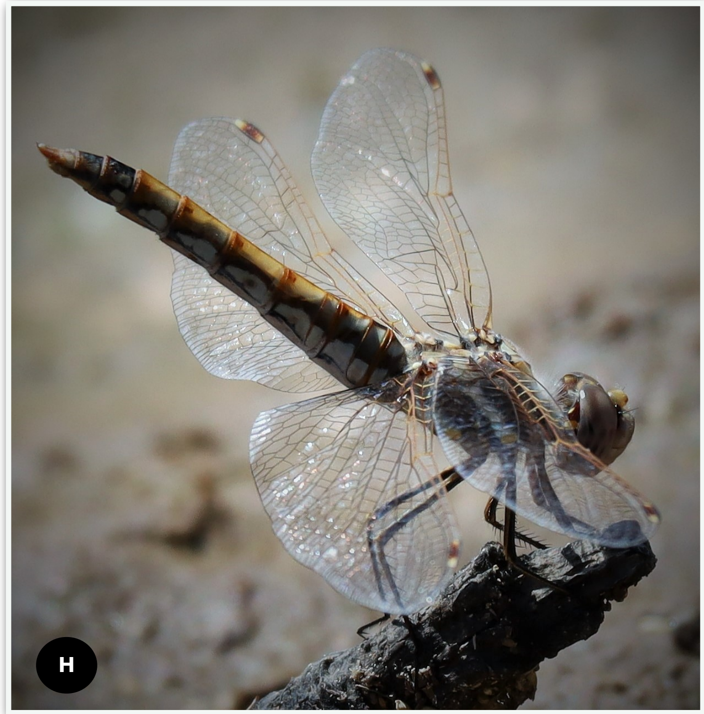


individual variations worthy of discussion sometimes are photo-documented, including the following individual perching on the bottom of Bar Canyon arroyo and hunting small flying insects on 8/18/24.

C. View of his head and thorax illustrates the face as light brown rimmed by white and yellow at the top, eyes are brown over lavender, the thorax is brown on the front with wide, white stripes. Immature male perches low on a twig in a shady area to hunt; his base color is white with orange-red stripes at the wing bases, on the abdomen dorsal midline, and around each abdomen segment joint; there are black dorsal markings on S-8 and S-9.
D. Individual obelisks while perching and projects his wings forward; the white and orange-red color pattern is muted somewhat while on his shaded perch.
E. This enlarged dorso-lateral view shows the broad white thorax stripes ending in a yellow spot, the coppery wing color, and the row of white spots along the abdomen bottom.

In Organ Mountains habitats during 2024 this was the most common species, although they were fewer in number and smaller in size than the 2021 through 2023 populations.

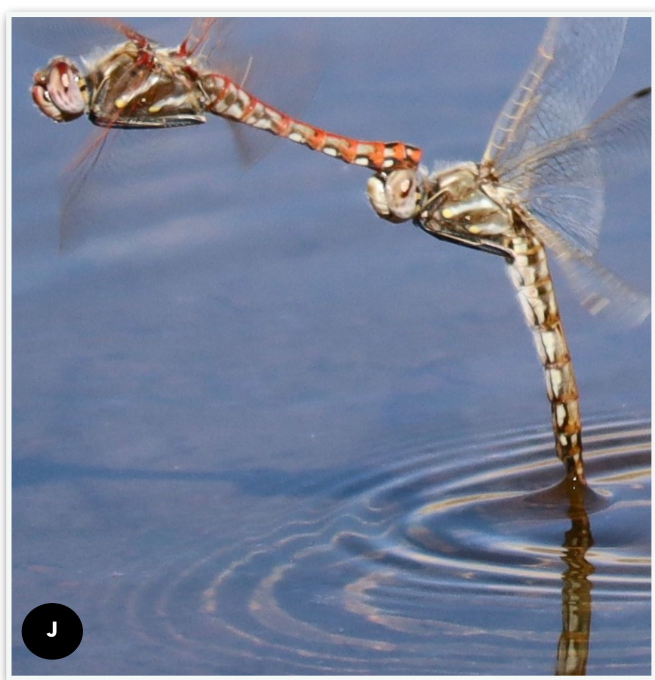
F. Male head, thorax, and basal abdomen enlargement collected at the Dripping Springs Visitor Center (DSVC) stormwater retention pond. His face is red rimmed with white, eye is brown on top and lavender with dark spots below, thorax is grayish-brown but the lateral stripes are abbreviated or non-existent showing only the yellow spot (possibly indicates this is an immature male), the basal abdomen is characterized by the orange-red dorsal line and rings. 07/25/24
G. Next Page. Mature female 'obelisks' while perching on a branch to hunt arthropods on/ over the moist mud across the drying pond bottom.



H. Note this female's brownish-tan eyes, brown abdomen with white lateral spots along the edge of S-3 to S-8, the sutures between segments with bright orange-brown lines, and the dorsal black spot on S-8 and S-9. 09/10/24

I. Mature male (note the more complete white thoracic stripes) flies around the pond to attract a mate and occasionally hovers to examine potential threats, in this case me sitting on a rock with my camera lens 1 meter from him. 08/30/24

J. Post-mating, the male (L) remains in tandem linkage with the female (R) and guides her to egg deposition sites across the pond. Here he rapidly lowers the female to the water surface where she 'taps' her abdomen into the water and releases one-to-many eggs (a single egg shines bright white against her abdomen near the water surface in this image). 08/30/24



Plateau Spreadwing

Plateau Spreadwings, *Lestes alacer* (Hagen, 1861), were an uncommon damselfly using habitats supported by runoff collection within the stormwater retention pond at the DSVC Organ Mountains site during 2024. Due to light, often scattered, monsoon season rainstorms filling only shallow water pools, there were fewer individuals than occurred when deeper water was ponded in 2021 through 2023 and Plateau Spreadwings were common to abundant.

K. Mature male (U) and immature female (L) in tandem linkage following mating; the male first flew to a dried Green Sprangletop stem as a site for egg deposition, however the female refused to deposit eggs on the stem. 07/07/24

L. He then flew her to an emergent Green Sprangletop leaf over water where she began to pierce the leaf with her ovipositor and deposit eggs into the resulting slits to anchor them. 07/07/24

Familiar Bluet

Familiar Bluets, *Enallagma civile* (Hagen, 1861), were the common damselfly using habitats supported by runoff collection within the stormwater retention pond at the DSVC Organ Mountains site during 2024. Due to light, often scattered, monsoon season rainstorms filling only shallow water pools, there were fewer individuals than occurred when deeper water was ponded in 2021 through 2023.

M. At the DSVC stormwater retention pond, this pair is linked in a mating wheel with male (U) and blue female (L) transferring his sperm to fertilize her eggs; male has perched on a Green Sprangletop leaf over water and later guided the female, in tandem linkage, to sites with saturated branches and floating detritus for egg deposition. 08/04/24

Western Pondhawk

N. Next Page. Female Western Pondhawk forages on an unknown damselfly species while perched on a Bulrush stem at the La Mancha Wetland Restoration site. 08/14/24

Plains Forktail

O. Female (heteromorph) Plains Forktail, *Ischnura damula* (Calvert, 1902), forages on unknown substance or prey while perched on a Bermuda Grass fruiting panicle at the La Mancha Wetland Restoration site. 08/09/24

Powdered Dancer

P. Next page. A male Powdered Dancer, *Argia moesta*, (Hagen, 1861) perches on a Tamarisk twig, attracted to the larva of the Northern Tamarisk Beetle, *Diorhabda carinulata* (Desbrochers, 1870). 18 September 2024

Q. A cropped image of “P”. This beetle was introduced as a biological pest control for the non-native Tamarisk or Salt Cedar. This image first appeared in The Black Range Naturalist in July 2025, part of a series of articles on Salt Cedar.

False Eyes and Tails

The “false eyes” which butterflies and moths often display on their wings are used as a predator defense mechanism, which is assumed to either scare predators into thinking they are facing a larger animal or, more commonly, redirect attacks to less vital parts of the butterfly's wings. The video at this link is of a Gray Hairstreak, Strymon melinus; it illustrates the redirect function very well. The video shows that this is not a static display: the “antenna” moves and the eyes flair. The image to the right was taken on 07 September 2025 in Warm Springs Wash, NE of Hillsboro. The butterfly was nectaring on Seepwillow.

There have been recent studies which substantiate the statements made above about the role of eyespots. A good basic discussion of this function is found in “The Role of eyespots as anti-predator mechanisms, principally demonstrated in the Lepidoptera”, Martin Stevens, Biological reviews of the Cambridge Philosophical Society, December 2005.

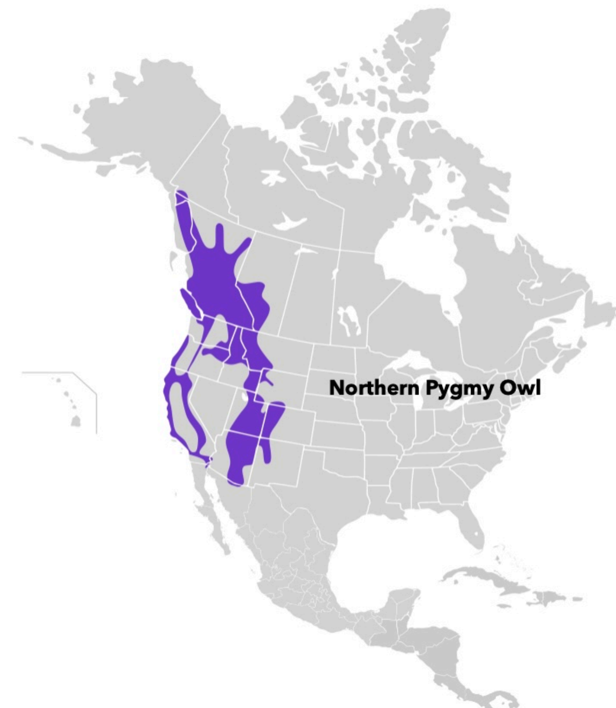
Updates and Tidbits

Mountain Pygmy Owl

As an update to the article in the January 2026 issue of this journal, about the species which visited a bird bath during 2025, we add this observation.

A Mountain Pygmy Owl, *Glaucidium gnoma*, visited a bird bath in Hillsboro on January 4 of this year, bringing the "yard list" for that yard to 178. It was also seen in the yard the day before. This species is diurnal.

The taxonomic designation of the population found here is disputed. The IOU (International Ornithologists' Union) considers this population a full species (see range map at the top of the next column by Simon Pierre Barrette via Wikipedia, shown here under a Creative Commons Attribution-Share Alike 4.0 International license). In this treatment, the population found here is the Mountain Pygmy Owl, *Glaucidium gnoma*. The Northern Pygmy Owl, *Glaucidium californicum,* range is shown in the second map from the top on the right under the same license, according to the IOU.



Various sources (The American Ornithological Society [AOS] and the Cornell Lab [All About Birds], for instance) do not recognize the Mountain Pygmy Owl as a full species. Instead, they consider this population to be a subspecies of the Northern Pygmy Owl, along with various other Pygmy Owls in Mexico and Central America.

At this level, the taxonomic determination of this population is pretty straightforward. It is in dispute. Lumpers consider it part of the Northern Pygmy Owl complex, splitters consider it a separate species (they also consider other populations in Mexico and Central America to be full species [e.g., the Guatemalan Pygmy Owl, *Glaucidium cobanense*]).

But let us not leave well enough alone. The IOU and AOS use some of the same English common and Latin binomials to describe the various (grouped or split) species populations. It can be very confusing.

For our part, we throw our weight (something less than that of a piece of down) behind the IOU, based on our personal observations of the various species.

On February 3, 2026, the same owl spent much of the middle of the day perched and hunting in the yard. That allowed for a series of photographs and video. Video of the owl may be viewed at this link.




Carolina Sphinx
Manduca sexta
(Linnaeus, 1763)
Hodges #7775

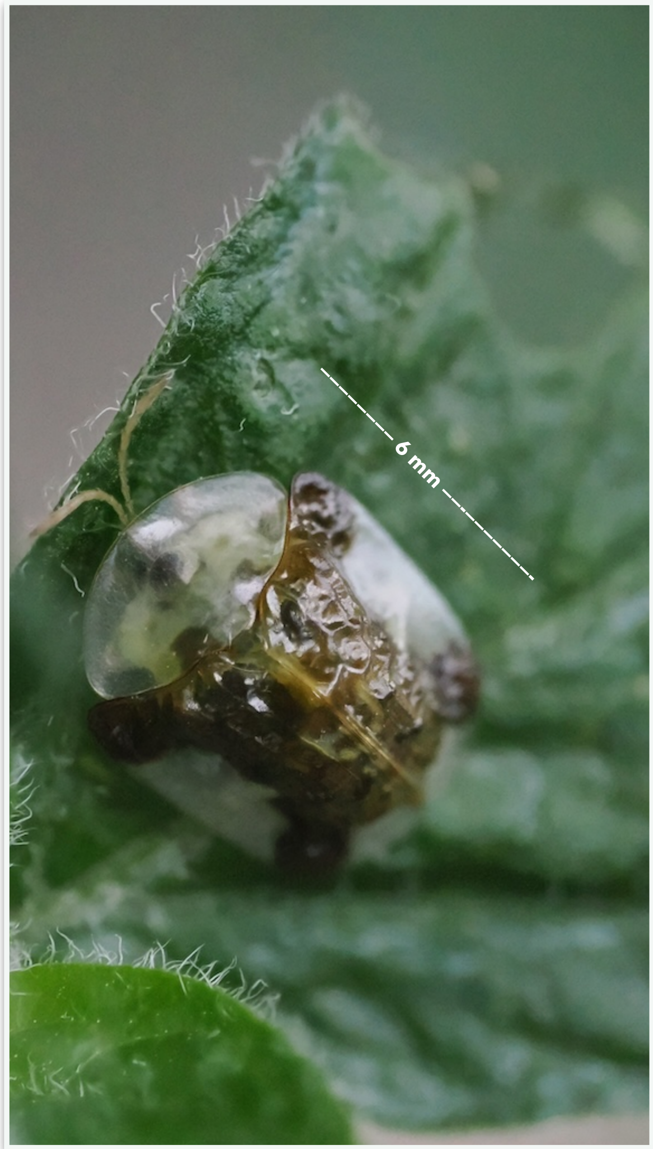
The individual shown above and in the right column was dying when first observed and was dead when photographed, on July 23, 2025, in Hillsboro.

This species is almost identical to *M. quinquemaculatus*, the Five-spotted Hawk Moth, but has six large orangish-yellow spots on its flanks instead of five. Both species are found in our area.

Clavate Tortoise Beetle
Helocassis clavata
(Fabricius 1798)

The body of the beetle shown on the next page was 6 mm long. It was found on a chili pepper leaf in Hillsboro on 15 August 2025. When first observed it looked like a dropping of some type. There were no legs or antennae visible. [Video may be viewed at this link.]

The larva of the species, shown at the upper left on the next page, was found on a leaf adjacent to the adult.


6 mm

Grasshopper Nymph

There are many people who are more knowledgable, and braver, than I. We are open to suggestions about the identification of this grasshopper nymph. The nymphs of grasshoppers go through five stages.

It was roughly ¾" long and was found on Burrobrush, *Ambrosia monogyra* ([Torrey & Gray ex Gray] Strother & Baldwin) in Warm Springs Wash northeast of Hillsboro on 07 September 2025.

In the course of trying to narrow the possibilities I came across the website of the Identification Technology Program, Grasshoppers of the Western United States, Nymph grasshopper key. I have the feeling that if I knew something this would be a very useful resource.

It is possible that this is an instar of *Aeoloplides turnbulli*, *Campylacantha olivacea*, *Hesperotettix viridis, or Melanoplus bowditchi.*

***Campylacantha olivacea*, Fuzzy Olive-green Grasshopper, is fond of *Ambrosia*. September is late for a nymph of this species.**

The folks at BugGuide have been willing to go as far as placing it in the *Melanoplinae*, Spur-throated Grasshoppers.

Beaver Ponds

In previous issues we have discussed the natural history of the North American Beaver, *Castor canadensis*, and myriad issues associated with their reintroduction and geographic spread (see BRN 7-2, for instance). Luwen Wan, Emily Fairfax, and Kate Maher ("Factors influencing surface water accumulation in beaver pond complexes across the Western United States", *Communications Earth & Environment* 6, 614 (2025). https://doi.org/10.1038/s43247-025-02573-x) "quantified the influencing factors that drive pond area and dam length variations using an explanatory modeling approach, after mapping surface water area of beaver ponds and creating beaver pond complexes . . . Our results provide an empirical foundation to inform site selection and prioritization for beaver restoration, supporting watershed management, climate resilience and ecological conservation strategies in regions with comparable data availability and landscape characteristics."

As noted in previous issues, the reintroduction of beaver populations in an area can be very controversial. The benefits of beaver dam building activity are well documented and understood, as are the detrimental effects of such programs ("detrimental" being almost universally defined by specific special interest groups).

Reintroduction programs can be as simple as finding a site, private or public, where the humans agree beavers should live. Or they can be a bit more comprehensive and long-term in perspective, focusing on the desired benefits (one of which is the reintroduction of beavers).

Maximizing other benefits (enhancing biodiversity and ecosystem functioning, creating wildfire refugia, mitigating habitat degradation, reducing the negative effects of high water events, and spreading pollutants over a broader area - among other things) requires a more thoughtful perspective.

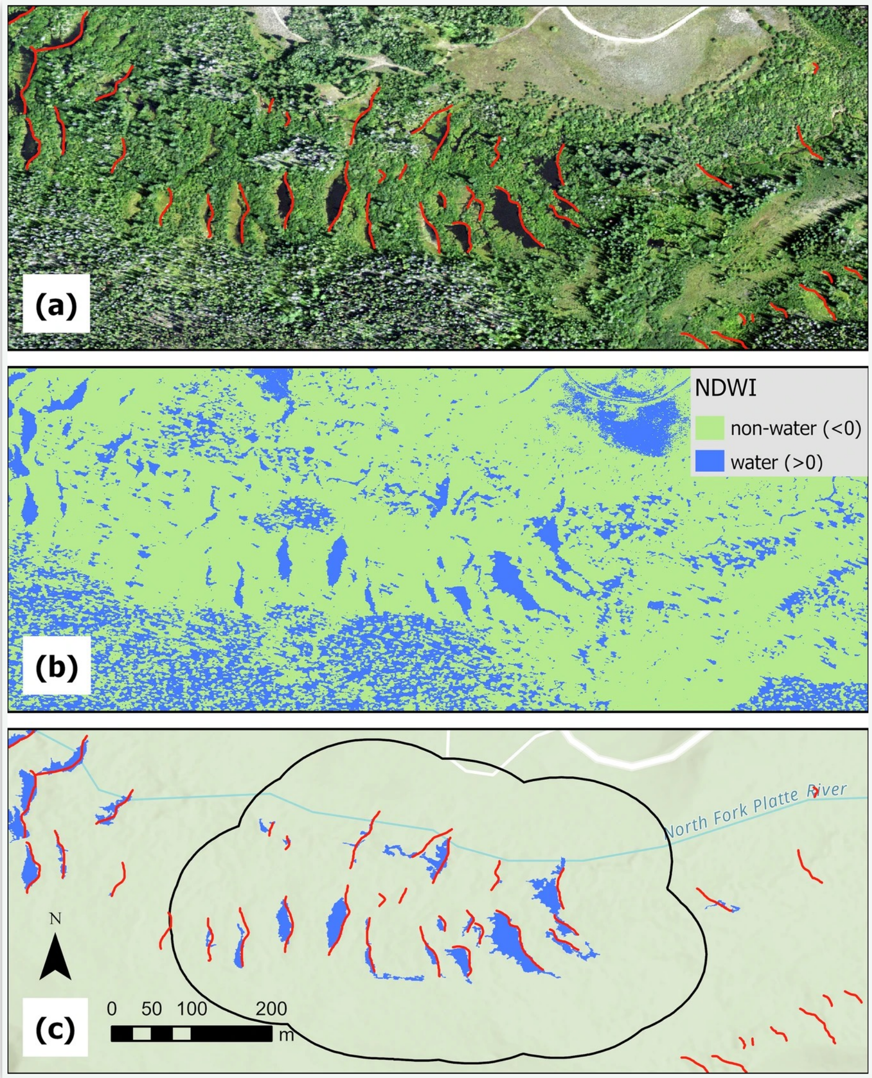
The authors' efforts are a major step in enabling "more thoughtful perspectives". Their use of "Remote sensing imagery (to) provide an efficient and scalable method for identifying beaver wetland complexes" was well conceived and executed (see right) but that was only the first step. Once the end product, beaver wetlands, was determined, the geographic and biological attributes of the area were assessed. Impoundment areas are determined by more than just dam length.

Such studies will enable the successful reintroduction of beaver populations across an array of assessment indices.

The Travel Habits of Cats and Dogs

Bottom Line: Cats and dogs do not travel across the landscape in the same manner. Canids tend to have established routes which they follow while felids are more free roaming. For those who are inclined to manage the resource this has some significant implications, since models which assume the same basic travel patterns for large mammals are incorrect.

These are the findings of William Fagan et al. in "Wild candids and felids differ in their reliance on reused travel routeways", *Proceedings of the National Academy of Science U.S.A.* 122 (40) e2401042122, September 29, 2025. https://doi.org/10.1073/pnas.2401042122. To quote the authors, "Such marked variation in the heterogeneity of species' space-use patterns is important because it provides a strong empirical contrast to long-standing assumptions of mathematical models of predator-prey dynamics and, more broadly, highlights key issues of space use that are relevant for the conservation and management of at-risk mammalian carnivores globally."



Images (above) and captions (below) from the study.
a. Manually identified beaver dams (red) overlaid on the NAIP mosaic.
b. Water and non-water masks created using an NDWI threshold of zero.
c. Beaver ponds (blue) generated by intersecting water polygons with mapped dams. The black outline represents a 100-meter buffer applied to a beaver pond cluster identified using the DBSCAN clustering algorithm, referred to as a beaver pond complex.

Diagram of analysis workflow building maps of probability ridges from GPS tracking data (A–D) and sample maps showing home ranges and probability ridges overlaid on landscapes (E–G). Panel A shows the original movement track data for cougar F70 (Puma concolor) from Utah, USA (54). Panel B shows the empirical semivariance (black) for F70's movement track, together with 95% confidence limits (gray shading) and the best-fit variogram (red) and its 95% confidence limits (pale red shading) corresponding to an anisotropic version of the OUF continuous-time stochastic process (SI Appendix, SI Detailed Methods). As in geostatistical analyses involving semivariances, large lags involve the fewest datapoints and have little influence on model fit. Panel C depicts the cougar's estimated home range distribution including its boundary (black curve) and corresponding 95% confidence limits (gray curves), probability density surface (red hashing), and SD of the AKDEc bandwidth kernels (white grid lines). Original movement trajectories are represented as black dots for clarity. Panel D identifies the calculated probability ridges that indicate routeways of repeated usage (red curves) overlaid on the home range distribution Note: Panels A, C, and D are mappable objects, but B is not. In Panels E-G, plots show mean home ranges (black contours), outer and inner 95% confidence bounds on the home ranges (gray and plum contours, respectively), and the location of probability ridges (red- and blue-colored curves) for individuals from six species in landscapes in which movements of both canids and felids were studied [Panels E: (55); F: (56); and G: (54)]. Backgrounds depict topographical relief and landcover type, ranging from arid (tan) to mesic (green) (Stadia Maps: https://stadiamaps.com/attribution/). Variograms, home ranges, and probability ridges were calculated via the R package ctmm as detailed under Materials and Methods. Cougar F70 appears in the Upper Right of panel G. Panels D–G show ridges calculated via the accurate but computationally inefficient ks algorithm (SI Appendix).

Above: Caption for the graphic at the top of the next page, from the study.

Figures 1 (right) and 4 (bottom right) are from the study and indicate that the distinction between the “travel habits” of the clades seems to be worldwide and common to the clade (feline or canine).

The authors note that “Drawing on a dataset of 1,239 carnivore GPS tracks, representing 16 canid and 18 felid species across six continents, we found that on average, canid home ranges feature substantially greater densities of reused travel routeways (quantified as probability ridges, Figs. 1 and 3 [see study]) compared to felid home ranges. Moreover, canids used these routeways more extensively than did felids, as quantified by the greater ridge-associated probability mass in their home ranges (SI Appendix, Figs. S5–S7). These results, which control for variation in home range size, contrasting hunting strategies and landscape characteristics, as well as variation in the quantity and quality of movement track data, identify striking differences in carnivores’ space use with regard to reliance on reused travel routeways and the resulting internal heterogeneity of their home ranges. The magnitude and consistency of these differences are remarkable given the diverse challenges of collecting and working with field data across so many different species and landscapes.”

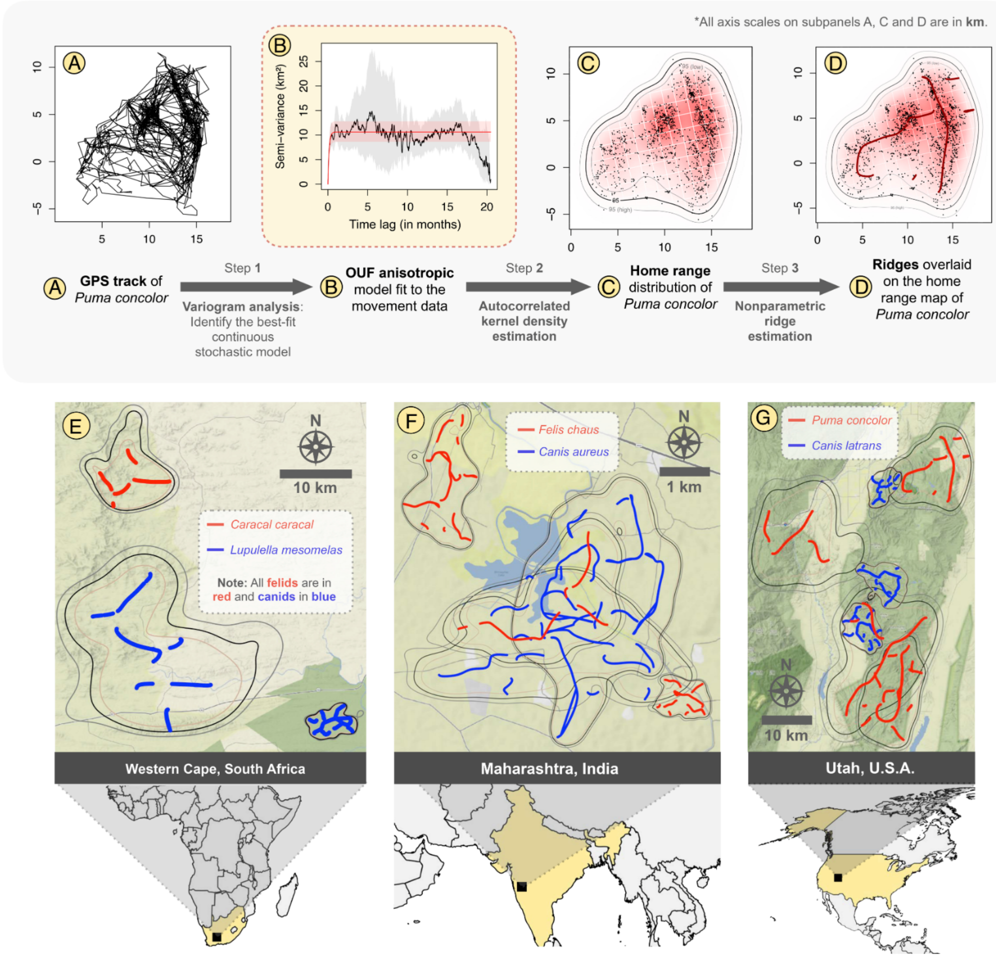
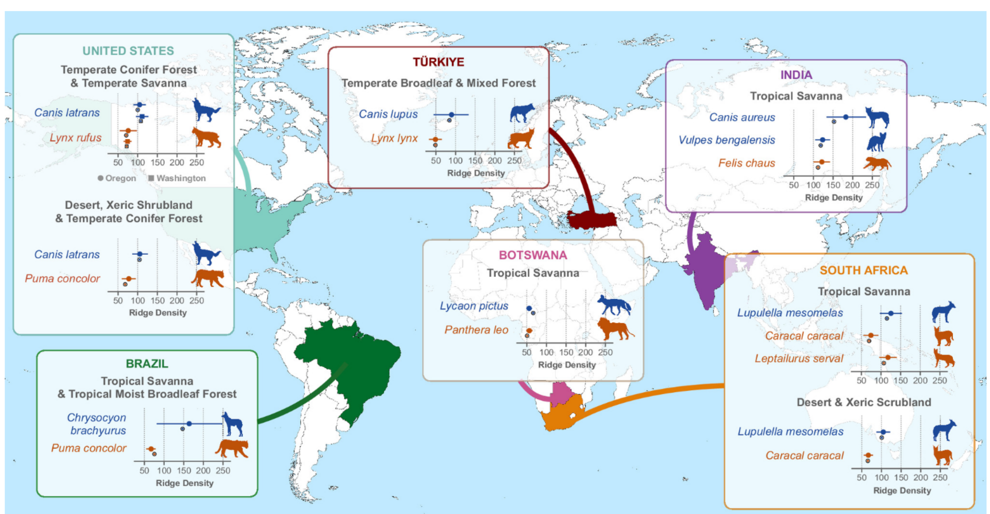


Fig. 4.



Ridge densities for canids and felids for the nine landscapes in which at least one species from each clade was tracked together (the shared landscapes dataset; n = 219 individuals total). Solid symbols are empirical means (±95% CI), whereas black-bordered, open symbols (offset lower) indicate means predicted by the statistical model for this dataset (SI Appendix, Table S3). At the clade level, canid ridge densities are on average 33% (±16 CI) higher than felids across the shared landscapes dataset (Fig. 3B).

Sugar

In the hills of Tennessee, where I was born, “sugar” meant diabetes, as in “he has sugar”. The what and why of diabetes was always an issue of concern.

In "Convergent and lineage-specific genomic changes shape adaptations in sugar-consuming birds", *Science* 391, eadt1522 (2026). DOI: 10.1126/science.adt1522), E. Osipova et al. report on their studies of the genetics of many bird species. Genetics which are the basis of physiological adaptations which allow the effective processing of the sugars from nectar and other glucose rich foods.

Too late for my uncle Livy, but advances in our understanding of sugar processing may someday eliminate "sugar".

A SpaceX Launch by John West

On January 2 of this year John West, who lives nearby, took the photograph shown below. I immediately felt a great deal of consternation. It was not taken in the Black Range, in fact quite far away - west of Phoenix. The vegetation was not the Black Range type - but Sonoran. The focal point was not natural history, instead a satellite launch.

But it is the best photograph I have seen in a long time. And I dare say, I see a lot of photographs. And, of course, we are talking subjectivity here, major subjectivity, and lest I drift into the interpretive side of art - probably the type of discourse I hated most as an undergrad - let me just say that I like it and leave it at that.

Why did it make it into The Black Range Naturalist? 'cause.

- Bob Barnes, Hillsboro

Bird Decline

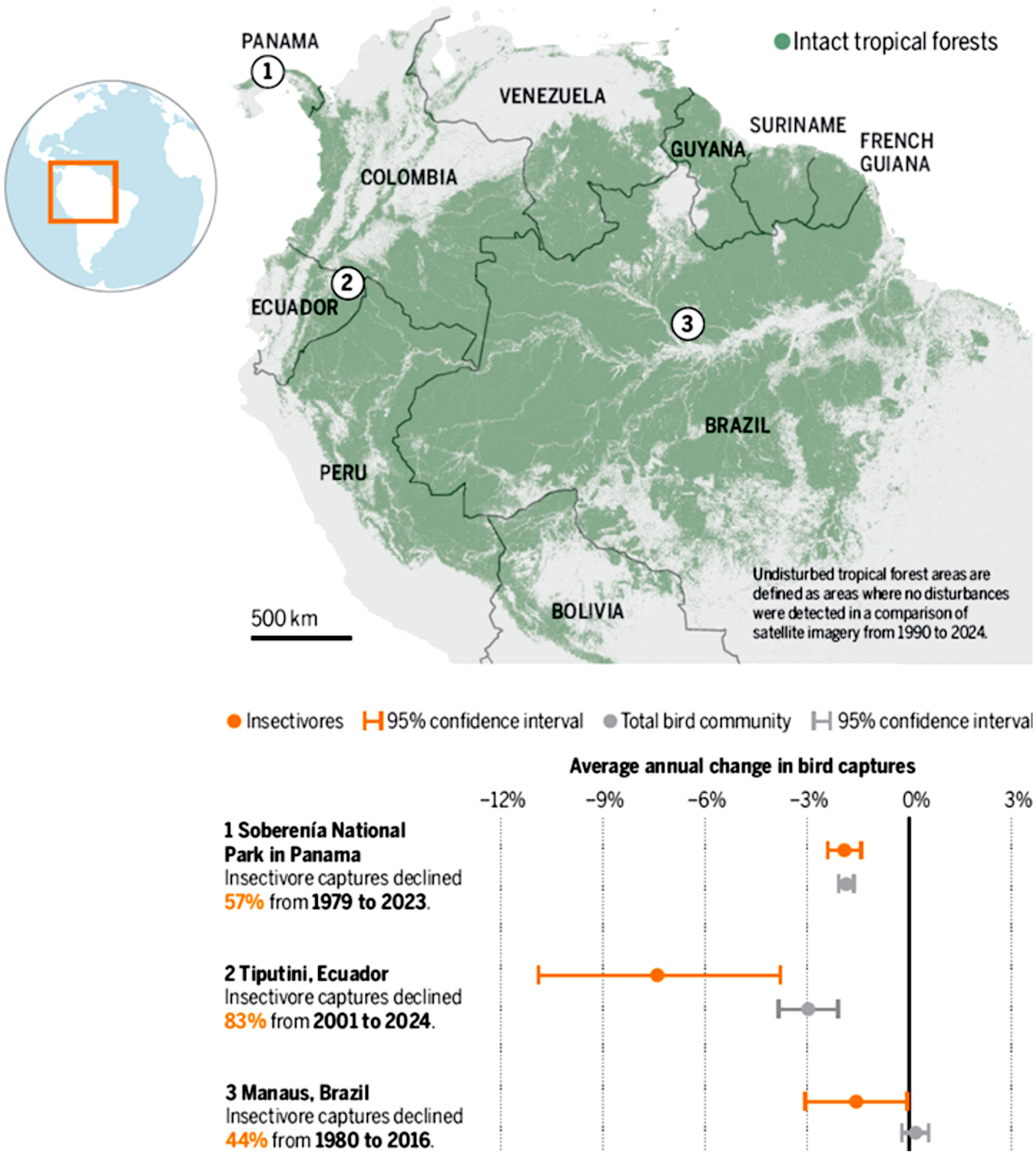
In the last issue of this journal we referenced the sharp decline in our local bird population, both in terms of total bird species being seen and in the number of individual birds being seen. A recent indication of that decline is shown by the results of the 2025 Hillsboro Christmas Bird Count.

In Fading Melodies (*Science*, February 26, 2026) Warren Cornwall summarizes the results of several studies completed over the last few years. Those studies document the decline of bird populations, by as much as 40%, in habitat which has apparently not been affected by human encroachment. A graphic summary of some of the studies is shown on the next page.

The culprit appears to be human-induced climate change. Climate change is associated with (and is apparently causing) wetter climate in some areas, drier climate in others, the drop in insect populations (bird food), as well as the increase in atmospheric temperature. Climate change is a complex phenomenon and manifests itself in myriad ways.

Stiller forests

Birds have become scarcer in recent decades at research sites across the tropical Americas—a hot spot of global bird diversity. Many of the species in decline are insectivores that live year-round in intact forests. Scientists suspect climate change may be to blame.



CREDITS: (GRAPHIC) V. PENNEY/*SCIENCE*; (DATA) JARED WOLFE/MICHIGAN TECHNOLOGICAL UNIVERSITY; J.G. BLAKE AND B.A. LOISELLE, *GLOBAL ECOLOGY AND CONSERVATION*, 51, E02902 (2024); E. H.S. POLLOCK *ET AL.*, *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES*, 119 (16), E2108731119 (2022); P.C. STOUFFER *ET AL.*, *ECOLOGY LETTERS*, 24, 13628 (2021)

The History of Science

The history of science is like a giant lego project. It progresses one block at a time, each a foundation for the next. Science progresses in the same manner, not by some great leap by an individual but rather by the accumulated effort of the community.

In "Islamic influence on the scientific method" Muhammad Khan notes that the scientific method, sometimes described as a 16th century European invention, was developed in the same manner, one block at a time. He notes: "The core practices that are now associated with modern science – systematic observation, experimental testing, quantitative analysis, and disciplined skepticism toward authority – were explicitly articulated and practiced during the Islamic Golden Age, which lasted from the 8th to 14th centuries. Ibn al-Haytham, for example, paired mathematical reasoning with controlled experimentation to overturn prevailing

theories of vision and argued that investigators must be guided by demonstration rather than deference. Scholars such as al-Biruni advanced careful measurement and attention to observational error, and Ibn Sina outlined rules for testing treatments that anticipate key elements of controlled, reproducible evaluation." (*Science*, February 26, 2026)

Probably

Do Homo sapiens and Large Language Models (LLMs) mean the same thing when they say "probably"? Apparently not. This is a big thing. In "An evaluation of estimative uncertainty in large language models" Z. Tang, K. Shen, and M. Kejriwal (*npj Complexity*, 3, 8, 2026, https://doi.org/10.1038/s44260-026-00070-6) found that we (*Homo sapiens*) should exercise some caution in this linguistic arena.

A LLM (kimi) summarized the issues this way:

"Implications: The study reveals a "communicative misalignment" between humans and LLMs: when an LLM says "likely" (meaning ~90%) and a human hears "likely" (meaning ~60-70%), trust and decision-making break down. This is critical for high-stakes applications (medicine, policy, intelligence) where LLMs are increasingly used to paraphrase scientific findings or communicate risk.

"Limitations (of the study): The human baseline came from a specific survey demographic (mostly young, educated, English-speaking males). Additionally, LLM outputs represent elicited behavior under specific prompting conditions, not necessarily internal "beliefs".

"In short: LLMs can approximate human uncertainty language for extreme probabilities but struggle with the nuanced, context-dependent middle range where most real-world communication occurs."

As Jon Barnes noted, "Yes, the irony of the robot summary is intended, but even worse, it is helpful."

The Glow of a Tanager

In our last issue we discussed the layered colors of Tanagers, referencing the Western Tanager in part. Gordon Berman shared photographs (above) of that species feeding on insects on a flowering *Yucca parryi.*

The array of shades of yellow and red is wonderful.

Links in Previous Issues of The Black Range Naturalist (BRN)

We have had to republish and reformat the Black Range Website. This may result in broken links in previous issues of the BRN. In all cases the broken links will be to previous issues of the BRN and the material can be located by context. Links to outside material are unaffected.

Predicting Landslides

Predicting land movement is important to housing developers, to insurance companies, and to the average Joe. All have an interest in knowing when the land they have an interest in might suddenly slide downhill, or when the hill above might become their, or someone else's, new yard.

If you walk or drive through the Black Range following a big rainstorm (our definition: anything over one hundredth of an inch) you are likely to see evidence that it can happen here. Rocks, some large, may be in the road; low water crossings may be covered in rock and sand a foot or more deep; a portion of the road may be gone; and road cuts may have calved onto the highway. Be glad you were not here when a good part of the mountain decided to relocate.

At the top of the following page there is a description of a geologic unit, IPme, which decided to relocate some time during the Tertiary, ~35 million years ago. The rock, of course, is much older, being from the Carboniferous. It just decided to relocate later in life. The geologic map detail just below the IPme description is from the lower left (southwestern) corner of the Hillsboro geologic quadrangle map. It is a huge chuck of the earth. It is more than a simple yard replacement.

Given our history in this regard, Jon Barnes performed some of his geology master's thesis work here. Conceptualizing, and building, a system of inexpensive motion detectors which could be linked together using a wireless neural network, he was able to evaluate earth movement across three axis. Output from one of the "runs" and some of the equipment is shown at the center of the following page.

Direct observation from systems like this can provide (generally short time-scale) warning of earth slippage and report on that activity from remote areas. They can provide some warning and identify areas in need of emergency resources much more quickly than other systems.

They are typically put into place where other methodologies have identified the potential for landslides. In general, such predictions are based on models of varying sophistication and/or efficacy.

Liu et al. noted that "Landslide risk is traditionally predicted by process-based models with detailed assessments or point-scale attribute-based machine learning (ML) models with first- or second-order features (e.g., slope and curvature) as inputs." (See "The value of terrain pattern, high-resolution data and ensemble modeling for landslide susceptibility prediction", *Journal of Geophysical Research: Machine Learning and Computation*, 25 September 2025.) They hypothesized "that terrain patterns might contain useful higher-order information that could be extracted, via computer vision ML models, to elevate prediction performance beyond that achievable with attribute-based models." They used a variety of input types, including imagery, to train the model and found that "Model performance improved with finer data resolution, reaching optimal performance at 10-m resolution, and variables such as rainfall, land cover, and soil moisture had the greatest impact on landslide susceptibility."

Along these lines, Barnes described his project as follows.

Resilient Arduino Sensor Network for Slope Monitoring: Ground Truth Validation

The efficacy of AI models predicting slope failure from satellite and aerial imagery hinges entirely on accurate ground truthing. This project introduces a sub-$100 low-cost, distributed sensor network built for this field validation; a complete six-node deployment, including solar power and batteries, is estimated to cost roughly $500 total. Each node uses an Arduino Nano and a HiLetgo MPU-6050 6-axis module to precisely measure tilt and subtle angle changes, with all nodes connected wirelessly via LoRa radios. Given typical hillside conditions with light tree cover, this six-node network is capable of reliably covering a hillslope area spanning approximately 2 to 3 square kilometers (0.8 to 1.2 square miles).

Communications and Range

The communication system relies on REYAX RYLR998 LoRa 915 MHz modules, which are fundamental to establishing the robust Logical Tree Topology. While effective range can reach several kilometers in open air, realistically, the system is designed to achieve reliable ranges of 1 to 3 kilometers (0.6 to 2 miles) in hillside environments with light tree cover, though this drops to below 1 kilometer in dense forest. Crucially, the Arduinos utilize standardized AT Commands to manage the LoRa modules, enabling the rapid reconfiguration process that drives the failover logic when a primary communication link fails.

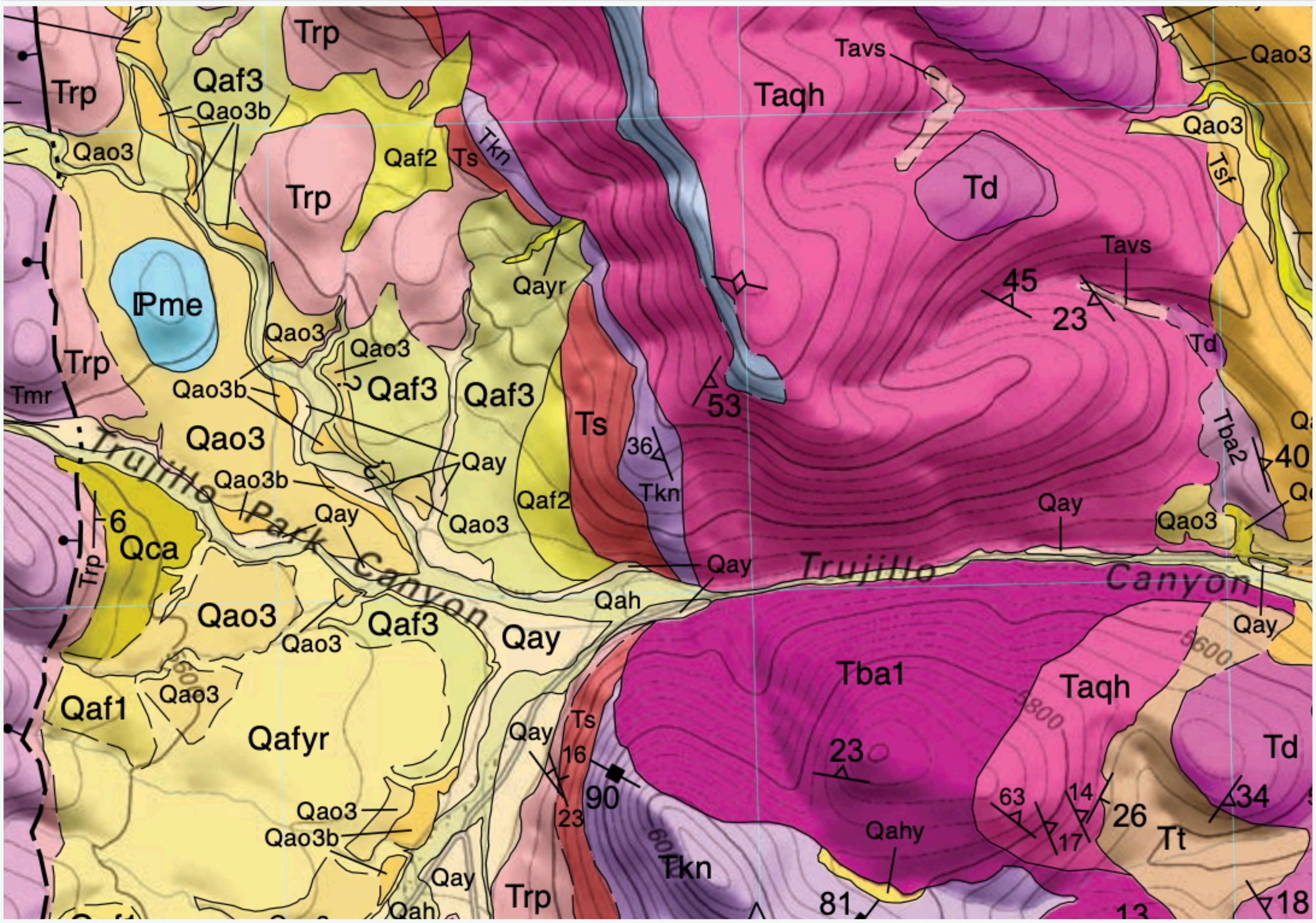
Flexible Deployment and Data Redundancy

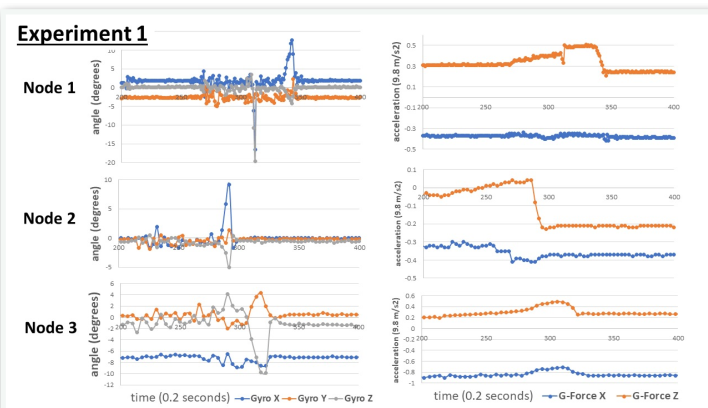
The six-node system offers flexible deployment for targeted monitoring. It can be placed in a long line across the top of a hillslope to monitor a specific fracture line, or arranged going down the hillslope with two sensors placed at the top, two in the middle, and two at the bottom to profile movement across different elevations. The network's base physical layout consists of a main stem of three sequential nodes with a single "leaf" sensor node branching off each point, with the main hub at a corner. For redundancy, all sensor data is saved locally to micro SD cards on each node, and the main hub saves all incoming telemetry to its own micro SD card, ensuring a complete, redundant long-term record.

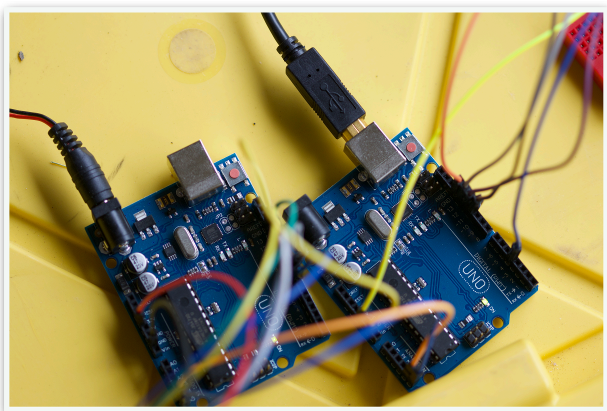
Logical Topology and Resilience

The network's ultimate resilience is achieved through its underlying Logical Tree Topology and integrated failover logic. Sensor nodes report hierarchically, and if a primary connection fails due to a hardware or path issue, the logic automatically and dynamically reconfigures the node to report to an alternate parent. A tabletop prototype demonstrates this resilience: simulating a slope movement and an intentional

ℙme **Exotic block of Magdalena Group limestone** – Observed in Trujillo Park Canyon. Transported during major landslide event(s). See **ℙm** description.







connection failure forces the node to execute the failover logic via AT Commands. This validates the network's capacity for self-healing and confirms its potential as a highly scalable, dependable, and affordable solution for acquiring ground truth data essential for advanced AI models.

The integration of advanced modeling techniques and immediate sensory networks will have significant positive impacts on public safety and property security.

Help Us Validate Our New Version of the Black Range Website

Much has had to be reconstructed on the newly formatted Black Range Website. If you find errors on the site, of any kind, please let the editor know. Data population continues on the site.

Obolopteryx brevihastata, Common Short-wing Katydid

The genus *Obolopteryx* (*Dichopetala* Brunner von Wattenwyl, 1878 - *Obolopteryx* Cohn, Swanson & Fontana, 2014) includes 14 species world wide, seven of which are found in the United States and Canada. BugGuide describes the genus as "Medium-sized, robust, flightless katydids. Forewings of females essentially absent (present as small scales). Males have short forewings used only in stridulation. Determination of species requires examining characters including the male cercus, female subgenital plate, and ovipositor."

Only one species, *Obolopteryx brevihastata*, of this genus is found in New Mexico. This species is generally found between July and October (inclusive) in desert and mesquite grassland habitat. It is ~2.5 cm long, not counting those long legs and antennae.

The individual shown here was photographed in Warm Springs Wash, northeast of Hillsboro, in August 2025.

Schistocerca albolineata, White-lined Bird Grasshopper

Whether they were green, brown, or black. Whether they were tiny or huge (relatively). Whether they flew or just hopped. Whether they were very much alive or smashed on your windshield. October and November 2025 was the time of grasshoppers and they were everywhere.

Strangely, the fact that there are so many did not make it easier to identify any one individual to species. Turns out there are a number of grasshopper species in this area, that each instar can look different, very different, from its predecessor or what comes next, and there are significant regional and individual differences to contend with. Great fun. Well....

In an outing to Andrews (north of Animas Peak, by Copper Flat) hiking companions noted the jewels flying through the sky. The wings of grasshoppers can glimmer in a variety of colors as they plow through the air. Greens, turquoise-blue, yellows, and reds seem to predominate but some are more subtle.

I suspect that the individual shown above is *Schistocerca albolineata*, White-lined Bird Grasshopper. It looks a lot like *S. obscura*, the Obscure Bird Grasshopper, but note the red hind tibiae.

In describing this species, BugGuide notes that it is "Similar to *S. lineata* and *venusta*, but more contrastingly marked, with bold dark bars on the hind femora. This species is dark olive green or brown to black, with contrasting pale yellowish markings, and bold contrasting markings on the hind femora, with the hind tibiae red to black.

"Occasionally individuals are green with fewer pale contrasting markings, but still have bold contrasting black markings on the hind femur. These closely resemble eastern *S. obscura*, but usually have red hind tibiae. Their appearance raises interesting questions about possible hybridization, and they are often misidentified."

Although the taxonomic boxes have been, more or less, sorted at this point, which individuals belong in which boxes is still unclear at times.

Copriopsis lagopus (?)

On September 29, 2025, we noted this observation by Rebecca Hallgarth and Jan Haley; two photographs by Rebecca Hallgarth are shown here. This (very) small mushroom was discovered growing in the right-of-way along NM-152 in Hillsboro. (The cap was from 2 to 3 cm across.) The observation was identified as a possible *Coprinopsis lagopus*.

Coprinopsis lagopus **is one of the** **coprinoid** **(inky cap) mushrooms which decompose wood. This type of mush-room is found throughout the world and there are many species of this type, so this identification to species must be treated as tentative, perhaps suspect.**

Most coprinoid mushrooms have black spores but no spore print was taken of this individual.

Coprinoid mushrooms are fascinating from a number of perspectives. For instance, Rebecca and Jan observed the mushroom as it is shown here in mid-morning. By mid afternoon, it was gone.

The common name of these mushrooms is descriptive of the spore dispersal system used by these species. When the mushroom is mature the gills "liquify", producing a black "ink" which can reportedly be used as writing ink. The production of this ink is not, however, diagnostic of a coprinoid mushroom (or even of members of this family) since other types of mushroom also do this.

The gills begin the "liquidation" from the outside edge of the cap toward the stem. This causes the cap to curl upward and over itself. This process exposes the mature spores to the wind and is an effective method of spore dispersal.

Lentinus arcularius

Inspired by the observation of Hallgarth and Haley on the 29th, I went to the area where they observed the possible *Copriopsis lagopus* noted on the previous page. I did not find another of "their" observations. Instead, I found this Spring Polypore, ***Lentius arcularius***. Note the fringe of cilia along the

margin of the cap. In our area this mushroom appears in the fall, often on the wood of Gambel's Oak.

The current Latin binomial was assigned in 2008 based on work by Sotome et al.; previously it was designated *Polyporus arcularius*.

This is a small mushroom. Note on the previous page that the stem is somewhat less than 3 cm long and the cap is from 1.5-2 cm in diameter.

Human transformation of past terrestrial ecosystems

In Volume 7, Issue 2, of this journal we discussed American Beaver reintroduction programs, and in Volume 8, Issue 3, we discussed reintroduction/deextinction/restoration efforts more broadly. A significant issue in all projects of this type is defining the baseline. Restore to what?

Many people have put a lot of effort into the "baseline issue". On 19 September 2025, S. Nogué, N. Morueta-Holme, J.M. Fernández-Palacios, et al. published a survey of current methodologies used to assess this issue and our current state of knowledge on the topic. ("Human transformation of past terrestrial ecosystems", *Nature Reviews Biodiversity*, 1, 644–656 [2025], https://doi.org/10.1038/s44358-025-00081-6). This article is behind a paywall.

The abstract of the article reads: "Humans have been modifying ecosystems for millennia. By the start of the Holocene, approximately 11,500 years ago, human societies were influencing an estimated three-quarters of terrestrial ecosystems. In this Review, we focus on how advances in archaeology, biogeography, history and palaeo-ecology, combined with modeling techniques, are enabling researchers to evaluate long-term human influences on ecosystems across different spatial and temporal scales. We describe key methods for studying human transformations on past ecosystems, and explore how humans have shaped ecosystems across space and time. We outline ways that human societies have

transformed global ecosystems with increasing intensity and diversity, driving accelerated rates of ecological change that often surpass natural variability. Processes such as species extinctions, introductions and range shifts have also altered patterns of biodiversity and ecosystem functions. Despite major advances in understanding human effects on ecosystems, important knowledge gaps remain. These gaps include information about novel ecosystems, hybrid cultural-natural ecosystems, accurate prediction of rates of change and chronological control of potential drivers of change. Addressing these gaps demands improved research methods and interdisciplinary approaches to better anticipate and mitigate future anthropogenic disturbances on global biodiversity."

Oslar's Oakworm Moth Caterpillar *Anisota oslari*

In the April 2023 issue of this journal we referenced observations of Oslar's Oakworm Moth Caterpillar along Scenic Trail 796, west of Kingston. On October 7, 2025 we returned to that site and found them at work again.

In the 2023 article we also discussed caterpillar anatomy, including the anterior prolegs. During our 2025 observation we were able to capture some images of caterpillar appendages.

When observed without aids, the anterior prolegs look like little suction cups, but they are not. Within each proleg

there are many filaments with grasping hooks, shown well in the image at the bottom left.

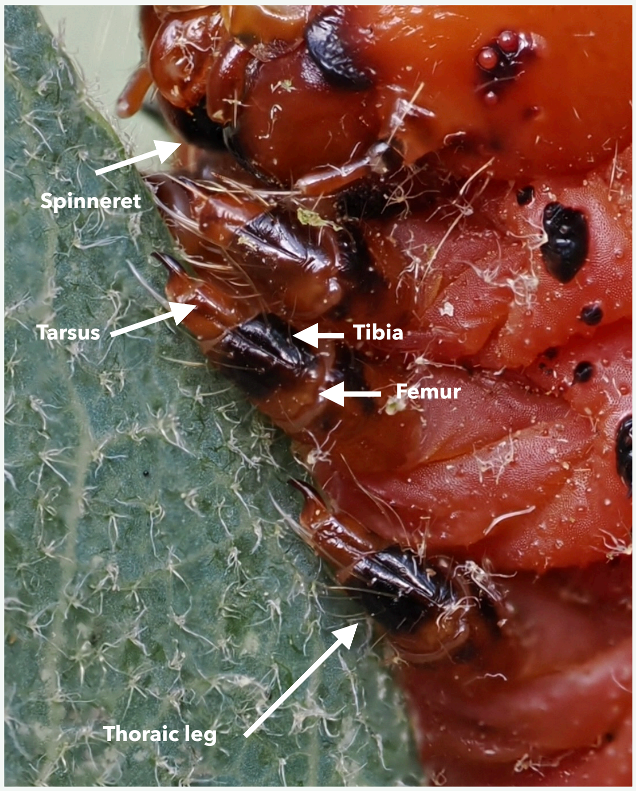
Behind the head of the caterpillar there are three pair of thoracic legs (a.k.a. forelegs). They are used to grasp leaves while the caterpillar eats, among other things. See the two images in the left column of the next page. The top one is a detail of the image below.

In the detail it is possible to see the femur, tibia, and tarsus of the leg as well as the claw at the end.

The images in the right column on the following page show both types of legs being utilized.

Caterpillars produce silk from the spinneret which is located with the mouth parts. Several types of silk may be produced by a caterpillar. The spinneret is labeled in the detail at the top left of the following page.

On October 10 I returned to the site to shoot additional video. The video from the 7th and 10th may be viewed at this link. On the 10th I noted that the rhythmic movement of the head was not associated with feeding, which I had surmised on the 7th. Instead, it appears to be a defensive



reaction apparently triggered by shadows. On a few occasions I noted that the shadow of the camera seemed to trigger the behavior and on another a cloud obscured the sun and seemed to trigger the behavior. Random movement of the bush did not seem to trigger the behavior, nor did playing 512 mhz (middle c) or 728 mhz (F sharp above C). These tones are purported to generate defensive behavior in *Datana neomexicana* - which was the "target" for these outings. The Oslar's Oakworm Moth caterpillar just happened to be there instead.

DOE climate report 'demonstrably incorrect', say scientists in new analysis

This article describes the politicization of science by the trump administration in one key area of study. That being, how is it that the human species continues to survive on this planet.

In "Modeled and Observed Stratospheric Temperature Changes: Implications for Fingerprint Studies" (*AGU Advances*, 24 February 2026) Benjamin Santer, Susan Solomon, David Thompson, and Qiang Fu note that the claims made in the trump administration's finding on human-induced climate change "is factually incorrect". The original studies by Santer et al. (and the studies of thousands of other honest, knowledgeable, and responsible researchers) established the fact that human actions have caused the temperature of the earth's atmosphere to increase at a faster rate than it has ever done before.

The data in this area are clear, the standards of analysis are clear, the 2009 endangerment finding is based in fact. "Facts" and interpretation made by the trump administration are not true.

The trump administration has used their report to "reverse the so-called 2009 'endangerment finding' – a ruling that gave it the legal authority to regulate emissions of greenhouse gases, for example from vehicles, power plants and other industrial sources". Agencies, like the United States Forest Service and the Bureau of Land Management, have already moved forward with annulling environmental regulations and use requirements based on the facts presented in the 2009 endangerment finding.

Santer et al., in their "Plain Language Summary" of their article note:

"Human-caused changes in carbon dioxide and stratospheric ozone have altered the temperature structure of Earth's atmosphere, warming the lower atmosphere – the troposphere – and cooling the layer above the troposphere (the stratosphere). This canonical "fingerprint" of human effects on climate has been predicted for over 50 years by simple and more sophisticated climate models, and is identifiable with high confidence in satellite temperature data. A recent claim to the contrary in a report by the US Department of Energy is incorrect."

We have seen political institutions intervene many times in situations where science has exposed facts which are inconvenient for the political operatives and their owners. The Catholic Church banned Nicolaus Copernicus' *De revolutionibus orbium coelestium* from 1616 to 1835. The fact that the planets in our solar system rotated around the sun was inconvenient for the Church, so the science was banned. The same treatment was doled out to Galileo. There are more than a few individuals and institutions who would like to rewrite this history to reflect more favorably on the institutions, to make up "facts" and make the types of interpretations you see at recess on third-grade school yards.

In "When Facts Become Forbidden" Douglas Mann (*Journal of the American College of Cardiology*, Volume 10, No. 3, 21 February 2025) outlines this history of suppression. He notes:

"Progress in science relies on open inquiry, rigorous debate, and the ability to share findings without undue interference. However, throughout history, scientific research has often been subject to suppression, whether from religious doctrine, political ideology, or corporate interests, often with untoward consequences for public health. More recently, concerns about the influence of politics on science have resurfaced, particularly in cases where government agencies are adjusting and retracting scientific publications."

Trofim Lysenko, one of Stalin's "scientists" argued that the genetic studies of Gregor Mendel were fascist and Stalin suppressed the use of Mendel's concepts in the Soviet Union. Mann notes that Stalin's "agricultural policies contributed to agricultural failures and widespread famine in Russia and China, including the Great Chinese Famine of 1959-1961, which occurred after Mao Zedong adopted Lysenkoist agricultural methods."

Hitler and the Nazis denounced the work of Albert Einstein. Responding to their efforts Einstein quipped "to defeat relativity one did not need the word of 100 scientists, just one fact." But, of course, there were no facts - just "facts" (fabrications which were more convenient).

And so the show goes on, it's just that this many be one of the last times it happens.

Phoradendron villosum (Nuttall] Nuttall ex Engelmann subsp. *coryae* [Trelease] Wiens)
Oak Mistletoe a.k.a. Cory's Mistletoe

In the January 2025 issue of this journal we noted observations of this species along NM-152. It is a common species in our area.

On October 8, 2025, we observed several specimens which were just coming into seed (images on the next page). They were along the Scenic Trail from the Kingston Cemetery to Emory Pass.

At the same time, mistletoe seed was appearing in bird baths in Hillsboro, brought to the watering stations by birds of several species.

"What's New"

The newly formatted Black Range website - still under construction and still being "populated") includes a "blog" which is a bit different from blogs you may be familiar with. It has a "temporal structure" not generally associated with blogs. The blog entries are focused on the website and other "Black Range" efforts as well as natural history observations. When blog entries are repeated in publications like this journal or are no longer relevant they will be deleted from the blog.

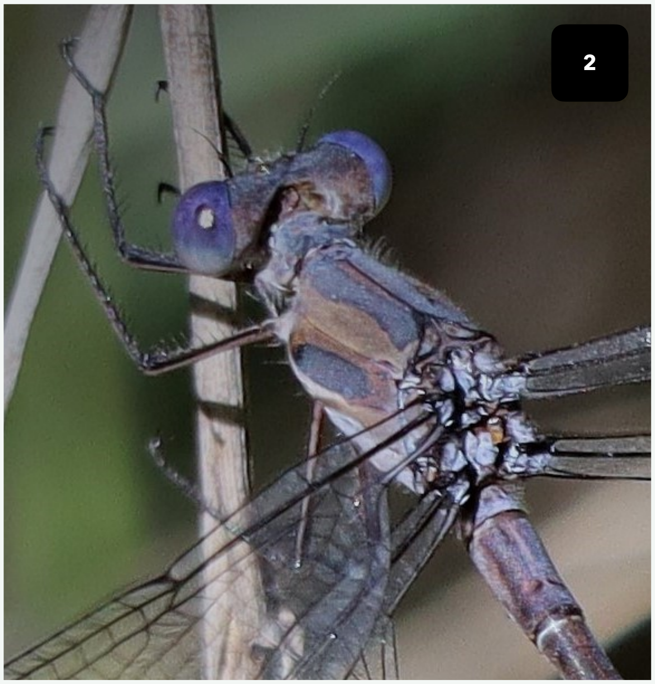
California Spreadwing
Archilestes californicus
(McLachlan, 1895)
by James Von Loh

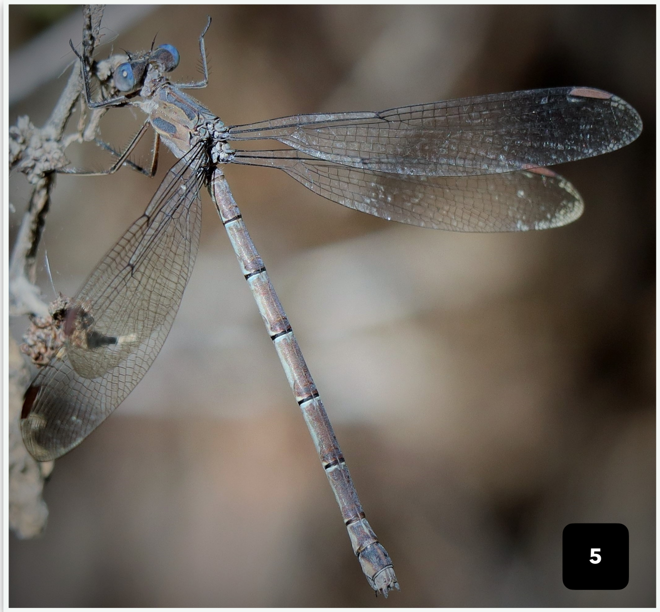
During the Autumn of 2025, California Spreadwings were first observed along the Rio Grande on October 24th (2 perching males) along the Lower Mogollon Trail in Leasburg Dam State Park and on October 25th (1 mating pair) west of Mesilla. There were no additional sightings west of Mesilla for the remainder of the field season (through mid-December). The Lower Mogollon Trail and adjacent open areas supported consistent activity by 1-8 individuals observed on various field days; behaviors included perching, hunting, territory defense, patrolling, and mating. A summary of my observations within Doña Ana County, with field images and text, is presented below.

Perching

Individual males hanging from various twig and branch perches (~0.5m-2m high) while hunting and defending territories were the most commonly observed behaviors. Females, perching (from near the ground surface to ~0.5m high typically on dense patches of grass species and adjacent overhanging twigs) while hunting and exhibiting mating behaviors were uncommon observations. All individuals used perches in dappled sunlight or in full sunshine adjacent to shaded areas. The males typically emerged to perches about 1/2 hour before females, between the hours of ~10am-2pm daily.

1. Male with pruinose (whitish-blue color on thorax and abdomen tip) coating, perches by hanging from a dead stem in a visible location, a typical observation along the Lower Mogollon Trail (12/01/25).
2. Enlargement illustrating the pruinose condition/distribution on this male's thorax (12/01/25).
3. Enlargement illustrating reduced pruinosity and brighter blue coloration on this male's thorax (11/09/25).
4. Male with less extensive pruinose coating perches by hanging from a dead stem in a visible location, along the Lower Mogollon Trail (11/28/25).
5. Pruinose female in lateral view, landing to perch low by hanging from a dormant twig along the Lower Mogollon Trail (11/17/25).

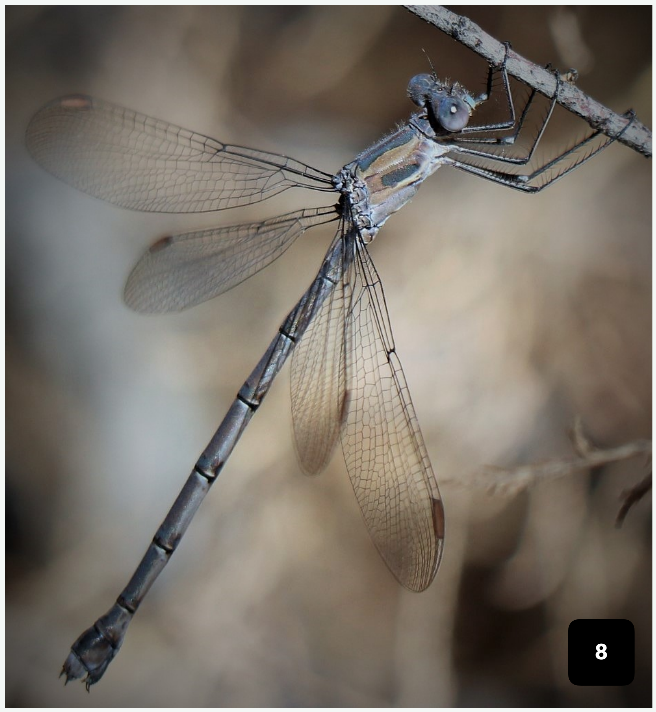


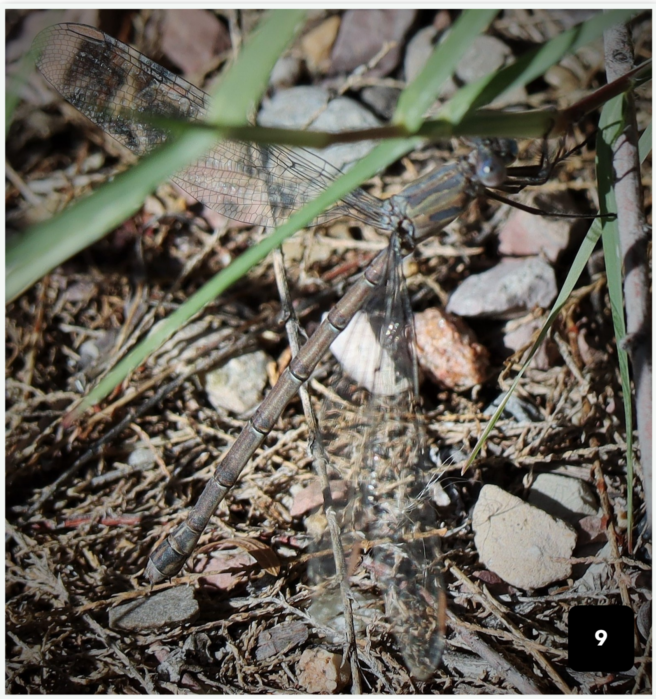


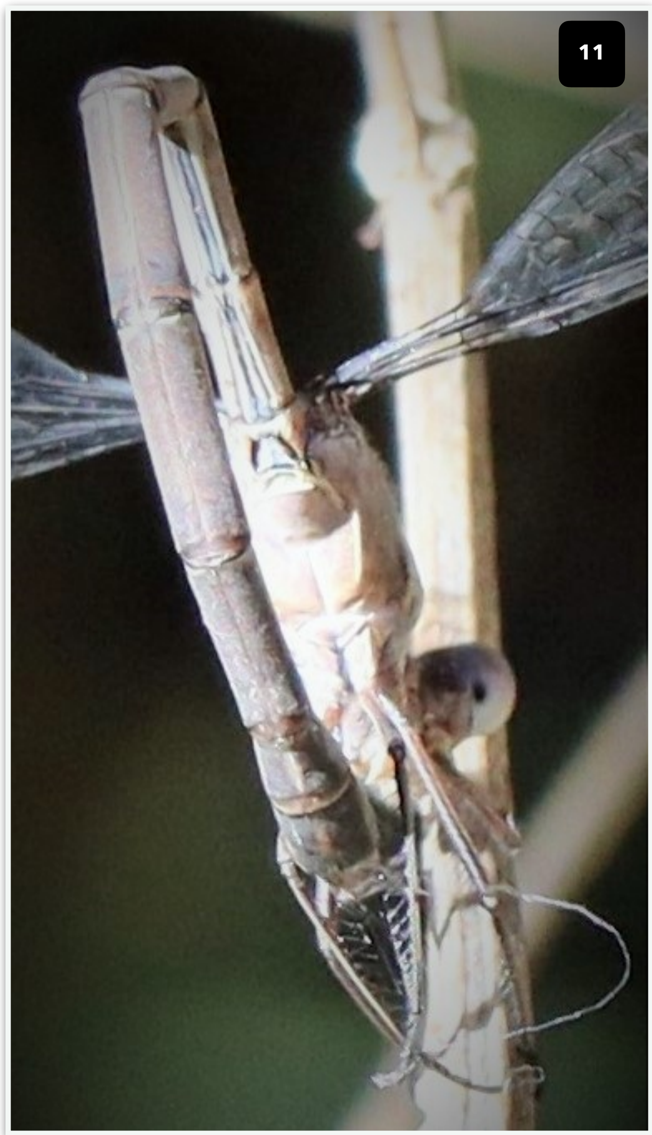
6. **Enlargement illustrating this female's light blue lower face and moderately pruinose thorax (10/31/25).**
7. **Pruinose female in dorsal view, perching low in a shaded area by hanging from a dead tamarisk twig along the Lower Mogollon Trail (note her thicker abdomen and expanded S8-S10 abdominal segments when compared to the male) (10/31/25).**

Abdominal Flexing

Both males and females, when arriving to perch, have been observed/photo-documented flexing their abdomens vertically up and down, likely to attract a mate. On November 29, 2025, the female illustrated below spent several minutes on two different perches, flexing her abdomen to extreme positions, touching the tip to the perch as if ovipositing (she was along Lower Mogollon Trail ~10m from water and they oviposit into leaves and stems overhanging water), and apparently grooming her abdomen with her legs as if removing foreign material (possible spider web strand, etc.).



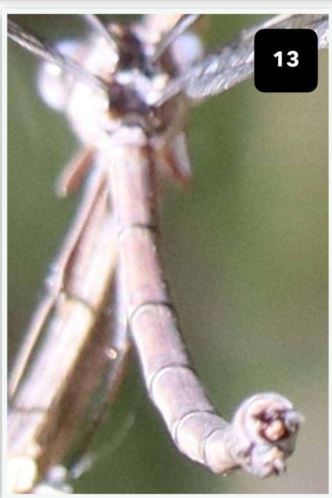




8. **Lateral view of this perching female illustrates her enlarged S8-S10 abdominal segments and the sharp points of her ovipositor which is designed to puncture plant tissues into which she deposits eggs (10/31/25).**
9. **Female emerging from overnight cover perches on a dried stem among Bermudagrass leaves, just above the ground surface; females have generally been observed perching low and flying up to mate with an available male (11/29/25).**

12

10. Female begins flexing her abdomen downward immediately after landing on a low perch. She nearly extends to the perch surface.
11. In this process she brings the spines of the two back legs to a closed position and there appears to be a long fiber, which may be attached to a middle leg, on the right.
12. She then begins to rapidly elevate her abdomen (note the fiber hanging from her legs).
13. Then reverses the abdominal bend to a dorsal position (note the digested material ready for elimination).
14. Rapidly she elevates to a near vertical position, then lowers her abdomen to horizontal and repeats the extreme upward dorsal bend.
15. As she quickly lowers her abdomen to her original ventral flex a fiber appears across the abdomen tip and she releases digested material from her abdomen.



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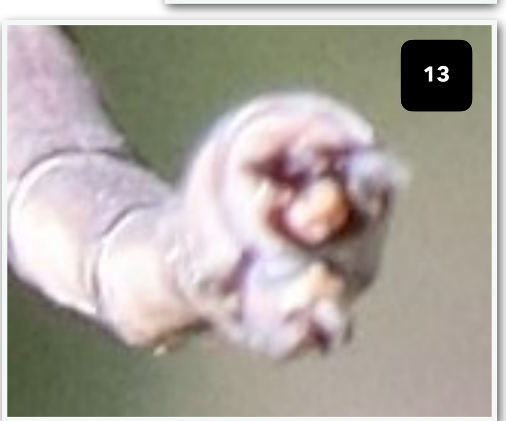

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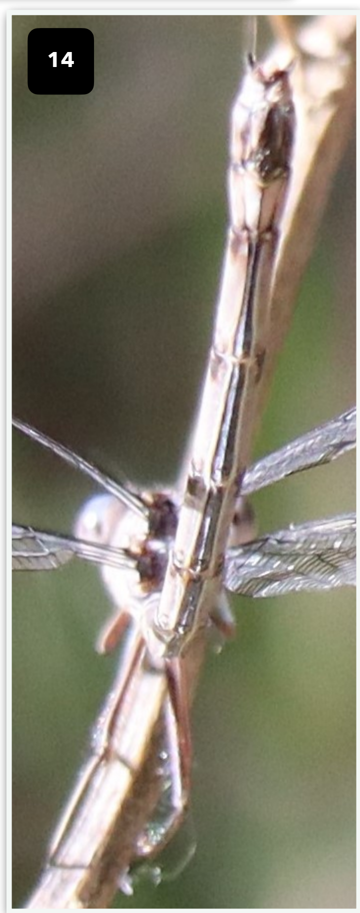

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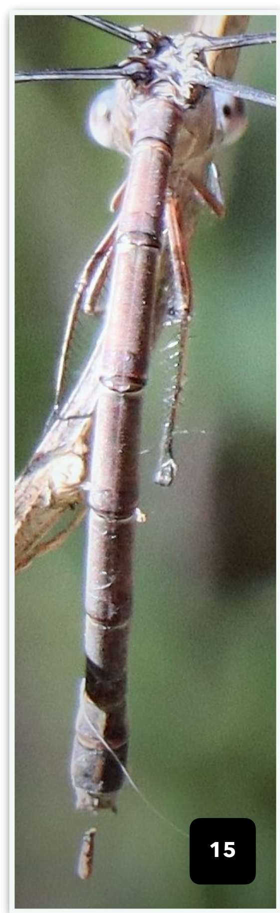

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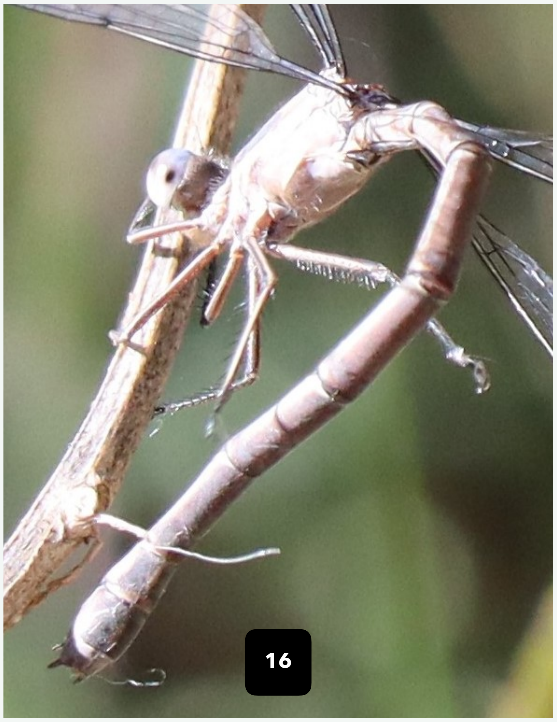
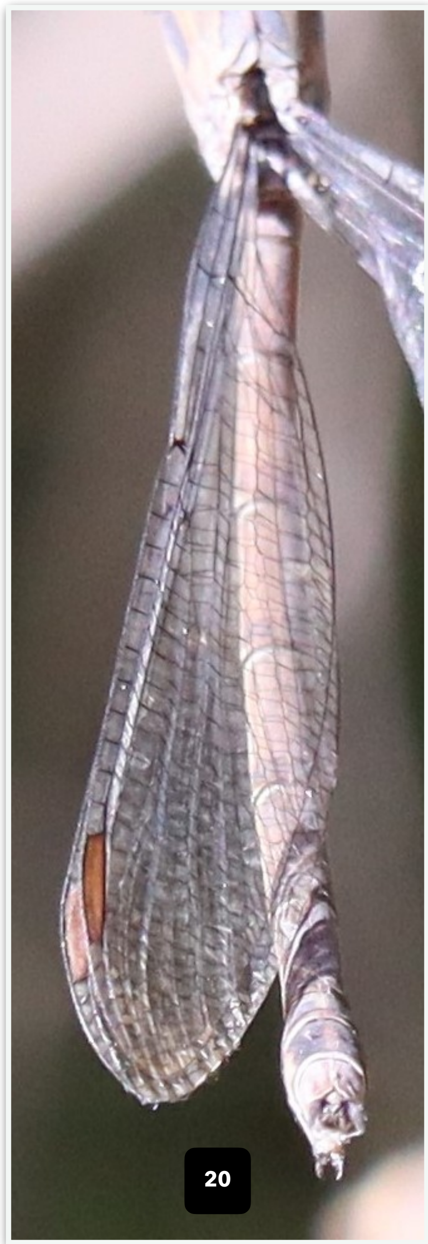
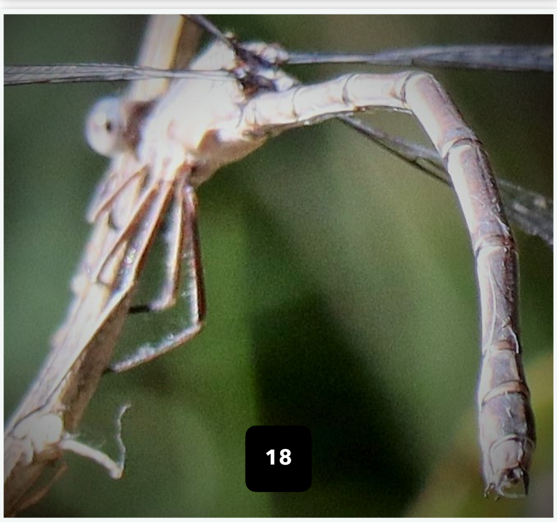
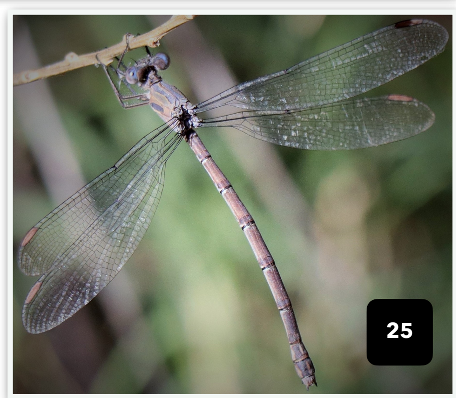


16. **She carries the fine fiber towards the stem where another fiber occurs,**
17. **Then guides her ovipositor to the stem surface with her back legs (with fibers).**
18. **She then raises her abdomen upward from the perch stem (note foreign material on the S7 segment).**
19. **She briefly relaxes in the vertical position, hanging from the perch.**
20. **Then begins to elevate her abdomen in a dorsal arc.**
21. **But flips it quickly down into an extreme ventral bend.**
22. **Again she relaxes towards the vertical.**
23. **And again flips her abdomen ventrally to the perch twig.**
24. **Her ovipositor appears clear of all foreign material (note fibers attached to her legs) as she relaxes her abdomen position.**
25. **And she completes the several-minute process in the near vertical position, hanging from the perch.**







Foraging

When California Spreadwings have emerged to perch and conduct behaviors related to reproduction, they are opportunistic foragers of small arthropods (mostly species of flies).

26. Male, hanging from a Bermudagrass leaf, ingests a small fly (note his blue lower mouth parts are opened) (12/03/25).
27. Male, hanging from a dead twig, appears to ingest something mysterious that he captured (12/03/25).

Mating

Two mating events were observed and photo-documented along the Rio Grande in the 2025 field season, one each west of Mesilla and along the Lower Mogollon Trail at Leasburg Dam State Park.

28. This image illustrates tandem linkage and mating wheel formation while perched on a dense patch of Bermudagrass adjacent to the Lower Mogollon Trail (November 28, 2025).

(Ed. In a sequence of photographs, which unfortunately had very busy backgrounds and could not be reproduced in this article, Jim described a mating sequence, as follows:)

The male captured a female to create a tandem linkage, flew her to the top of a dense patch of Bermudagrass (~0.5m high), then drew her upward, by arcing his abdomen tip, to begin formation of a mating wheel. The female joined in the mating wheel by placing her S8 segment over his S2 segment and began fertilizing her eggs. After several minutes in the mating wheel, she released from copulation and relaxed into vertical tandem linkage. The male again pulled her upward to reattach and reform the mating wheel configuration. And she again elevated her abdomen to reattach the S8 to S2 connection. Then they continued copulation for several more minutes; note how this 2nd mating wheel orientation allowed a clear view of lateral male and female morphological features (image 28).

After a few more minutes, the pair completed copulation, reformed the tandem linkage configuration, then flew ~10m through dense tamarisk canopies (likely to oviposit into coyote willow, Baccharis, and/or tamarisk branches overhanging a large pool along the Rio Grande bank).

The Longhorn Beetles of Sierra and Doña Ana Counties

Worldwide there are more than 30,000 species of longhorn beetle, Family *Cerambycidae* (Latreille, 1802). They are distributed within ~5000 genera. Understanding the taxonomic arrangement of these species can be problematic at times because the complexity of life that they represent does not fit nicely within the simplest species-genus-family arrangement of the Linnean System taught in introductory biology courses. As we have tried to squeeze large numbers of species into discrete boxes, in a manner which contributes to our understanding of their relationships, it has become necessary to define a variety of subcategories within the species-genus-family arrangement. There are species and subspecies for example - and subspecies are often broken into differing population descriptors. Some species are grouped within a genus in variously labeled categories (i.e., superspecies, group, etc.). These types of subcategories are also found within "families". In providing an overview of this family we will hopefully not get caught in the weeds and we can enhance our collective understanding of these rather interesting creatures.

There are more than 1000 species of longhorn beetle, in more than 300 genera, in the in the United States and Canada. We (speaking specifically about the editors and contributors to the *Black Range Naturalist*) are not able to provide a definitive count of species found within Sierra and Doña Ana counties.

Taxonomic revision within the insect world has been extensive and is continuing. Understanding previous taxonomic determinations is very helpful, but daunting. Scientific synonyms for the genus *Strangalia*, for instance, include (but are not limited to) *Ophiostomis* (Gemminger & Harold, 1872), *Strangalina* (Aurivillius, 1912), *Ophistomis* (Thomson, 1857), *Strangalidium* (Giesbert, 1997), and *Sulcatostrangalia* (K. Ohbayashi, 1961). And, of course, "specific" species have been moved between genera from time to time. Not to mention the lumping and splitting of various taxonomic groups, like species and subspecies. So tread lightly and go with humor.

To add to the confusion, the appropriate attribution for the original describer is sometimes disputed or simply uncertain.

All of the above should be considered when reading what follows. And it may not be possible to identify the species of an individual from a photograph, regardless of the quality of the photograph.

And remember all of those larvae and pupae, which don't look like the adults at all.

Despite, or perhaps because of, the challenges represented above, learning something about the longhorn beetles can be an intriguing and, yes, fun effort.

A Fire-necked Longhorn Beetle, *Batyle ignicollis* (Say, 1824) is shown at the upper right in a photograph by James Von Loh at the Soledad/Bar Canyons Trailhead on 11 May 2024.

References

Resources like BugGuide and The Coleopterists Society Website are common "go to" references for "bugs" in the United States and Canada, including the longhorn beetles. In the case of the longhorn beetles, there are other great resources. For instance, the comprehensive online catalog of longhorn beetles maintained by Larry G. Bezark and the work by Steven Lingafelter, who has revised the longhorn beetle chapter of the new edition of *Beetles of the United States and Canada* (forthcoming), are outstanding efforts. Biological and Distributional Observations on North American Cerambycidae is also a good source for tracking specimens.

Taxonomic Arrangement

The following taxonomic arrangement for this family is taken from BugGuide. Only those which might be found in our area are listed.

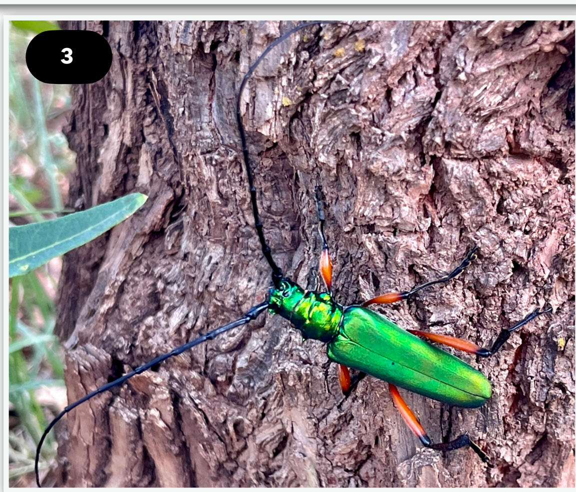
Family *Cerambycidae* - Longhorn Beetles

Subfamily *Cerambycinae* (Latreille, 1802). ~440 species in ~160 genera of 37 tribes in the United States and Canada.

Tribe *Achrysonini* (Lacordaire, 1868). 3 species within 3 genera in the United States and Canada. Only one species might be found in our area (see note).

Genus *Achryson*. 1 species in the southwest.

1. *Achryson surinamum* (Linnaeus, 1767). Found in southern Arizona and southeastern Texas. It is unclear what these disjunct populations represent - a gap in range, different species, lack of observation . . .? Found as far south as southern Argentina. The image on the next page is from southeast of Tucson. It is curated on iNaturalist, shown under a Creative Commons license. Follow link.



Tribe *Bothriospilini*

Genus *Chrotoma* (Casey, 1891) Monotypic genus.

2. *Chrotoma dunniana* (Casey, 1891). Limited number of observations in the southern part of the southwest. Found in southern Arizona and southeastern Texas. It is unclear whether these disjunct populations represent a gap in range, different species, lack of observation. . . . Found as far south as northern Mexico. This image, by Andrew Wesley Legan, is curated on iNaturalist and is shown under a Creative Commons license. Follow link.

Tribe *Callichromatini* (Swainson, 1840)

Genus *Plinthocoelium* (Schmidt, 1924)

3. *Plinthocoelium suaveolens suaveolens* (Linnaeus, 1768). Limited number of observations in the southern part of the southwest. Found in northern Sonora and eastern Texas. It is unclear what these disjunct populations represent - a gap in range, different species, lack of observation. . . . Found as far south as Panama. This image, by Ted C. MacRae, is curated on iNaturalist and is shown under a Creative Commons license. It is from north central Texas. Follow link. This subspecies is unlikely in our area.

4. *Plinthocoelium suaveolens plicatum* (LeConte, 1853). This subspecies is found in west Texas and in Arizona (image shown on the following page is from south of Portal, Arizona). Curated on iNaturalist and shown here under a Creative Commons license; from Paul Dennehy. See earlier notes about disjunct populations. Check those Mulberry trees; this burrower seems to prefer them. This species is highly variable in color. Compare this image with the other subspecies, "3".

Tribe *Callidiini* (Kirby, 1837)

Genus *Callidium* (Fabricius, 1775). There are 19 species of *Callidium* in the United States and Canada.

5. *Callidium antennatum hesperum* (Newman, 1838) - Blackhorned Pine Borer. The image shown here is an observation on iNaturalist by Tony Palmer, shown here under a Creative Commons license. This beetle was captured west of Portal, Arizona, on 4 May 2024. There are two subspecies of *Callidium antennatum*. This subspecies is found in the west. It feeds on dead conifers. BugGuide, citing an entry about the eastern subspecies in *Eastern Forest Insects* by Whiteford Baker, notes that "Eggs are laid beneath bark scales on dead trees or overwintered cut wood. The larvae feed on the phloem and outer sapwood, making broad wavy tunnels and pushing frass out through small holes. Pupation occurs in the wood in long cells plugged with wads of frass. Usually one generation per year." And for context, yes that is a thumbnail in the lower right of the image. This is a small beetle.

Callidium californicum (Casey, 1912). As of 29 June 2025 BugGuide only has one observation for this species, from California. iNaturalist does not have any observations of the species as of that date. However, the GBIF database indicates two specimens, one from California and a specimen curated by the New Mexico State Collection of Arthropods, a specimen collected on 20 February 1980.

6. *Callidium texanum* (Schaeffer, 1917) - Black-horned Juniper Borer. This is the only species of *Callidium* which breeds in juniper. This iNaturalist observation, by "hayesbug", was made just north of Albuquerque. It is shown under a Creative Commons license.

Genus *Phymatodes* (Mulsant, 1839).

There are 26 species of *Phymatodes* in the United States and Canada. BugGuide indicates that individuals in this genus "can be distinguished from other NA callidiines by reduced metacoxae, subcylindrical body, and generally by smaller overall size".

7. *Phymatodes varius* (Fabricius, 1776). Another of those "no specimens or observations from this area" creatures. But, of course it is found in central Texas and southern Arizona. So, maybe? This photo was taken by Ted C. MacRae in the Coronado National Forest, west of Hereford, Arizona, on 30 April 2024. Shown here under a Creative Commons license.

Genus *Xylocrius*

Xylocrius agassizi (LeConte, 1861). BugGuide gives a range described as "BC-CA-NM, Rocky Mts". As of 29 June 2025 BugGuide has only 1 pinned observation, from California. iNaturalist has one unverified observation from Utah, west of Provo.

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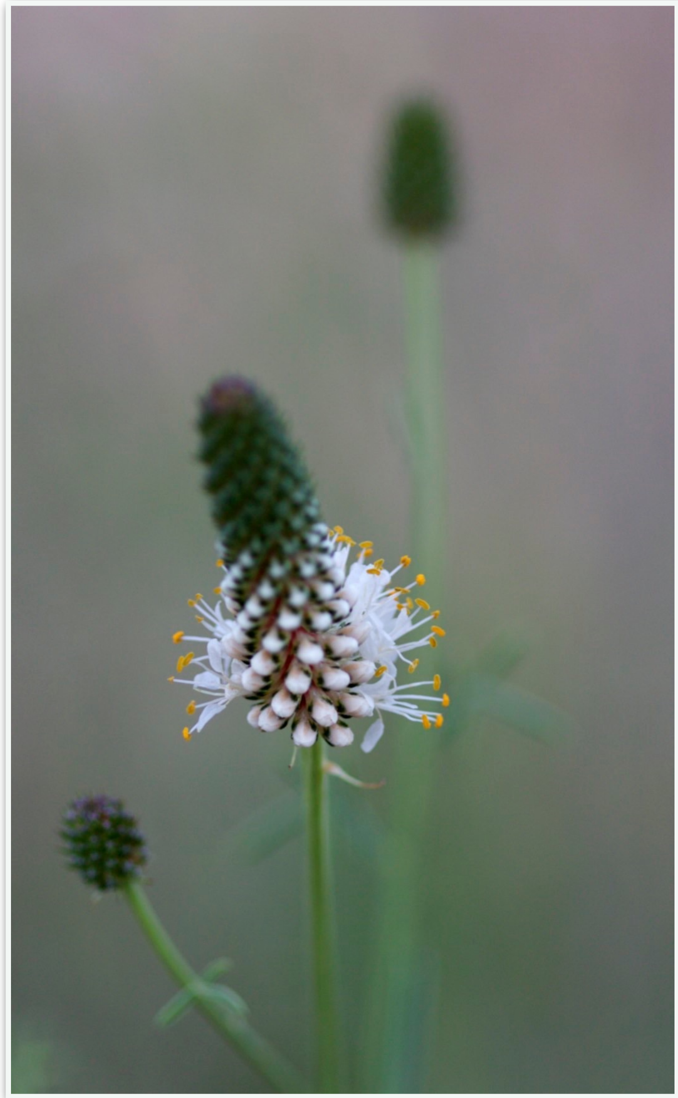

Tribe *Clytini* (Muisant, 1839)

Genus *Megacyllene* (Casey, 1912). There are seven species in this genus in the western United States and Canada. BugGuide notes that "with the exception of *Megacyllene caryae*, the larval hosts of members of *Megacyllene* seem to be restricted to *Fabaceae*."

8. *Megacyllene angulifera* (Casey, 1912). BugGuide lists the host plants for this species as "*Dalea candida,* White Prairie Clover (*Fabaceae*) (see image above), *Maclura pomifera* (*Moraceae*), *Malus* sp. (*Rosaceae*)."

   Kim Score has an iNaturalist observation of this species from southwest of Silver City on 8 October 2021.

   "Meganashford" made the iNaturalist observation of this species, shown here under a Creative Commons license, near Galisteo, New Mexico on 21 September 2024.

9. *Megacyllene antennata* (White, 1855). BugGuide notes that "Eggs are laid in bark crevices of recently cut wood. The larvae feed beneath the bark excavating extensive mines and pushing quantities of frass to the outside through a hole in the bark." Between July and September look for this species on Catclaw Mimosa and Mesquite.

   Jared Shorma took the image shown at the top left of the following page (under a Creative Commons license) in Williamsburg, N.M., on 30 September 2019.

10. *Megacyllene caryae* (Gahan, 1908) Hickory Borer (a.k.a. Painted Hickory Borer). BugGuide notes "univoltine; adults emerge in spring to lay eggs beneath bark scales on logs cut the previous winter; larvae feed for several weeks then bore into

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the sapwood and later the heartwood, and pupate in the fall at the end of larval mine behind a wad of fibrous frass; overwinter as pupae" - from Baker, *Eastern Forest Insects*.

iNaturalist sightings which are "close" to our area include that by Sara Sáenz near Los Pinos in Chihuahua and that by Diego Meneses from El Paso. His observation is shown at the top right under a Creative Commons license.

11. *Megacyllene robiniae* (Forster, 1771)

This species is common where Black Locust, *Robinia pseudoacacia*, has been planted. Although larvae of this species feed on Black Locust they are apparently not attracted to Honey Locust, *Gleditsia triacanthos*, which is an exotic in our area. (This species' relationship, if any, with the New Mexico [Rusby's] Locust, *Robinia rusbyi*, is unknown to the editor. Instead note *Megacyllene robusta*, below.)

This species is often found on species of *Solidago*, goldenrods, feeding on pollen.

BugGuide: "Eggs are laid in the fall. Newly emerged larvae hibernate under bark, tunnel in spring, making tunnels about 10 cm long and 6 mm wide, pupate late Jul/early Aug; adults emerge late Aug-Sep."

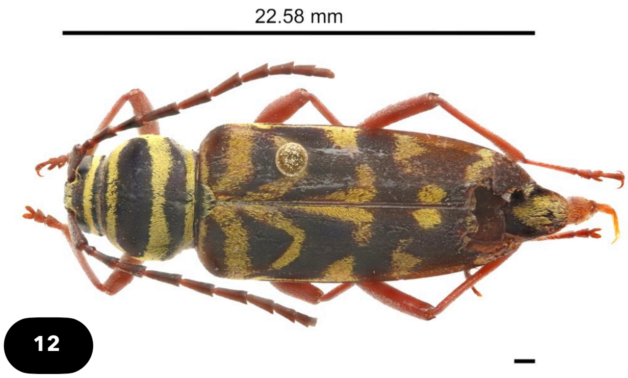
This species is typically active as adults from August to October; note that its bands are all yellow. Compare with *Megacyllene caryae* which has alternating yellow and white bands on the elytra and is active as an adult between March and May.

This image was taken by "roadrunner_38" (iNaturalist) and is shown here under a Creative Commons license. It was taken at Los Lunas, New Mexico on 24 October 2023.

The Mesquite Borer, *Placosternus difficilis*, has not been reported in New Mexico on iNaturalist as of 04 July 2025. It looks similar to this species.

12. *Megacyllene robusta* (Linsley & Chemsak, 1963)

The specimen shown here, via an iNaturalist Creative Commons license, was collected two miles south of Wilcox, Arizona. There are no iNaturalist observations from New Mexico as of 04 July 2025.



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13. *Megacyllene snowi* (Casey, 1912)

Originally described as *Cyllene snowi*.

Laura Gaudette photographed the individual shown here near Clifton, Arizona - near the New Mexico border. There are two subspecies.

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Genus *Neoclytus* (Thompson, 1860) Several species in this genus utilize the the same pheromone component (see this link for details).

14. *Neoclytus acuminatus* (Fabricius, 1775) Red-headed Ash Borer. There are two subspecies; the nominate form has been observed in Santa Teresa. Note the enlarged antenna tips.

An iNaturalist observation by " rsosa4" from El Paso on 24 April 2021, shown here under a Creative Commons license.

Also, a sighting by Bryce DeMers in Las Cruces on 08 April 2025.

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15. *Neoclytus caprea* (Say, 1823) Banded Ash Borer

This iNaturalist observation by "habrinegar" was made on 02 March 2023 near Silver City. It is shown here under a Creative Commons license.

This species is found in the sapwood of a variety of hardwoods including oak and ash. There is one generation per year; larvae feed on sapwood during the summer and pupate in the fall. Adults may emerge in all but the coldest months, anytime from February to November in our area.

16. *Neoclytus irroratus* (LeConte, 1858)

This iNaturalist observation was made by Joe Girgente at Cloudcroft on 17 July 2023. Shown here under a Creative Commons license. The species is included here because sightings "bracket" the Black Range. To the west sightings near Tucson have occurred.

17. *Neoclytus mucronatus vogti* (Fabricius, 1775) Vogt's Spine-rumped Bycid (subspecies: Linsley, 1957)

Joel DuBois' iNaturalist observation was made on the west slope of the Organ Mountains on 15 June 2020. Shown here under a Creative Commons license. The species is included here because sightings "bracket" the Black Range. To the west sightings near Tucson have occurred. Among the larval hosts are Pecan. The adult form season appears to be March to November in our area.

Neoclytus muricatulus (Kirby in Richardson 1837). - an iNaturalist sighting in Albuquerque by James M. Bryant on 23 May 2012.

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18. *Neoclytus tenuiscriptus* (Fall, 1907)

    This iNaturalist sighting by Courtney Christie was made in the Coronado National Forest of southern Arizona on 23 May 2022. It is shown here under a Creative Commons license. There is also an observation on iNaturalist from 04 June 2022 in east Albuquerque by Joshua C'deBaca.

Genus *Placosternus* (Hopping, 1937)

19. *Placosternus erythropus* (Chevrolat, 1835). Feeds on Acacia and Mesquite. This iNaturalist observation by Tony Palmer was made in Pima County, Arizona on 06 October 2018. It is shown here under a Creative Commons license. There are also iNaturalist observations from the Big Bend area of Texas.

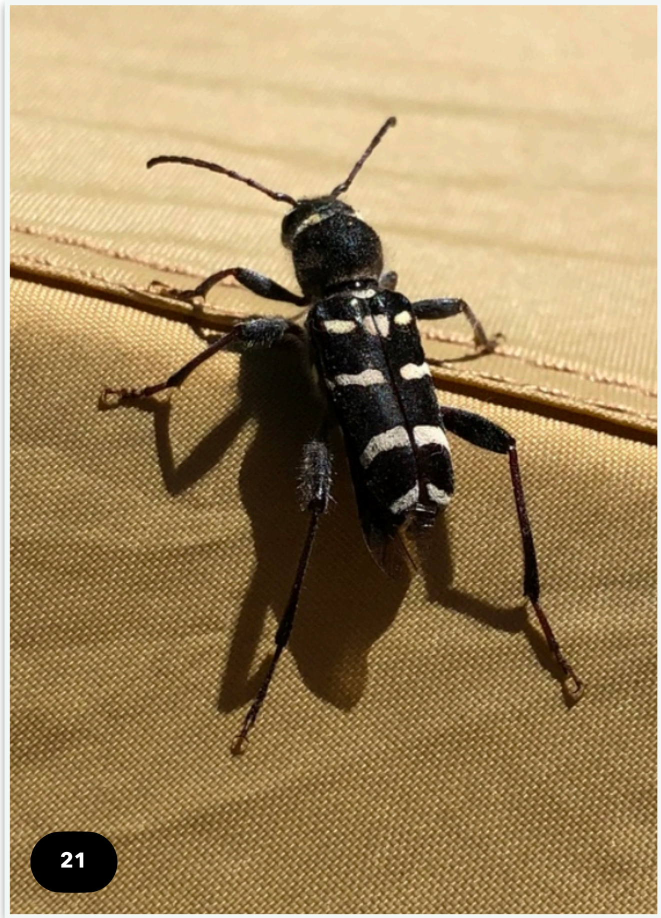
20. *Tylcus hartwegii* (White, 1855, Orig. Comb: *Clytus hartwegii*)

    Another species which "brackets" our area, found in west Texas and southeast Arizona. The specimen shown here is a beetle collected by Mike Quinn on 03 April 2007 in the Davis Mountains of west Texas.

Genus *Xylotrechus* (Chevrolat, 1860). Commonly referred to as "fast moving".

21. *Xylotrechus robustus* (Hopping, 1928)

    This iNaturalist observation was made by "serotiny" in September 2023 near Valles Caldera National Preserve north of Albuquerque.



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Tribe *Compsocerini* (Thomson, 1864). One species in this tribe in Canada and the United States.

Genus *Rosalia* (Audinet-Serville, 1833)

22. *Rosalia funebris* (Motschulsky, 1845) Banded Alder Borer (a.k.a. California Laurel Borer). Broad black and white striping across body. Antenna, which is very long, is also broadly stripped in black and white. The larvae of this species feed on dead hardwood trees (thus the common names).

    See: "Male-produced aggregation pheromone of the cerambycid beetle Rosalia funebris", Ann Ray et al., *Journal of Chemical Ecology*, Jan. 2009.

    "desertlavender" took this image on 27 June 2023 in the Black Range/Mimbres Valley. Shown here under a Creative Commons license.

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Tribe *Eburini* (Blanchard, 1845)

Genus *Eburia* (Lepeletier & Audinet-Serville in Lacordaire, 1830). The raised white marks on the elytra are distinctive.

23. *Eburia (Coeleburia) haldemani* (LeConte, 1850) Ivory-marked Longhorn. Variable in appearance, four ivory spots on its back (eburneous spots) can be very faint or quite distinct (see this iNaturalist observation). The specimen shown here, an observation by "immortalights" on 26 July 2024 from Bernalillo County, is fainter.

    Adult beetles are generally present from May to July. Larva feed on hackberry (*Celtis*), Siberian Elm (*Ulmus*), willow (*Salix*), and juniper (*Juniperus*).

24. ***Eburia (Coeleburia) linsleyi*** **(Lacey, 1949).**

The specimen shown here was observed by George Pollock on 09 August 2023 west of White Signal in Grant County. Season appears to be July to August.

Tribe *Elaphidiini* (Thomson, 1864)

Genus *Aneflomorpha* (Casey, 1912)

25. ***Aneflomorpha cazieri*** **(Chemsak, 1962). BugGuide gives the range of this species as southeastern Arizona to southwestern New Mexico in the United States and within northern Sonora. There are few iNaturalist observations. The one shown here from 25 August 2023 by John Van Veldhuizen was recorded near Green Valley, Arizona. Shown here under a Creative Common s license.**

Aneflomorpha fisheri **(Linsley, 1936). BugGuide gives the range of this species as south and west Texas and New Mexico. As of 06 July 2025 there were no iNaturalist observations and the only observation on BugGuide was by Maury J. Heiman.**

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Aneflomorpha luteicornis (Linsley, 1957). BugGuide gives the range of this species as Arizona and New Mexico. As of 06 July 2025 there are no iNaturalist observations and that on BugGuide is by Steven Lingafelter.

26. *Aneflomorpha paralinearis* (Lingafelter, 2022). By "mike_h", an iNaturalist observation from Gila County, Arizona, on 24 August 2023. Shown here under a Creative Commons license. BugGuide gives the range of this species as Arizona - New Mexico at elevations between 1400 and 2100 meters. The observation shown at the right (26a) was made by Edward L. Ruden on 22 July 2022 in San Miguel County, New Mexico. This individual came to a mercury vapor lamp setup. Once again demonstrating the bracketed effect of observations to both the east and west of our area - but apparently not here. My inclination is that the bracket is a result of a dearth of observation rather than a limitation of range.

27. *Aneflomorpha rectilinea* (Casey, 1924). There are not many observations of this species in the iNaturalist data base (as of 06 July 2025) and those observations bracket our area. For example, the observation shown here is from Felt, Oklahoma, by Ted C. MacRae on 28 July 2023. Shown here under a Creative Commons license. BugGuide has observations of this species from the Organ Mountains (Jim McClarin, 09 August 2006) and many from southern Arizona.

28. *Aneflomorpha tenuis* (LeConte, 1854). The season for this species is typically May to September. *Acacia* sp. have been mentioned as host plants. David Heckard made the iNaturalist observation shown here in July 2022 in the Guadalupe Mountains of southeastern New Mexico.

Aneflomorpha texana (Linsley, 1936). There were no observations of this species on iNaturalist as of 06 July 2025 and only one on BugGuide, by Donald Riley on 23 August 2014 at Fort Davis, Texas. BugGuide gives the range of this species as west Texas to New Mexico.

Genus *Aneflus* (LeConte, 1873). Several species in this genus are found as close as central Arizona; not all have been listed here.

29. *Aneflus levettei* (Casey, 1891 - Orig. Comb: *Elaphidion levettei*) The specimen shown in this iNaturalist observation by "fannysopranny" was recorded west of Portal, Arizona in the Chiricahua Mountains on 01 August 2017.

30. *Aneflus obscurus* (LeConte 1873). An observation on BugGuide from the Double E Ranch in Grant County, on 05 July 2019 by Andrew Meeds, may be viewed at this link. Jairo Uribarri's observation on iNaturalist from the Franklin Mountains (El Paso) on 25 June 2022 may be seen on the following page.

31. *Aneflus prolixus* (LeConte, 1873). Eric Hough's iNaturalist observation, see next page, was made

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on 05 August 2024 in the Apache-Sitgreaves National Forest near the Arizona - New Mexico border.

32. ***Aneflus protensus*** **(LeConte, 1858). Rich Hoyer's observation was made just north of Rodeo, New**

Mexico, on 19 June 2009. It is shown here under a Creative Commons license.

Aneflus sonoranus (Casey, 1924). There are no iNaturalist or BugGuide observations (as of 06 July 2025) of this species in New Mexico. Observations on those sites bracket our area, with observations from California to Texas. See BugGuide and iNaturalist for those observations. This species is found on Catclaw Acacia.

Genus *Anelaphus* (Linsley, 1936)

33. *Anelaphus albofasciatus* (Linell, 1897). David Heckard's observation of 06 April 2024 was made near Carlsbad. Other observations are from southeastern Arizona, thus bracketing our area. Shown here under a Creative Commons license.

34. *Anelaphus brevidens* (Schaeffer, 1908). Lon Brehmer's iNaturalist observation was made northeast of Tucson on 12 April 2013. It is shown here under a Creative Commons license. BugGuide lists the range of this species from the southwest east into west Texas.

35. *Anelaphus magnipunctatus* (Knull, 1934). Some sources challenge this taxonomic determination. The iNaturalist observation shown here under a Creative Commons license was made by "mike_h" on 07 July 2024 just west of Portal, Arizona.

36. *Anelaphus moestus* (LeConte, 1854). Andrew Meeds made the iNaturalist observation shown here under a Creative Commons license just northeast of Las Cruces on 25 June 2018. BugGuide notes that "Larval hosts include: *Juglans, Quercus, Celtis, Rhus*".

37. *Anelaphus piceus* (Chemsak, 1962). Oscar Johnson's observation from southwest of Van Horn, Texas on 29 April 2022 is shown here under a Creative Commons license. It is one of the observations which establishes the bracket of our area (this to the east). There are numerous observations from southern Arizona.

38. *Anelaphus villosus* (Fabricius, 1793) Twig Pruner. This is mostly an eastern species but there is an iNaturalist observation, shown here under a Creative Commons license, in May 2023 from the Guadalupe Mountains by David Heckard.

Genus *Anoplocurius*

39. *Anoplocurius altus* (Knull, 1942). All type specimens have been found on *Quercus* (oaks). As of 07 July 2025 all iNaturalist observations are from north of Phoenix. The one by "mike_h" dates from 24 August 2023 and is shown here under a Creative Commons license. BugGuide indicates our area is bracketed, the species' range extending from Arizona to west Texas.

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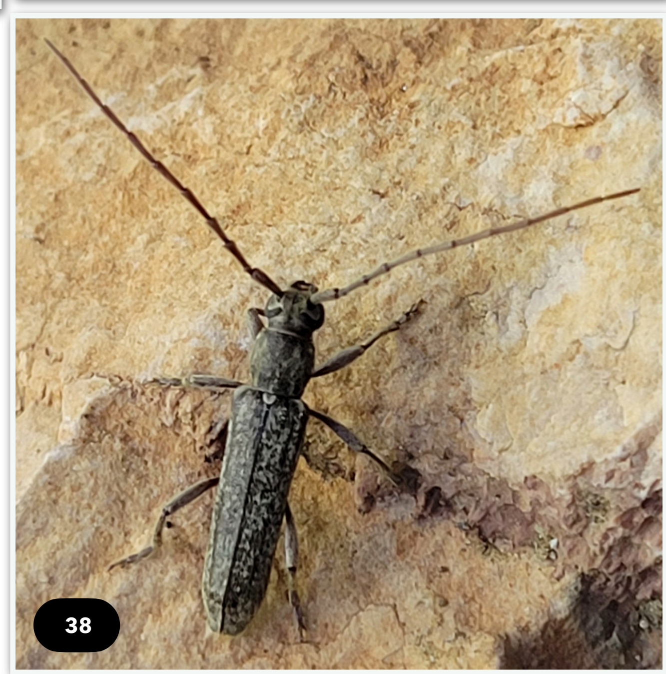

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Genus *Atylostagma* (White, 1853)

40. *Atylostagma politum* (White, 1853). George Pollock's 09 August 2019 iNaturalist observation was made west of White Signal in Grant County. It is shown here under a Creative Commons license. *Atylostagma politum* and *A. glabra* have been found to be synonyms of the same species.

Genus *Elaphidion* (Serville, 1834)

Elaphidion mucronatum (Say, 1823) Spined Oak Borer. This species is primarily a beetle of the east but specimens have been found in southeastern Arizona and on the Mescalero Reservation in the Sacramento Mountains (rachleetort, 03 June 2022). Requires verification.

Genus *Enaphalodes* (Haldeman, 1847)

41. *Enaphalodes atomarius* (Drury, 1773) Robust Oak Borer. "mike_h" made an iNaturalist observation of this species near the crest of the Black Range along NM-152 on 05 July 2024.

42. *Enaphalodes cortiphagus* (Craighead, 1923) Oak-bark Scarrer. BugGuide notes that "Eggs are deposited in bark crevices in the spring. The larvae feed in the bark for 3 years then they bore deeper and excavate a large pupal cell. This cell causes scars on the outer surface of the bark." Wendy McCrady's iNaturalist observation near Gila Hot Springs on 27 July 2022 is shown here under a Creative Commons license.

43. *Enaphalodes hispicornis* (Linnaeus, 1767). Wendy McCrady's iNaturalist observation near Gila Hot Springs on 28 July 2022 is shown here under a Creative Commons license.

44. *Enaphalodes niveitectus* (Schaeffer, 1905 - Orig. Comb: *Romaleum niveitectum*). Mike Quinn's observation on BugGuide was made in Florida Canyon, Santa Rita Mountains, Arizona, on

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29 July 2013. It is shown here under a Creative Commons license.

Enaphalodes rufulus (Haldeman, 1847) Red Oak Borer. This is another eastern species which brackets New Mexico, with specimens being found in Arizona.

45. *Enaphalodes seminitidus* (Horn 1885). BugGuide indicates that the range of this species brackets New Mexico with specimens found in southeastern Arizona (and west of there) to southwest Texas. Dave Barker's observation on BugGuide from north of Del Rio Texas on 26 July 2016 is shown here under a Creative Commons license.

Genus *Eustromula* (LeConte 1858)

46. *Eustromula validum* (LeConte- 1858 - Orig. Comb: *Elaphidion validum*). Andrew Meeds' iNaturalist observation from Gila, New Mexico, on 04 July 2019 is shown here under a Creative Commons license.

Genus *Neaneflus* (Linsley, 1957)

***Neaneflus fuchsii* (Wickham, 1905 - Orig. Comb: *Elaphidion fuchsii*) BugGuide indicates that the range of this species extends from southern California to west Texas, via the Chihuahuan Desert of southeastern New Mexico. iNaturalist and BugGuide observations (as of 07 July 2025) are from California. BugGuide indicates that it "exploits both dead and living plants in the Rosaceae and Solanaceae".**

47. *Neaneflus opacicornis* (Lingafelter, 1957) Lingafelter, 2022 - Originally *Neaneflus opacicornis* (Linsley, 1957 - Orig. Comb: *Aneflomorpha opacicornis*). "mike_h" provides this iNaturalist observation under a Creative Commons license, from Socorro on 30 August 2021.

Genus *Orwellion* (Skiles, 1985)

48. *Orwellion gibbulum arizonense* (Bates, 1880 - Orig. Comb: *Hypermallus gibbulus*) Wendy McCrady's iNaturalist observation near Gila Hot Springs on 22 July 2022 is shown here under a Creative Commons license. This species typically feeds on oaks. This subspecies was originally described as *Elaphidion arizonense* (Casey, 1891).

Genus *Stenelaphus* (Linsley, 1936)

49. *Stenelaphus alienus* (LeConte 1875). BugGuide gives the range of this species as southeastern Arizona and southwestern New Mexico. As of 08 July 2025 all of the iNaturalist and BugGuide observations of this species are from southeastern Arizona. The iNaturalist observation, shown here under a Creative Commons license, by "ck2az", was recorded near Benson on 21 August 2018.

Genus *Stenosphenus* (Haldeman, 1847)

50. *Stenosphenus sobrius* (Newman, 1840 - Orig. Comb: *Elaphidion sobrium*) Mark Gruen's observation on iNaturalist was made in Albuquerque on 21 July 2021, shown here under a Creative Commons license. iNaturalist observations "bracket" our area with observations in northern New Mexico and southeastern Arizona, also to west Texas. This species generally has red legs.

51. *Stenosphenus beyeri* (Schaeffer, 1905). Although BugGuide lists the range of this species as Arizona and New Mexico, all of the observations on that site and on iNaturalist are from southeastern Arizona (as of 08 July 2025). The iNaturalist observation by Yinan Li was made west of Nogales in July 2024.

Tribe *Hesperophanini* (Mulsant, 1839)

Genus *Brothylus* (LeConte, 1859)

52. *Brothylus gemmulatus* (LeConte, 1859). BugGuide notes that "larvae bore into dry solid heartwood of dead oak limbs and small stumps....larvae take 1-2 years to develop." Tom Kennedy made the iNaturalist observation (52) in Tijeras, east of

Albuquerque, on 18 June 2025. It is shown here under a Creative Commons license. Jim Eckert made the BugGuide observation shown here (52a) in Cochise County, Arizona on 18 May 2022. It is shown here with permission.


48


51


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52a

Genus *Eucrossus* (LeConte, 1873)

***Eucrossus villicornis* (LeConte, 1873). BugGuide observations bracket our area.**

Genus *Haplidus* (LeConte, 1873)

53. *Haplidus laticeps* (Knull, 1941) Joel DuBois made the iNaturalist observation, shown here under a Creative Commons license, on 31 March 2020 on Tortugas Mountain, Las Cruces.

54. *Haplidus testaceus* (LeConte, 1873). Ellen Hildebrandt's iNaturalist observation was made during April 2023 south of Albuquerque. It is shown here under a Creative Commons license. Other BugGuide and iNaturalist observations bracket our area.

Genus *Malobidion* (Schaeffer, 1908)

55. *Malobidion brunneum* (Schaeffer, 1908). The iNaturalist observation shown here under a Creative Commons license was made by "mike_h" on 5 July 2024 near the crest of the Black Range along NM-152.

Genus *Tylonotus* (Haldeman, 1847)

56. *Tylonotus bimaculatus* (Haldeman, 1847). Ash and Privet Borer. Primarily an eastern species but our area is bracketed by observations in southeastern Arizona. Jim Eckert's 11 July 2023 iNaturalist observation was made south of Mt. Graham, Arizona. It is shown here under a Creative Commons license. BugGuide notes "Eggs are laid at the base of privet plants and beneath bark scales of ash trees during the early summer. Young larvae

feed in the phloem, later penetrating deeper and scarring the wood. Large branches of ash are usually attacked and killed before the trunk is attacked."

Tribe *Methiini* (Thomson, 1860)

Genus *Methia* (Newman, 1842)

57. *Methia mormona* (Linell, 1897). Cope (Cope, J. [1984], "Notes on the ecology of western *Cerambycidae", Coleopterists Bulletin* 38(1): 27-36) reported that this species has been raised on juniper, walnut, willow, and barberry. Joel DuBois made the iNaturalist observation, shown here under a Creative Commons license, on 25 July 2020, 20 km north of Las Cruces. Other observations in this area include one by George Pollock west of White Signal in Grant County on 30 July 2020.


57

Genus *Styloxus* (LeConte, 1873)

58. *Styloxus bicolor* (Champlain & Knull, 1922 - Orig. Comb: *Idoemea bicolor*) Red-necked Juniper Borer. In "New North American *Coleoptera*" (*Entomological News*, 33[5] 1922, pp. 144-149) A. B. Champlain and J. N. Knull reported that "Larvae prune small branches of juniper, making extensive galleries parallel with the grain of the wood. Infested branches can be recognized by the brown color of the needles." Jim Eckert made the iNaturalist observation shown here. Although BugGuide indicates that the range of this species extends into New Mexico, most of the observations seen online are from southeastern Arizona.


58

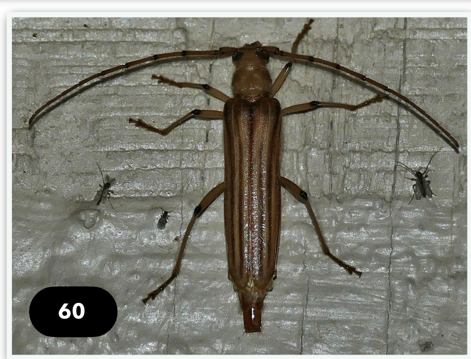
59. *Styloxus fulleri* (Horn, 1880 - Orig. Comb: *Idoemea fulleri*). Observations bracket our area with most being from California and eastern Texas. The observation made by BJ Stacey, shown here under a Creative Commons license, was made on 26 July 2015 south of Sierra Vista, Arizona.


59

Tribe *Oemini* (Lacordaire, 1868)

Genus *Malacopterus* (Audinet-Serville, 1833)

60. *Malacopterus tenellus* (Fabricius, 1801 - Orig. Comb: *Callidium tenellum*). Larvae feed on the dead wood of poplar, hackberry, and willow. Wendy McCrady's iNaturalist observation was made on 23 July 2022 near the Gila Cliff Dwellings National Monument. It is shown here under a Creative Commons license.


60

Genus *Oeme* (Newman, 1840)

61. *Oeme rigida* (Say, 1826). The subspecies *O. r. deserta* is most likely found in our area. Elliott Gordon's observation near Albuquerque, shown here under a Creative Commons license, was made in July 2025 in the Sandia Mountains. There are other observations from southeastern Arizona.

62. *Oeme costata cosata* (LeConte, 1873). Elliott Gordon's observation near Albuquerque, shown here under a Creative Commons license, was made

in May 2024 in the Sandia/Manzanitas Mountains (location obscured). Other observations, in southeastern Arizona, bracket our area.

Tribe *Rhopalophorini* (Blanchard, 1845)

Genus *Rhopalophora* (Audinet-Serville, 1834)

63. *Rhopalophora bicolorella* (Knull, 1934). Joel DuBois made the iNaturalist observation, shown here under a Creative Commons license, on 05 July 2021 near Cloudcroft. This and observations from southeastern Arizona bracket our area.

64. *Rhopalophora meeskei* (Casey, 1891 - Syn: *Rhopalophora longipes meeskei*). The iNaturalist observation by David B. Richman is shown here under a Creative Commons license. He made his observation on 28 July 2009 in Railroad Canyon of the Black Range.

65. *Rhopalophora rugicollis* (LeConte, 1858). This species is found mostly in Mexico. The observation shown here under a Creative Commons license was made by Francisco Farriols Sarabia in Mazatlán. However, there are observations from southeastern Arizona and east Texas, broadly bracketing our area.

Euderces pini (Olivier, 1795). BugGuide indicates that this eastern species may extend into eastern New Mexico.

Tribe *Trachyderini* (Dupont, 1836)

Genus *Aethecerinus* (Fall & Cockerell, 1907)

66. *Aethecerinus latecinctus* (Horn, 1880). This BugGuide observation was made by Bob Barber on 28 July 2014 in Dog Canyon, Otero County. It is shown here under a Creative Commons license. mckcolin posted an iNaturalist observation from near Rincon on 18 July 2023. These and observations from southeastern Arizona bracket our area.

61

Genus *Amannus* (LeConte, 1858)

67. *Amannus vittiger* (LeConte, 1858). This iNaturalist observation was made near Carlsbad by Jacob Simon on 12 August 2021. It is shown here under a creative commons license. This and observations from southeastern Arizona bracket our area.

62

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64

Genus *Batyle* (Thomson, 1864)

68. ***Batyle ignicollis*** **(Say, 1823 - Orig. Comb: *Callidium ignicolle*) Fire-necked Bycid or Fire-necked Longhorn Beetle. This observation, by James Von Loh, was made at the Soledad/Bar Canyons Trailhead on 11 May 2024. The beetle is foraging from the flower of an Apache Plume, *Fallugia paradoxa* (D. Don and Endl.), a tall shrub in the nearby large arroyo. There are three subspecies. This is probably the nominate form but it is also possibly *B. i. oblonga*.**

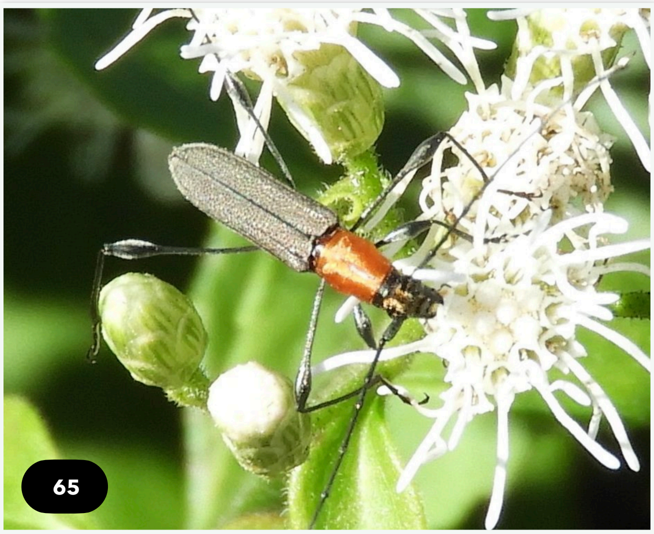
69. ***Batyle suturalis*** **(Say, 1824). Although primarily an eastern species it is found in much of the west. The iNaturalist observation shown here was made at the Bosque del Apache National Wildlife Refuge on 30 June 2023 by "dbugs". It is shown here under a Creative Commons license.**

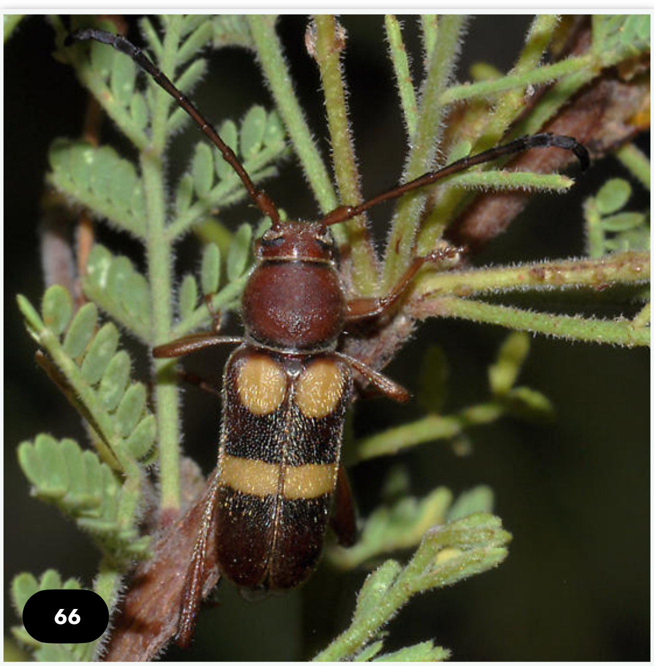
Genus *Crossidius* (LeConte, 1851)

70. ***Crossidius ater*** **(LeConte, 1861). This species is found mostly to the north and west of our area, but there is the possibility.... The iNaturalist observation shown here was made by Grace McCartha on 27 August 2024 near Tierra Amarilla, New Mexico (near Rio Grande del Norte National Monument). It is shown here under a Creative Commons license.**

71. ***Crossidius coralinus*** **(LeConte, 1862) Red and Black Long-horned Beetle. There are many subspecies of this species. Lon Brehmer made the observation shown here at Quemado Lake (south of Quemado) on 29 September 2011. It is shown here under a Creative Commons license.**

72. ***Crossidius discoideus*** **(Say, 1824). There are observations on BugGuide from Quemado Lake, 30 August 2016. There are many other observations on BugGuide and iNaturalist which bracket our area. David Heckard's iNaturalist observation from Eddy County during September 2022 is shown here under a Creative Commons license.**



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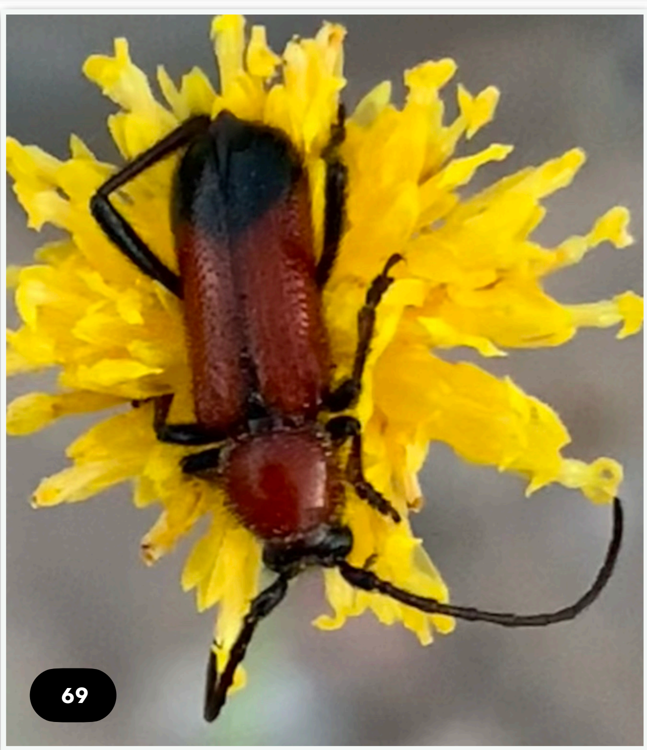
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70

73. *Crossidius pulchellus* (LeConte, 1861). Beautiful Long-horned Beetle. The amount of black on this species is quite variable. It is often found on snakeweed. Andrew Meeds' iNaturalist observation, shown here under a Creative Commons license, was made on 02 September 2018 west of Gila Hot Springs in Grant County.

74. *Crossidius suturalis* (LeConte, 1858). There are six subspecies of *C. suturalis;* only the nominate form is listed from our area by Bezark. Images of this subspecies are shown at this link. This photograph ("74") was made by Gordon Berman (Las Cruces), 24 September 2020. Mike Quinn ("74a") has published a specimen of this subspecies to BugGuide, shown here under a Creative Commons license.

Genus *Elytroleptus* (Dugès, 1879)

75. *Elytroleptus apicalis* (LeConte, 1884 - Orig. Comb: *Pteroplatus apicalis*). There is an iNaturalist observation of this species from the Franklin Mountains by "mckcolin" on 06 July 2021. Nick Ramsey's iNaturalist observation from near Portal, Arizona on 23 July 2019 is shown here under a Creative Commons license.

76. *Elytroleptus immaculipennis* (Knull, 1935 - Orig. Comb: *Elytroleptus floridanus immaculipennis*). Mike Quinn's iNaturalist observation, shown here under a Creative Commons license, is from the Davis Mountains of Texas (where the type specimen for this species was collected) on 17 July 1990. BugGuide indicates that the range of this species extends into Arizona, thus bracketing our area.

77. *Elytroleptus rufipennis* (LeConte, 1884 - Orig. Comb: *Pteroplatus rufipennis*). BugGuide indicates that this species is found and is widely distributed in Mexico. The iNaturalist observation (shown under a Creative Commons license) included here was made in the Sandia Mountains on 08 July 2023 by Joshua C'deBaca. Observations, thus, bracket our area.

Genus *Plionoma* (Casey, 1912)

78. *Plionoma rubens* (Casey, 1891 - Orig. Comb: *Sphaenothecus rubens*). Per BugGuide "The length of the antennae of the males varies considerably, but the lateral punctation of the pronotum and elytra is fine and dense in all of the examples seen by Linsley (1942) . . . Larvae feed on catclaw acacia and other *Fabaceae*." Joel DuBois made an iNaturalist observation of this species on 08 June 2023 in Las Cruces, shown here under a Creative Commons license.

79. *Plionoma suturalis* (LeConte, 1858 - Orig. Comb: *Sphaenothecus suturalis*). Larvae feed on Mesquite wood. Mike Ostrowski made the iNaturalist observation shown here, under a Creative Commons license, on 03 July 2024 in Truth or Consequences.


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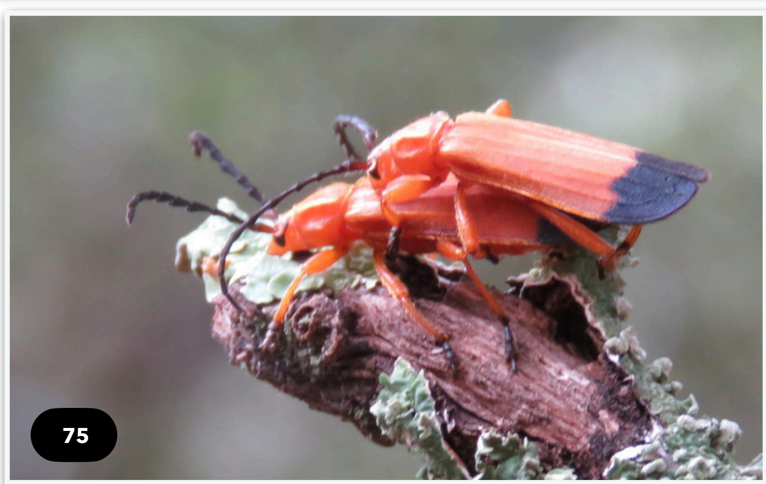
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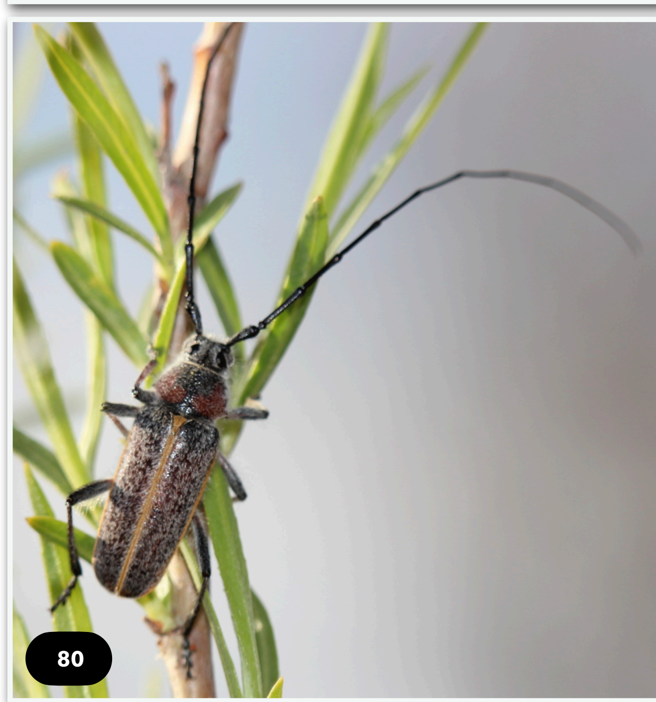

80

Genus *Schizax* (LeConte, 1873)

80. ***Schizax senex* (LeConte, 1873). Specimens have been raised on both Net Leaf Hackberry (*Celtis reticulata*) and Desert Willow (*Chilopsis linearis*). The iNaturalist observation by Joel DuBois in Las Cruces on 22 March 2020 is shown here under a creative commons license.**

Genus *Sphaenothecus* (White, 1853)

81. ***Sphaenothecus bilineatus* (Gory, 1831). Double-banded Bycid. The larval host plants of this species include Honey Mesquite (*Prosopis glandulosa*) and roses. According to BugGuide: "Males position themselves on the highest tips of branches on flowering shrubs or small trees and keep lookout for females. Their long thin antennae wave in the wind. When females arrive, the males are quick to take action and they frequently mate while the females feed." (See original source at the link above.) Laura Gaudette's observation of such an encounter is posted on iNaturalist and is shown here under a Creative Commons license. It was made on 27 August 2015 near City of Rocks State Park.**

Genus *Stenaspis* (Audinet-Serville, 1834)

82. ***Stenaspis solitaria* (Say, 1823). Say's Black Bycid. Often found on Mesquite and Acacia. Apparently they are fond of flying about on hot days. Leslie Flint's iNaturalist observation, shown here under a Creative Commons license, was made at the City of Rocks State Park on 27 August 2015.**

83. ***Stenaspis verticalis* (Audinet-Serville, 1834). There are two subspecies, per BugGuide. *S. v. insignis,* which has a red pronotum, is found in Texas, and *S. v. arizonicus,* which has a dark pronotum, is found in Arizona. As of 12 July 2025 there were no iNaturalist observations of this species. Lon Brehmer made the observation shown here (of *S. v. arizonicus*) under a Creative Commons license on 23 September 2010, northeast of Tucson - showing a dark pronotum. iNaturalist observations of *S. v. insignis*, which tend to be from south central and southeast Texas, show a red pronotum.**

Genus *Dendrobius* (LeConte, 1858)

84. ***Dendrobias mandibularis* (Dupont in Audinet-Serville, 1834) Long-jawed Longhorn Beetle. Larval hosts include willows and hackberry. Observations bracket our area to the east and west. The closest iNaturalist observation (as of 12 July 2025) is from San Simon, Arizona, just north of Portal, by "blacktip". It is shown here under a Creative Commons license.**

Genus *Tragidion* (Audinet-Serville, 1834). BugGuide sees fit to note that "Most species (in this genus) are morphologically similar and hard to identify; species boundaries remain indistinct." See Ted MacRae's blog (Beetles in the Bush) on the identification of species in this genus (*Tragidion confusion* dated 02 February 2009).


81


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85. *Tragidion armatum* (LeConte, 1858). The larvae of this species have been found in dead flower stalks of Yucca and Agave (BugGuide). Observations on iNaturalist which are near Las Cruces include those by matttryc and Katie Goodwin. Jen Schlauch's iNaturalist observation of 05 June 2018, from eastern Socorro County, is shown here under a Creative Commons license.

86. *Tragidion auripenne* (Casey, 1893). BugGuide notes that most observations of this species have been from the Four Corners area. The BugGuide observation shown here under a Creative Commons license was made on 08 September 1991 in the Sandia Mountains by Edward L. Ruden.

87. T*ragidion coquus* (Linnaeus, 1758). Larvae are known to develop on oak and hackberry. The adult season is somewhat later than that of other longhorn beetles, mostly September and October. Matt Becker's observation, shown here under a Creative Commons license, is from the Organ Mountains and was made on 04 July 2023.

88. *Tragidion deceptum* (Swift & Ray, 2008). Per BugGuide: "montane habitats, mostly on oozing desert broom (*Baccharis*) in lower elevations. . . mines the heartwood of recently dead branches of oak." George Pollock's observation, shown here under a Creative Commons license, was made west of White Signal in Grant County, on 31 July 2020. There are other iNaturalist observations from the Organ Mountains by Andrew Meeds.

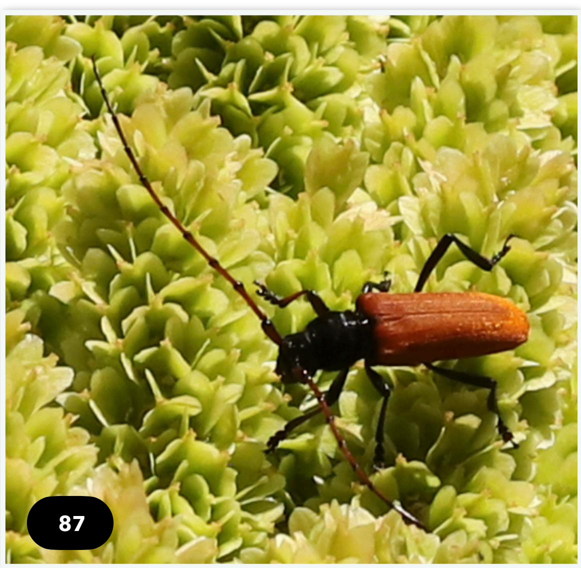
89. *Tragidion densiventre* (Casey, 1912). Per BugGuide this species is typically found in lowland desert habitats. Larvae have been found in the dead branches of Honey Mesquite, *Prosopis glandulosa,* and Catclaw Acacia, *Acacia greggii*. Cecelia Alexander's striking photo of this species is shown here under a Creative Commons license. Her iNaturalist observation was made on 14 September 2013 in the Organ Mountains.

Genus *Tylosis* (LeConte, 1850)

90. *Tylosis jimenezii (*Dugès, 1879). The iNaturalist observation by Joel DuBois in Las Cruces on 09 September 2019 is shown here under a Creative Commons license. As of 13 July 2025 this was the most northerly observation of this species shown on iNaturalist.

91. T*ylosis maculatus* (LeConte, 1850) Spotted Tylosis. This species varies significantly in both its size and the color pattern. The type locality is west of Santa Fe. Host plants for this species include the various mallows of our area. The image shown here was taken by James Von Loh at the Dripping Springs Visitor Center Stormwater Retention Pond (Organ Mountains) on 19 September 2023. It was floating on the pond surface (likely blown down during a strong windstorm) providing forage for many aquatic organisms.


86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92. *Tylosis oculatus* (LeConte, 1850). This species is often found on mallows late in the year (September to December). Tom Kennedy's iNaturalist observation, shown here under a Creative Commons license, was made just north of Socorro on 23 July 2007.

This completes our survey of the longhorn beetles in the subfamily *Cerambycinae*. As indicated at the beginning of this article, there are significant factors which limit our ability to complete a comprehensive survey of those species found in our area. Hopefully, the material shown here will convince you that, although the number of species is daunting and the technical challenges of identification may cause you to give up (or become a professional in the field), it is possible to identify many of these species in hand. And, given the sparsity of observations, your efforts may be significant.

In future issues of this journal, we will delve into the subfamilies *Lamiinae* (Flat-faced Longhorn Beetles), *Lepturinae* (Flower Longhorn Beetles), *Necydalinae, Parandrinae, Prioninae*, and *Spondylidinae* (Members of the subfamily *Disteniinae* are not found in our area.)

Pre-Amber

I sat down beneath a tree recently, it was a warm day in the spring, I was much too tired for what I had been doing, there was a light breeze. A backrest in the form of a Piñon Pine was called for and was convenient.

Once I sat down I was struck by the fact that I had nothing to do. I need something to do. I am not a person who can go to the beach and sit in the sun; that sounds (and is) horrible. But what? Looking at the duff around me I noted the needles, the decaying cones, the gravel, the.... Resin, nodules of resin.

But resin was not enough. No, this was not resin, it was pre-amber. The nodules, two shown below, did not have insects or other items of interest trapped inside. An unfortunate finding because had they been included I would have had an excellent basis for an article about how insects in amber are now revealing more than the taxonomic relationships of old. Something along the lines of, "Fossil Amber Preserves Ecological Interactions between Ancient Ants and Other Organisms", which discusses how amber including more than one species can hint at ancient ecology. That would have been a great article, how pre-amber from the Black Range led to the deep and profound understanding of....

That was not happening, so I held those chunks of pre-amber in my hand and wondered how they would lose the "pre-" of their name. How did resin become amber. The thought experiments which ran through my mind were not satisfying, demanding a bit of literature research.

Wikipedia is often a good starting point for a subject overview. There I learned that there are five classes of amber which are generally defined based on chemical composition, which will vary depending on the tree species the resin came from and a few other things; that amber has a hardness of 2 to 2.5 on the Mohs scale (so scratch it with a fingernail if you wish to deface a work of natural art); that amber melts when heated above 392° F.; and that it has a specific gravity of just over 1, so it will sink in water - but just barely. All very interesting, but I was not getting to what I wanted to know - how does it form.

mindat.org notes that "In order to qualify as 'amber', it is NOT sufficient for a tree resin merely to harden by losing its volatiles. The molecules have to polymerize, which can take millions of years (or at least 100,000 years). After polymerization, amber becomes significantly less soluble in common organic solvents, and so will not become sticky if wetted with alcohol, acetone, or gasoline. Much of the material marketed as 'amber' (especially that from Colombia and Madagascar) is far too young to be considered amber and is in reality just dried tree resin."

The oldest amber dates to the Upper Carboniferous period (320 million years ago).

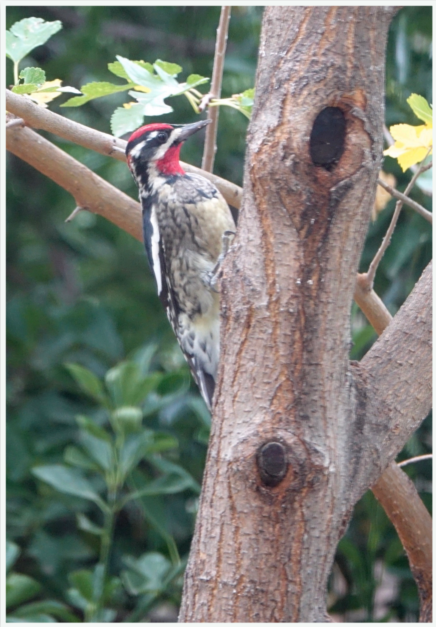
A survey of mining literature did not result in listings of amber from the Black Range. The closest listings were from the San Juan Basin in New Mexico, Alpine in Texas, and Baja. These listings did not include pre-amber at all.

Wikipedia describes the formation of amber in this way: "Molecular polymerization, resulting from high pressures and temperatures produced by overlying sediment, transforms the resin first into copal. Sustained heat and pressure drives off terpenes and results in the formation of amber."

That is an explanation, but I did not "get it", in particular, the emphasis on high pressure. And to be more specific, how were inclusions (insects, for instance) so perfectly preserved if they had been subjected to high pressures. These inclusions are perfect in their three-dimensional form. In some manner, the pressure would seemingly have to be applied on all sides of the pre-amber material evenly. If not, would not the inclusion be distorted? There seemed a bit of logic there, enough when you are lounging under a Piñon Pine. Later, my son who is a former SCUBA diver, pointed out that when diving at more than 30 meters you don't get crushed on one side.

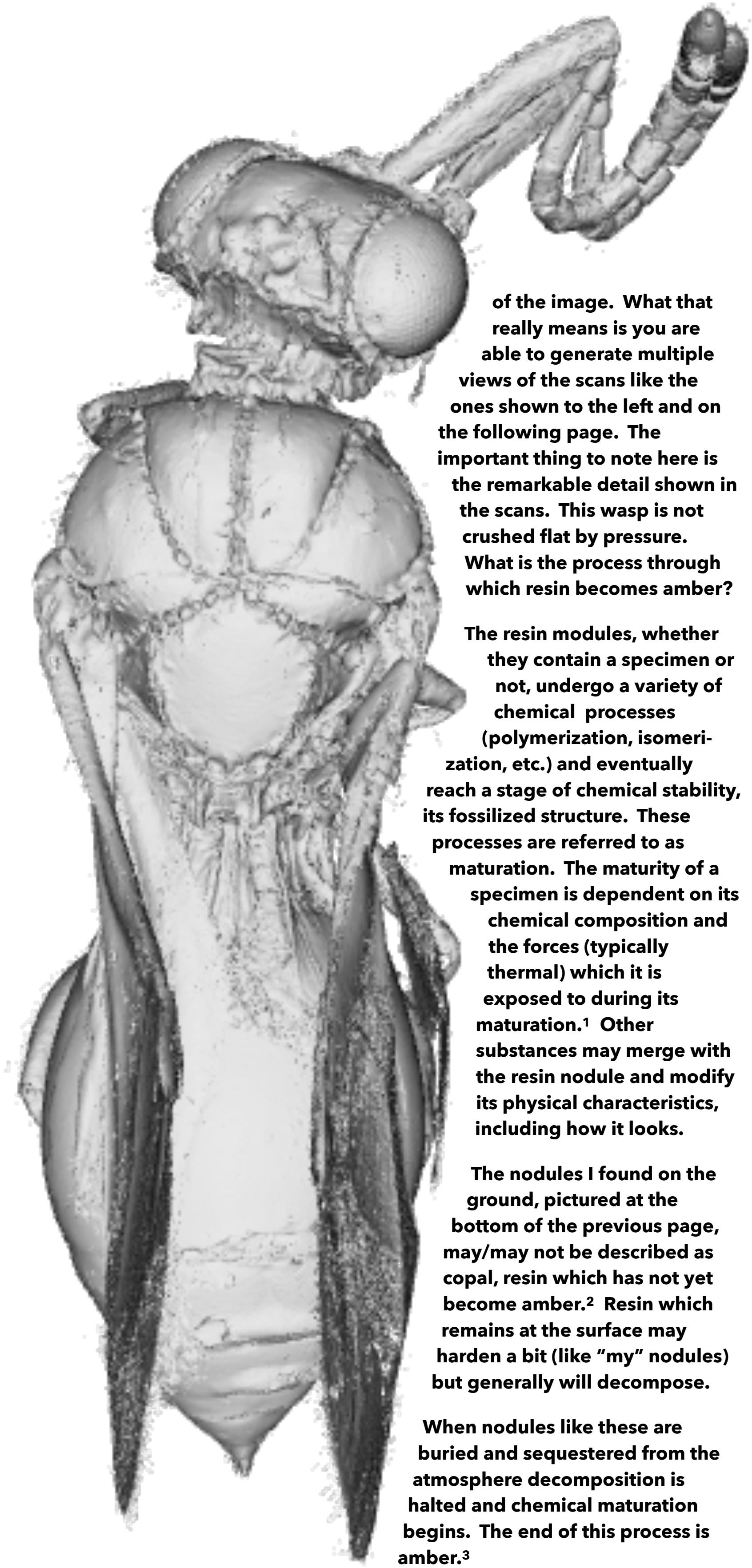
So step by step, how does amber form? First of all, we are not dealing with tree sap. Tree sap does not become amber. The Red-naped Sapsucker, *Sphyrapicus nuchalis,* picture top left on the next page (Hillsboro, November 1, 2016), eats sap, sap that will never be amber.

When a tree is damaged in some way it excretes resin, like that of the Ponderosa Pine at the center left on the next page. Resin is not sap. The resin shown here will congeal and



may be dislodged from the tree. This resin, if it is to be considered "pre-amber" must be resistant to decay. Not a trivial matter. Resin is produced by many trees but it is usually "damaged" by physical and biological processes. "Exposure to sunlight, rain, microorganisms, and extreme temperatures tends to disintegrate the resin."

At some point in this stage of the resin to amber transition an insect may become trapped and engulfed by the resin. Some amber nodules encase insects in remarkable condition. The wasp shown here is an example of this phenomenon. There were many scans of this specimen; the data from these scans were used to create this ParaView Glance image. ParaView allows you to modify the opacity

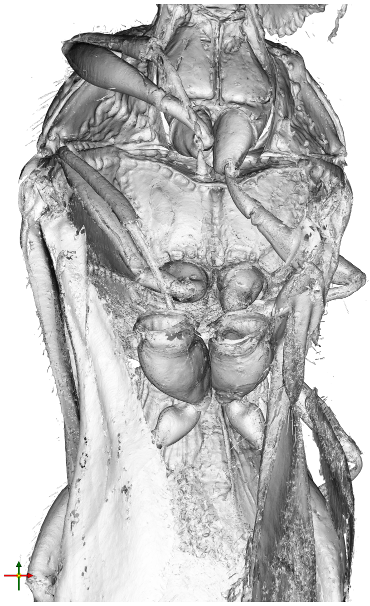


of the image. What that really means is you are able to generate multiple views of the scans like the ones shown to the left and on the following page. The important thing to note here is the remarkable detail shown in the scans. This wasp is not crushed flat by pressure. What is the process through which resin becomes amber?

The resin modules, whether they contain a specimen or not, undergo a variety of chemical processes (polymerization, isomerization, etc.) and eventually reach a stage of chemical stability, its fossilized structure. These processes are referred to as maturation. The maturity of a specimen is dependent on its chemical composition and the forces (typically thermal) which it is exposed to during its maturation.[1] Other substances may merge with the resin nodule and modify its physical characteristics, including how it looks.

The nodules I found on the ground, pictured at the bottom of the previous page, may/may not be described as copal, resin which has not yet become amber.[2] Resin which remains at the surface may harden a bit (like "my" nodules) but generally will decompose.

When nodules like these are buried and sequestered from the atmosphere decomposition is halted and chemical maturation begins. The end of this process is amber.[3]



Chemically, the difference between copal and amber is the amount of polymerization which has occurred and the loss of volatile oils (terpenes). When I smelled the Piñon Pine resin nodules I found I could easily detect that "pine smell". That smell comes from the volatile oils in resin. These oils are lost in the journey from resin to amber - so you can smell amber all day and not detect that "pine smell".

The molecular transformation which happens along the way is significant and alters the physical characteristics of the material. You can see the difference between resin, copal, and amber. Copal and my pine nodules are beautiful but they lack that translucent radiance of amber. If I were to look at them under an ultra-violet light there would be no (or very little) fluorescence. If they had made their journey to become amber they would fluoresces pale blue or green. They would also have a higher melting point (200°C - 380°C) versus something less than 150°C for copal. Amber is completely fossilized and is resistant to organic solvents while copal is semi-fossilized and will become sticky, or even dissolve, in acetone.

See footnote 3 for a discussion of the resin-copal-amber definitions. Note that, if you are linguistically inclined, the matter is complicated by the fact that copal derives from the word *copalli* in Náhuatl. In that language of the Aztecs the term means resin - recently formed resin.

So, following Solórzano-Kraemer et al. (2020)[2,3] the stuff I found under a Piñon Pine is "defaunation resin". That is a term destined to smother any sense of romance associated with leaning up against a pine when you are tired.

As strange as it may seem, this rabbit hole seems to be leading to an answer to the question and thought experiment I formulated under the Piñon Pine. The more I delve into the matter, the active external force involved in polymerization seems not to be pressure but rather thermal action. It is heat. Now, pressure is often used to generate heat, I will grant that, but they are not the same. Strictly from a chemical perspective this makes sense: heat drives many chemical reactions. Pressure, in most cases, is also an indication that the specimen has been effectively sequestered from the atmosphere - but that may make it more difficult for the terpenes to escape.

Furthermore, Solórzano-Kraemer et al. (2020)[2] note that "some resins have the property of polymerizing quite quickly, e.g., *Hymenaea* spp. resin can harden within days", clearly (I posit) the result of chemical action and without pressure.

Saitta and Kaye (2025)[4] note that "Light microscopy suggests that matured resin dries, possibly hardens, and darkens into a brittle, yellow–orange–brown translucent mass with increased luster, exhibiting flow lines, birefringence, conchoidal fracturing, and air pockets typical of copal/amber." They report on their experiments with artificially induced maturation in resins. They used pressure to allow for "controlled" higher temperatures to accelerate the maturation process.

In the end, my understanding of the pre-amber to amber transition was enhanced a bit. Somehow not very satisfying, but noticeable.

In most fossil specimens the fossil was created by a mineralized replacement process. The organic material of the creature was replaced with a mineral of some type. Sometimes this process results in crude, broad-stroke fossils which look like the original but do not have much detail. Sometimes the detail can be very fine. In the formation of amber, the fossilized creature is maintained in fine detail, very fine detail. A work of art. On the following page, there are several examples of copal with insect and other organic inclusions. On their way to becoming amber - or at least they were before they were collected.

If you have the chance to lean up against a pine sometime soon, look around for bits of pre-amber and marvel at what it might become in a few million years, if thousands of things go right for it along the way.

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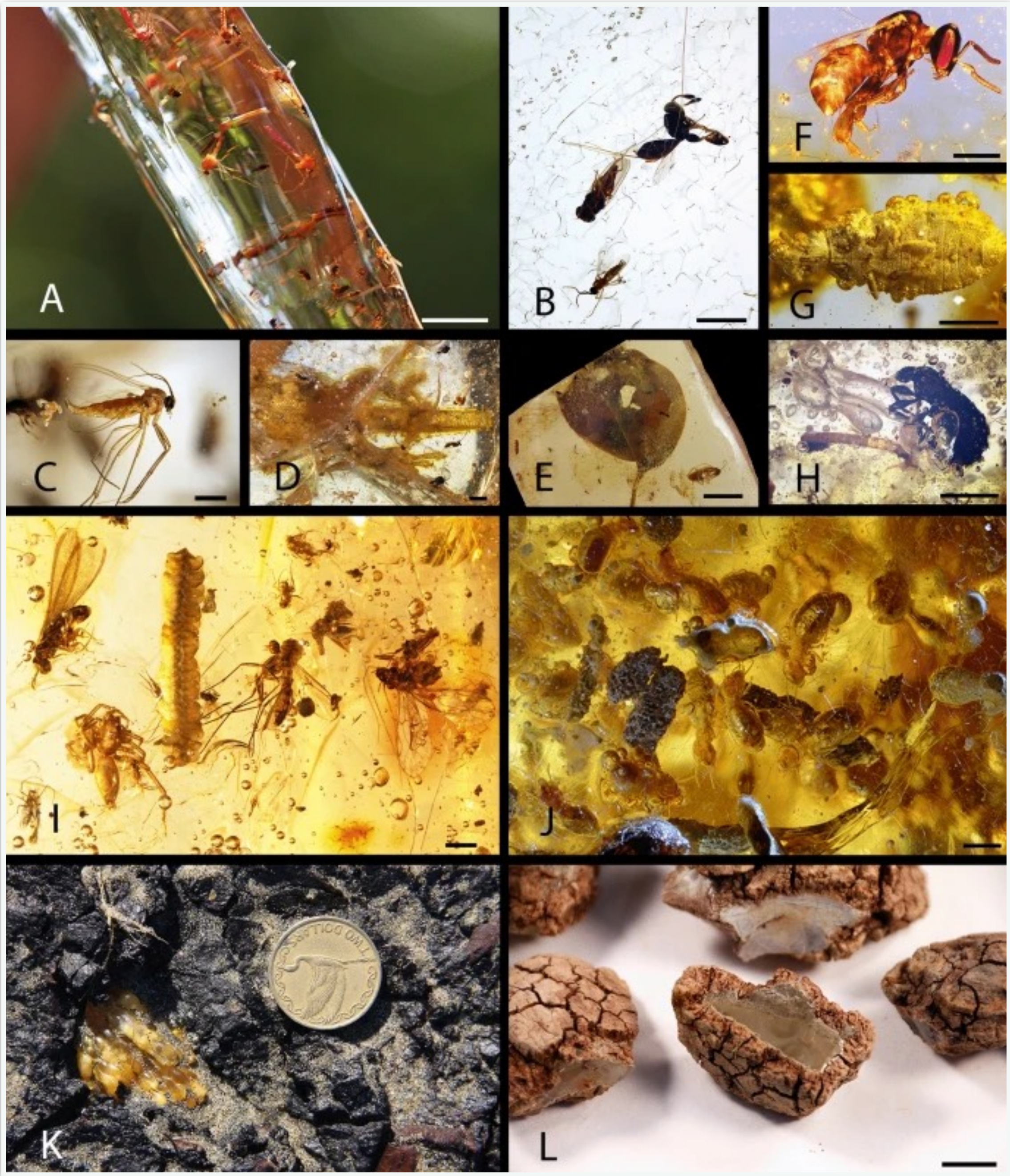
1. Ken Anderson, R. E. Winans, and R. E. Botto, "The Nature and fate of natural resins in the geosphere - II. Identification, classification and nomenclature of resinites", *Organic Geochemistry*, Volume 18, Number 6, pp. 829-841, 1992.
2. Solórzano-Kraemer, M.M., Delclòs, X., Engel, M.S. et al., " A revised definition for copal and its significance for palaeontological and Anthropocene biodiversity-loss studies", *Scientific Reports*, 10, 19904 (2020). https://doi.org/10.1038/s41598-020-76808-6
3. The abstract from "2" above adds significantly to the definitions associated with "amber", "copal", and "resin". It reads:

   "The early fossilization steps of natural resins and associated terminology are a subject of constant debate. Copal and resin are archives of palaeontological and historical information, and their study is critical to the discovery of new and/or recently extinct species and to trace changes in forests during the Holocene. For such studies, a clear, suitable definition for copal is vital and is herein established. We propose an age range for copal (2.58 Ma—1760 AD), including Pleistocene and Holocene copals, and the novel term "Defaunation resin", defined as resin produced after the commencement of the Industrial Revolution. Defaunation resin is differentiated from Holocene copal as it was produced during a period of intense human transformative activities. Additionally, the 'Latest Amber Bioinclusions Gap' (LABG) since the late Miocene to the end of the Pleistocene is hereby newly

defined, and is characterized by its virtual absence of bioinclusions and the consequent lack of palaeontological information, which in part explains the historical differentiation between amber and copal. Crucial time intervals in the study of resin production, and of the biodiversity that could be contained, are now clarified, providing a framework for and focusing future research on bioinclusions preserved in copal and resin."

4. **Saitta, E.T., Kaye, T.G., "Experimental maturation of pine resin in sediment to investigate the formation of synthetic copal and amber", *Scientific Reports*, 15, 7627 (2025), https://doi.org/10.1038/s41598-025-89448-5.**



Bioinclusions in Defaunation resin and Holocene copal from different places. (A–E) Defaunation resin from trees of *Hymenaea verrucosa*, Madagascar. (A) swarm of non-biting midges (*Diptera*: *Chironomidae*). (B) piece containing diverse bioinclusions (*Hymenoptera*: *Chalcidoidea*, *Diptera*: *Brachycera*, and *Diptera*: *Nematocera*: *Sciaridae*). (C) fungus gnat (*Diptera*: *Sciaridae*) that laid eggs during its death. (D) lizard body portion. (E) *H. verrucosa* leaf and different insects as bioinclusions. (F–G) Holocene copal from *H. verrucosa*, Tanzania. (F) stingless bee (*Hymenoptera*: *Apidae*). (G) flat bug (*Hemiptera*: *Aradidae*). (H) Defaunation resin (ca. 200 years old; radiocarbon dating) from tree *Agathis australis,* New Zealand, with different bioinclusions (*Coleoptera* and larva indet.). (I–J) Holocene copal from trees of *Hymenaea courbaril*, Colombia. (I) diverse bioinclusions [*Arachnida*: *Araneae*, *Insecta* (*Psocoptera*, *Isoptera*, *Diptera*), and *Plantae*: *Marchantiophyta*]. (J) termite (*Isoptera*) nest. (K) in situ Pleistocene copal from tree *Agathis australis*, Baylys Beach, New Zealand (coin diameter 26.5 mm). (L) Defaunation resin most probably from trees of *A. lanceolata*, Parc de la Rivière Bleue, New Caledonia. Scale bars: (A) 5 mm, (B–D and F–J) 1 mm, (E and L) 1 cm. (From study cited at footnote 2.)

179. Yellow-bellied Sapsucker

On 10 March 2026, a female Yellow-bellied Sapsucker (*Sphyrapicus varius*) showed up at a yard in Hillsboro, species number 179 on the yard list, and was a regular visitor until later in the month.

This individual often visited a bird bath where a bird cam has been installed. Images from the bird cam are shown in the right column.

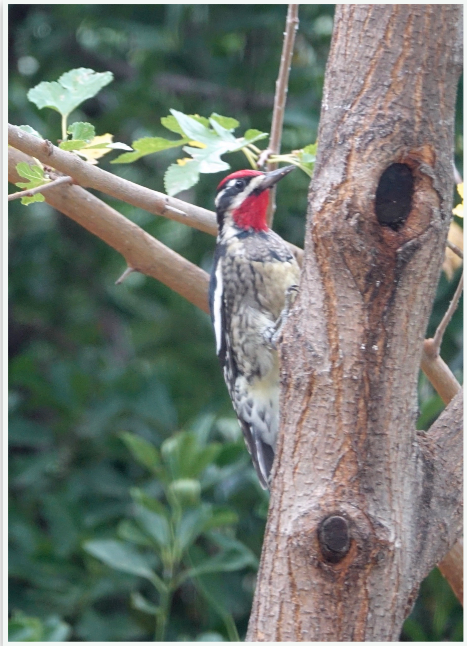
The Yellow-bellied Sapsucker is a member of the Sapsucker super-species in the genus *Sphyrapicus*. The Yellow-bellied, the Red-breasted (*S. ruber)*, and the Red-naped Sapsucker (*S. nuchalis*) species are very closely related. Where the ranges of these species overlap they hybridize freely and the hybrids are often fertile.

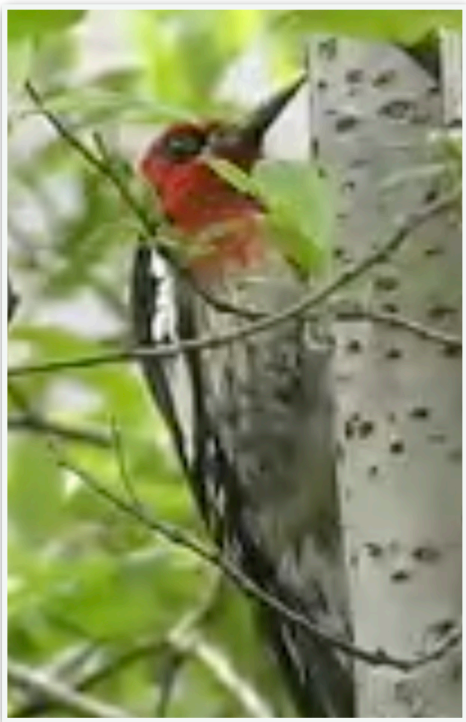
The typical species of this area is the Red-naped Sapsucker (the photo at the top center is from 1 November 2016 in Hillsboro). Compare it to the center photo which is a Red-breasted Sapsucker photographed (video framegrab) north of Hyder, Alaska in July 2003.

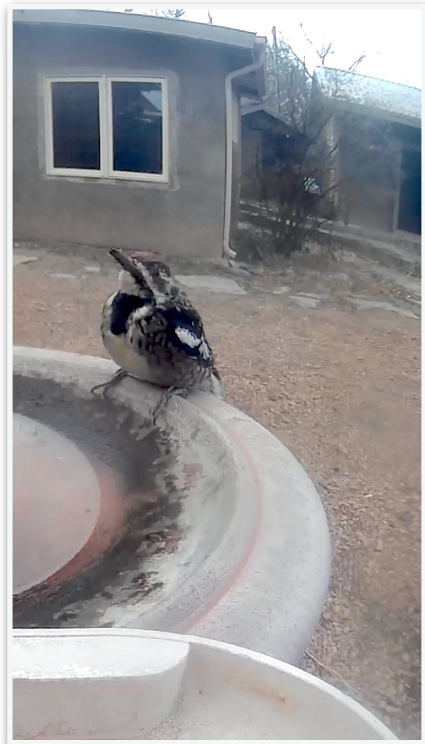
When a sighting of a Red-breasted or a Yellow-bellied Sapsucker is reported in New Mexico flags are immediately raised and the observation is subject to a certain amount of scrutiny. Although the Yellow-bellied Sapsucker's range is sometimes shown as extending up the Rio Grande to about Las Cruces, several sources do not believe that the species' permanent range extends into New Mexico. There are research grade observations of Yellow-bellied Sapsucker from Las Cruces (see Gordon Berman's report from October 30, 2024, for instance).

Williamson's Sapsucker (*Sphyrapicus thyroideus*), shown at the bottom of the center column, is a closely related species - but is not a member of the superspecies. This individual was photographed in Rabb Park on the western slope of the Black Range on 17 November 2020.

Bay Nature's 7 January 2025 article on the superspecies process and species identification issues, by Stephen Shunk, is an excellent resource if you would like to investigate further.







Aquarius remigis, North American Common Water Strider

The North American Common Water Strider is just over a centimeter in length, darts about without warning, and is, thus, difficult to identify in the best of conditions. The creature featured here is *Aquarius remigis*, *the* North American Common Water Strider. *Aquarius remigis* was first described by Say in 1832, although he placed it in the genus Gerris. I photographed the individuals shown at the right on March 4 of this year in Railroad Canyon, on the west slope of the Black Range.

Dolomedes gertschi, New Mexico Fishing Spider, preys on water striders. According to BugGuide its range is restricted to the Gila River drainage in Arizona and New Mexico. The waters of Railroad Canyon are in the Mimbres watershed, which drains into north central Mexico - but not at the surface. Note, however, there are observations of this species of spider from Albuquerque and the Jemez Mountains listed at BugGuide and on iNaturalist from the Mimbres River. It is safe, I think, to state that fishing spiders found in this area will be of this species - by range.

BugGuide lists the following (unattributed) statement: "(*Aquarius remigis*) Faces a conflict when deciding which habitat refuge to use when responding to predators. Predation by sunfish (*Lepomis*) means these bugs need to retreat to the stream banks. But they must move away from those banks when avoiding fishing spiders *Dolomedes*)." Now the stream in Railroad Canyon does not have any sunfish, but it is likely to have some fishing spiders. Something I have yet to observe.

New Videos Added to the Black Range Portfolio

Several new videos have been added to the video portfolios of the Black Range website this year.

For instance, Rock Stars of the Black Range - Sublime Rock Formations - Volume 1 was added to the Follow the Contours video portfolio in March.

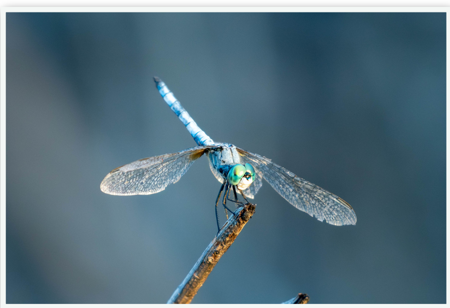
The Black Range is full of dramatic rock formations. This video is the first in (what may become) a video series which embraces their beauty without trying to explain their existence or give them names.

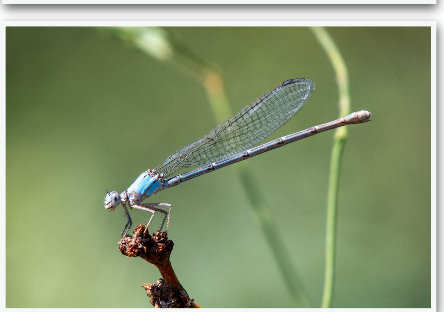
And, road videos for Upper Berenda Creek & Pierce Road and for Cave Creek have been added to the Follow the Contours video portfolio, as well.

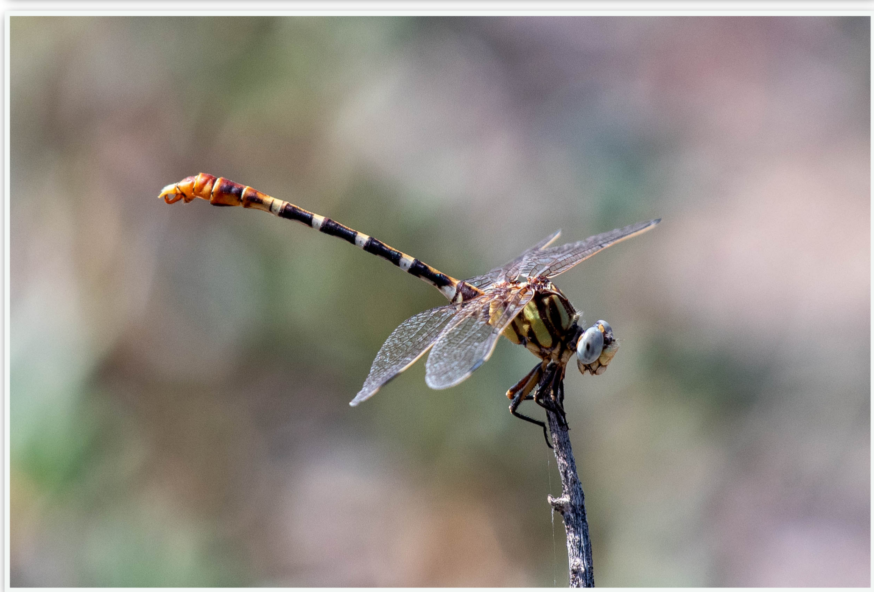
Portraits of Odonata

by Lori Smith

Editor's Note: Lori Smith is a portrait photographer located in Las Cruces. Her website, "[Images by Lori Smith]", showcases multiple examples of her portraiture expertise. Of late, she has been showcasing her skills by photographing dragonflies and damselflies.







THE 11TH ANNUAL

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