

The Black Range Naturalist

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The Covers

The front cover, a Western Diamondback Rattlesnake, was photographed near the confluence of Warm Springs Wash and Percha Creek, just east of Hillsboro, New Mexico.



The back cover, *Boavus idelmani*, found in the Green River Formation from 50 mya.



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Snakes of the Black Range

In this issue, we provide a summary of the snake species found in the Black Range of New Mexico. This material will be integrated into a forthcoming publication on the reptiles of the Black Range. If you encounter mistakes of omission or commission, please let us know so that future issuances can be as accurate as possible.

As with the rest of the natural world, any inquiry into the realm of snakes reveals more than a little mythology, lots of knowledge gaps, and many areas of understanding which are unlikely to stand the test of time. Herpetology in general and ophiology (the study of snakes) specifically have to address the common issues associated with the making of the sausage called "science": a fact today may not be a fact tomorrow. There are some who perceive this as a weakness. To these individuals the world is black or white. There is no room for nuance, there is only the truth. The shortcomings of their mythology are legendary. Others recognize that science is a formative process, one which builds on the knowledge of the past to better the knowledge of the present, recognizing that it will never be complete or perfect, only (hopefully) continually better. False steps happen, human failings shroud "the truth", and the world continues to change. Throughout this issue we will try to point you to a variety of sources which may be of use to you as you attempt to deepen you understanding of this topic. Trouble is, not all of those sources agree on some of the basics, like what to call something or what its relationship is to others. Sometimes lack of consistency results from a fundamental disagreement about the facts and/or how to interpret them. Sometimes the lack of consistency is simply the result of a lot of people trying to keep up to date on the latest thinking but failing to do so. Or, just as likely, knowing the change but simply not having the time or resource to change the reference material.

We present what we believe to be the latest information in this issue. We may even have gotten that right. If you have a deep interest in this topic, please follow the resources we point you to. A document like this journal can tend to be static. We try to update material we present as new issues are published, and we index our material thoroughly. If you pick up this issue, and go to no other source, remember that knowledge is fluid and what is presented here is the river you stepped in when this issue hit the ether, not the river you stepped into a week later, even though it had the same GPS coordinate.

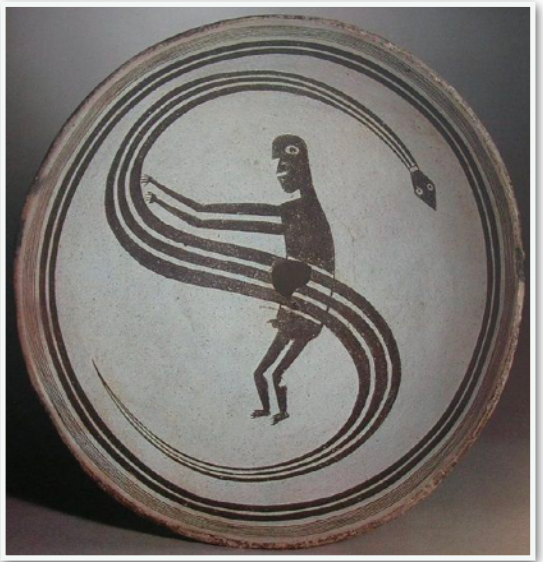
Snakes have been of interest to the people of the Black Range for thousands of years. The petroglyphs of rattlesnakes and the images on Mimbres pottery are simply two reminders of this fact.

Remember, many snake species are venomous and some have very toxic venom. Don't be afraid, be aware.





Rattlesnake glyph at the Pony Hills glyph site southeast of Cooke's Peak. Mimbres culture.





Snakes of the Black Range - Species Listing

The current USDA, Forest Service checklist for the Gila lists several of the following snakes. The Forest Service checklist does not indicate subspecies. The following listing brings the Forest Service checklist up to date. We lead with the species name as it appears in the above checklist in most cases. However, if there appears to be agreement that the species should be known by a separate name we substitute the new name for that found on the checklist. The taxonomy of these species is not always universally agreed to; we try to explain the possibilities, but it can be quite confusing.

References to "checklist" refer to the USFS checklist linked to above. "NMHS" refers to the New Mexico Herpetological Society website. The Reptiles and Amphibians of Arizona website is an additional useful resource. "NAFHA" refers to the listing of species of the snakes of North America maintained by the North America Field Herping Association.

The NMHS website lists several species for Sierra and Grant County; they are included in the following listing but are not included on the USFS checklist.

If you know of other species found in the area, please let the editor (rabarnes@blackrange.org) know.

Alphabetical Listing by Latin Binomial (Genus)

***Arizona elegans philipi*, Painted Desert Glossy Snake. This species is not listed on the USFS checklist but is listed on the NMHS website. NAFHA lists eight subspecies of *A. elegans*, Glossy Snake.**

***Bogertophis subocularis subocularis*, Northern Trans-Pecos Ratsnake. This species is not listed on the USFS checklist but is listed on the NMHS website.**

***Crotalus atrox*, Western Diamond-backed Rattlesnake. This is the rattlesnake which is most likely to be encountered in the Black Range. It is common in desert, oak woodland, and oak-juniper woodland. There are no subspecies of Western Diamond-backed Rattlesnake.**

***Crotalus lepidus*, Rock Rattlesnake. This species is uncommon in oak-juniper, pinyon-juniper, and Ponderosa Pine woodlands. There are four recognized subspecies of Rock Rattlesnake. The one found in our area is the Banded Rock Rattlesnake, *C. l. klauberi*.**

***Crotalus molossus*, Northern Black-tailed Rattlesnake. *C. molossus*, as listed in the USFS checklist, has been split into two species. *C. molossus* and *C. ornatus*. This species is found to the northwest of the Black Range and may possibly extend into the Black Range. There are three subspecies of *C. molossus*. The one found in our area is the nominate form, *C. m. molossus*.**

***Crotalus ornatus*, Ornate Black-tailed Rattlesnake. This species is common in oak-juniper, pinyon-juniper, Ponderosa Pine, and spruce-fir woodlands. Several sources have yet to accept these snakes as a full species. See the write-up in the species description.**

***Crotalus viridis*, *Prairie Rattlesnake*. Common in desert, oak woodland, oak-juniper, pinyon-juniper, and Ponderosa Pine woodlands.**

***Diadophis punctatus regalis*, Regal Ringneck Snake. This species is not listed on the USFS checklist but is listed on the NMHS website. NAFHA lists 14 subspecies of *D. punctatus*. This is a species of rocky hillsides, grasslands, and forest edges.**

***Gyalopion canum*, Chihuahuan Hook-nosed Snake. Not listed on the USFS checklist, but see NMHS.**

***Heterodon kennerlyi*, Mexican Hog-nosed Snake. Not listed on the checklist but is listed at the NMHS website.**

***Heterodon nasicus*, Plains Hog-nosed Snake. Not listed on the USFS checklist, but see NMHS, which lists this species for Sierra County.**

***Hypsiglena jani*, Chihuahuan Night Snake. This species is not listed on the USFS checklist, but see NMHS.**

***Lampropeltis pyromelana pyromelana*, Sonora Mountain Kingsnake. There are two subspecies of Sonoran Mountain Kingsnake; the nominate form is found in our area. Our subspecies is sometimes known as the Arizona Mountain Kingsnake. Uncommon in pinyon-juniper, Ponderosa Pine, and spruce-fir woodlands.**

***Lampropeltis splendida*, Desert Kingsnake. This species is listed as *L. getulus,* the Common Kingsnake, in the USFS checklist. Since publication of that checklist, the specific name of the Common Kingsnake was changed to *Lampropeltis getula*. The snake found in our area is now recognized as a full species, *L. splendida*, the Desert Kingsnake. This species is uncommon in our area, typically found in oak, oak-juniper, and pinyon-juniper woodlands.**

***Lampropeltis triangulum*, Milksnake. This species is not listed on the USFS checklist, but see the NMHS website. Although it is not found in Sierra or Grant County, it is is found in four counties which abut them. Additional survey work is in order.**

***Masticophis bilineatus*, Sonoran Whipsnake. This species is not listed on the checklist, but see NMHS. NMHS indicates the range of this species includes Grant County.**

***Masticophis flagellum*, Coachwhip. Some authorities place these snakes within the genus *Coluber*, in which case it is *Coluber flagellum testaceus,* the Western Coachwhip. NMHS lists two subspecies in our area: *M. f. testaceus* (from Sierra County) and *M. f. lineatulus* (from Grant County). Common in oak and oak-juniper woodlands.**

***Masticophis taeniatus taeniatus*, Desert Striped Whipsnake. Some authorities place these snakes within the genus *Coluber*, in which case it is *Coluber taeniatus taeniatus*. This species is common in oak-juniper and pinyon-juniper woodlands.**

Micruroides euryxanthus, Arizona Coral Snake. This species is also known as the Sonoran Coralsnake. The NMHS site indicates that this species is found in Grant but not Sierra County. This species is rare in oak-juniper and pinyon-juniper woodlands.

Pantherophis emoryi, Great Plains Rat Snake. Not listed on the USFS checklist, but see NMHS. NMHS indicates the range of this species includes Sierra County.

Pituophis catenifer affinis, Sonoran Gopher Snake. Not listed on the checklist, but see NMHS. The "Bull Snake" entry on the USFS checklist (see below) probably refers to this species. NAFHA lists ten subspecies of *Pituophis catenifer*.

Pituophis melanoleucus, Bull Snake. (The current common name for this species is Pine Snake.) The Pine Snake is a species of the American southeast. The common name of Bull Snake is used for *Pituophis catenifer sayi,* which is found in the New Mexico counties bordering Texas in the north. Changes in taxonomic determinations have also contributed to the confusion.

Rena dulcis, New Mexico Blind Snake. The USFS checklist includes *Leptotyphlops dulcis*, Texas Blind Snake. Please see the species account to review how we got from *L. dulcis* to *R. dulcis*. (It was not a straight road.) This species is rare in our area, where it is typically found in oak-juniper and pinyon-juniper woodlands.

Rena segrega, Trans-Pecos Blindsnake. *Leptotyphlops humilis*, Western Blind Snake is listed in the USFS checklist. Please see the species account to review how we got from *L. humilis* to *R. segrega*. This species is uncommon in oak, oak-juniper, and pinyon-juniper woodlands.

Rhinocheilus lecontei, Western Long-nosed Snake. Not listed on the USFS checklist, but see the NMHS website.

Salvadora deserticola, Big Bend Patchnose Snake. The USFS checklist lists these snakes as *Salvadora deserticola*, Western Patchnose Snake. NAFHA lists five subspecies of *S. hexalepis*, the Western Patchnose Snake, one of which is *S. h. deserticola*. NHMS lists this species simply as *Salvadora hexalepis*, the Western Patchnose Snake. This species is fairly common in oak and oak-juniper woodlands. In the Hillsboro area, this species is most commonly found in the desert washes.

Salvadora grahamiae grahamiae, Mountain Patchnose Snake. NAFHA lists two subspecies of *S. grahamiae*. Eastern Patchnose Snake, the nominate form is found in our area and is known as the Mountain Patchnose. This species is uncommon and is typically found in pinyon-juniper woodlands.

Sistrurus tergeminus edwardsi, Desert Massasauga (following NMHS). Not listed on the USFS checklist, but see NMHS. NAFHA lists this group of snakes as a subspecies of *Sistrurus catenatus (edwardsii)*. It also lists a species named *S. c. tergeminus*, Western Massasauga. A few individuals of this species have been found in the grasslands around the Black Range.

Sonora semiannulata semiannulata, (Variable) Ground Snake. Not listed on the USFS checklist, but see NMHS.

Tantilla hobartsmithi, Southwestern Black-headed Snake. This species is also known as Smith's Black-headed Snake. It is rare in our area and is found in the desert, oak, and oak-juniper woodlands.

Tantilla nigriceps, Plains Black-headed Snake. Uncommon in desert, oak, oak-juniper, and pinyon-juniper woodlands.

Thamnophis cyrtopsis cyrtopsis, Black-necked Garter Snake. This species is common in deciduous riparian areas.

Thamnophis elegans vagrans, Western Terrestrial Garter Snake (subspecies is referred to as the Wandering Gartersnake). Other English common names include Garden Snake, Gardener Snake, and Grass Snake. This species is common in deciduous riparian and coniferous riparian woodlands. NAFHA lists four subspecies of Terrestrial Garter Snake, others list six.



Sonoran Gopher Snake, Hillsboro, New Mexico, May 1, 2011

Thamnophis eques, Mexican Garter Snake. Not listed on the checklist, but see NMHS which lists this species from Grant County (but probably not from the Black Range).

Thamnophis marcianus marcianus, Checkered Garter Snake. The subspecies is known as Marcy's Checkered Garter Snake. Fairly common in deciduous riparian woodlands.

Thamnophis rufipunctatus, Narrow-headed Garter Snake. NMHS lists this species for Grant but not Sierra County. This species is uncommon in open marshes and deciduous riparian woodlands.

Thamnophis sirtalis, Common Garter Snake. Not listed on the USFS checklist, but see NMHS. NMHS indicates that the range of this species includes Sierra County.

Trimorphodon lambda, Sonoran Lyre Snake. Not listed on the USFS checklist, but see NMHS. NMHS indicates the range of this species includes Grant County.

Trimorphodon vilkinsonii, Chihuahuan Lyre Snake. Not listed on the checklist, but see NMHS. NMHS indicates the range of this species includes Sierra County.

Snakes of the Black Range - Species Accounts

The following species accounts are arranged in alphabetical order by Latin binomial.

Painted Desert Glossy Snake

Arizona elegans philipi

This species is not listed on the USFS checklist but is listed at NMHS (follow link above). NAFHA lists eight subspecies of *A. elegans,* Glossy Snake. One other subspecies is found in New Mexico and two others are found in Arizona. This subspecies has been found in most of the counties of central and western New Mexico.



The image to the upper right is provided by nmoorhatch, via iNaturalist, under a Creative Commons license. The photograph was taken near El Paso. Note that the coloration of this species will vary with the color of the soil in its native range.



This species is typically found at elevations below 6,000' in desert scrub and grasslands. It is one of the constrictor species and feeds on other snakes, lizards, birds, and small mammals. The Painted Desert Glossy Snake is nocturnal but may sometimes be found during the daylight hours during cool mornings and afternoons.

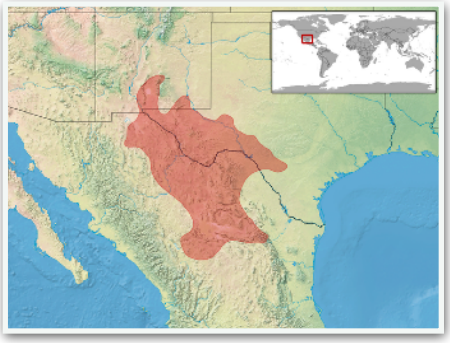
This species is oviparous (egg laying) and breeds in late spring to early summer. From 10 to 20 eggs are in a clutch.

Northern Trans-Pecos Rat Snake

Bogertophis subocularis subocularis

This species is not listed on the USFS checklist but is listed at NMHS (follow link above) for Sierra County. However, note the range map to the right for this species, provided by rbrausse under a Creative Commons license. It may be doubtful that this species is found in the Black Range. There are two subspecies, a "Northern" and a "Southern".

The "H" markings along its top are diagnostic, so this species should be fairly easy to identify if encountered. The individual directly above was photographed by Richard D. Reams and is shown here via iNaturalist/CC license.



The Northern Trans-Pecos Rat Snake is typically found in rocky areas with deep cracks in the rock. Such cracks are their preferred areas of hibernation.

The Rattlesnakes

"Rattlers of the Black Range", by Randall Gray, was published in the very first issue of this journal. In that article, Gray noted that "eight rattlesnakes are now recognized to occur in New Mexico. Four, and just maybe six species of rattlesnakes call the Black Range home." The full text of Randy Gray's article is reprinted below because it has a wealth of information. (Photographs associated with the article are included in the species pages of this article).

"The most maligned, misunderstood and feared residents of the Black Range are rattlesnakes. However, they are a fascinating group of reptiles that we are still learning more about. For instance, in the past couple of years researchers have documented that female rattlesnakes after giving live birth, stay with their offspring and help protect them along with other social behaviors.

"There are eight species of rattlesnakes now recognized to occur in New Mexico. Four, and just maybe six species of rattlesnakes call the Black Range home. The most often seen is the Western Diamondback (*Crotalus atrox*) easily recognized by its boldly alternating pattern of white and black bands on the tail. Also found in the Range is the Ornate Black-tailed Rattlesnake (*Crotalus ornatus*) whose name "black-tailed" is a good way to identify the species. The Banded Rock Rattlesnake (*Crotalus lepidus*) is not seen as often as the Diamondback or Ornate Black-tailed. It makes its home in rocky areas where it feeds primarily upon lizards. Another common rattlesnake in the Black Range at lower elevations is the Prairie Rattlesnake (*Crotalus viridis*). The fifth rattlesnake that just might be found in some of the lower elevation drainages is the Massasauga (*Sistrurus catenatus*) because a few have been found in the grasslands around the Black Range. The possible sixth species is the Northern Black-tailed Rattlesnake (*Crotalus molossus*) which might occur on the western slopes of the Black Range. However, you might need some DNA to be sure. Several years ago the Black-tailed Rattlesnake (*Crotalus molossus*) was broken into two (*Crotalus molossus* and *Crotalus ornatus*). The western distribution of the Ornate Black-tailed Rattlesnake was proposed as the southern end of the Black Range. As taxonomy goes, those two snakes may be lumped back together someday.

"The Ornate Black-tailed, Western Diamondback and Prairie Rattlesnakes are the species most often encountered crossing roads. Unfortunately they often linger on the roads to absorb the heat radiated by the asphalt which raises the chances they will be hit by a vehicle. Sightings are especially common during the monsoons when they are moving around looking for mates. They give live birth the following summer and most breed only every two years.

"There are several common misunderstandings about our rattlesnake residents that are often voiced. First is who's who. Many folks think we have Timber Rattlesnakes (*Crotalus horridus*) in the Black Range. However we don't; the closest populations of Timber Rattlesnakes are in East Texas. The Ornate Black-tailed is the species most often misidentified as a Timber Rattlesnake. You will also hear people say there are Mojave "Green" Rattlesnakes (*Crotalus scutulatus*) in the area. The only documented Mojave Rattlesnakes are in the boot heel of New Mexico just west of Animas and in south central New Mexico along the border with Texas. Some populations of Mojave Rattlesnakes have a green phase as is also the case with Northern Black-tailed rattlesnakes, so maybe seeing a greenish Black-tailed leads to the mistaken conclusion that it is a Mojave.

"Many think you can tell the age of a rattlesnake by the number of buttons on its rattle. This is not reliable because rattlesnakes gain a button (rattle) every time they shed. If the snake is eating well it can shed several times a year. In addition, buttons can be broken off, so they come and go more frequently than assumed.

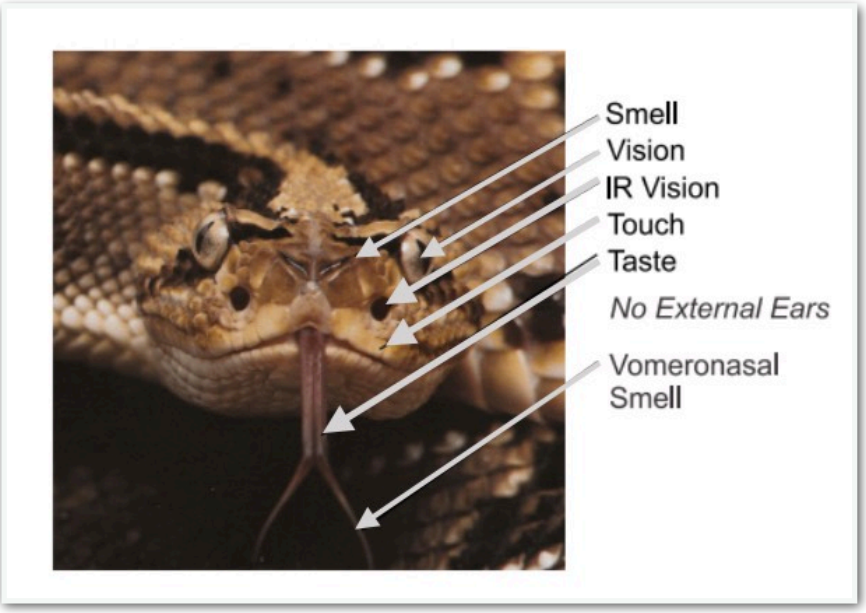
"Another misunderstanding is that baby rattlesnakes are more deadly. A reason cited is they cannot control the amount of venom injected. However, the bite from a larger rattlesnake is more serious because larger snakes have more venom. However, the best course is to not find out! Avoid being bitten by being mindful of where you put your hands or where you walk when out and about. Rattlesnakes prefer not to interact with you and often rattle to warn of their presence. But sometimes they don't rattle so look for them.

"There is a group, Advocates for Snake Preservation, that is based just west of the Black Range in Silver City, NM that does outreach about snakes. Their web site (www.snakes.ngo) has information about living with rattlesnakes as well as videos showing the social behavior of rattlesnakes.

Rattlesnakes are part of the great biodiversity of the world and are unique residents of the Black Range. They are are a part of the ecology of this remarkable area. More people have learned to respect and appreciate rattlesnakes and avoid killing them. In fact, don't be surprised if you pass somebody on the road that has stopped to move a rattlesnake before it is intentionally or otherwise run over."

In the January 2020 issue of this journal, Randy Gray reported that he was assisting others in a genetic study of the speciation questions surrounding the Black-tailed Rattlesnake complex. In personal correspondence with the editor on November 11, 2019, he noted that "I have been collecting blood of *C. ornatus* for DNA analysis to further determine genotype comparison with *molossus*. The researchers are collecting samples from within the integration zone which occurs from our neighborhood to AZ. I have photographed specimens from the bootheel that are visually very *C. molossus*. I believe the specimens identified near Gila Cliff Dwellings are most likely *C. molossus* based on a documented find by one of the researchers if I remember correctly (but note that snake is still being reviewed). However there is still much to learn and we live where the now 2 species come together… though the Mimbres River is indicated as a potential barrier I do not understand that. Water does not stop rattlesnakes."

In the second issue of this journal, Lloyd Barr published "A Rattlesnake's World" which described the umwelt of rattlesnakes, what they sense and how they sense it. As above, we reprint the article here.



"All an animal 'knows' about the world comes to it via its senses. So to learn something of what a snake's world is like, we need to learn something about the way they sense the external world.

Imagine, you are standing on the side of a dry creek bed watching a Texas Horned Lizard, what kids call horny toads, when ten feet away, a snake slides out from the grass under a mesquite tree and starts across the creek bed. It is "clearly intent" on going straight across and seems to bustle as it creates its sinusoidal way across the sandy, rocky, terrain. You freeze! The snake is big, more than four feet long and has a thick body, more than two inches thick. No need to attract its attention! It is moving so fast it is hard to see the dark brown diamond patterns on the skin of its back. The rest of its skin is blotchy, mottled skin, light, tan even. However, it has a rattle on its tail and just ahead of the rattle are the bright, characteristic black and white stripes of the "coon tail". Definitely a Western Diamondback Rattlesnake. You can't miss the tail because it is waving up and down.

"Let's consider what the two animals, snake and human, are experiencing in this encounter. Doing this will bring us very quickly to matters that border on what we cannot ever know, as well as, those things which we probably will know but just don't know now. Experiencing is a brain process involving millions of little nerve cells talking to each other by way of their nerve impulse messages. The parts of the brains of all vertebrates develop from equivalent parts in their embryos and the fine structures in the parts are similar. Moreover, the main brain parts function in similar ways. In the snake, the brain transitions to the spinal cord just below the head just as ours does. Above the spinal cord, the snake brain parts extend forward toward the nose of the snake, instead of growing up and out like the mushroom shaped brain we have. It's as if a map of the brain parts was plotted but on a printer page and then crumpled up as if to toss away. The parts would still be there with their same neighbors but the overall view might seem very different. So, snake brains are not exactly shaped like miniature versions of ours but one can easily see that many parts of a snake brain are similar to ours and that they carry equivalent information.

"The nerve cell bodies in brains are clumped together into nuclei; different nuclei have different functions. In the nineteenth century neurophysiologists found certain easily distinguishable cells in the rest of the body are especially sensitive to one particular aspect of the environment. These are the receptor cells and they are connected in various ways to nerves that run up to different nuclei. Mostly, the receptor cells are receptive to particular kinds of vibration, sound, light etc.

"As the snake finally turns its head towards you, it brings to bear at least seven senses to collect information about you and what to do next. The two extra senses, the sensitivity to pheromones and the sensitivity to infrared light, involve whole organs that we don't have.

"Snake eyes are very similar to ours: lenses, retinas the whole bit. However, the snake eye has far fewer receptors and is not as good an optical device as the human eye. Being blinded would be a death sentence for almost any wild vertebrate. Diamondbacks included, probably, but Diamondbacks also depend heavily on other senses. Nonetheless, they behave as if vision is their primary window to the external world just as it is for most vertebrates. The primary event in snake vision is the absorption of a quantum of light by a pigment molecule in a photoreceptor cell, just as it is in all other vertebrates. Virtually all living things respond in some way to light but vertebrate photoreceptor cells are uniquely sensitive. Their "visual" pigments are members of a very large family of membrane proteins, some of which go back to when life was still in the one cell stage. Light and life have been intertwined almost from the beginning and visual pigments started very early. While some kind of absorption event is a necessary first step, vision is far more than the detection of light quanta. Instead, we should think of vision in terms of creating a perceptual image of the external world.

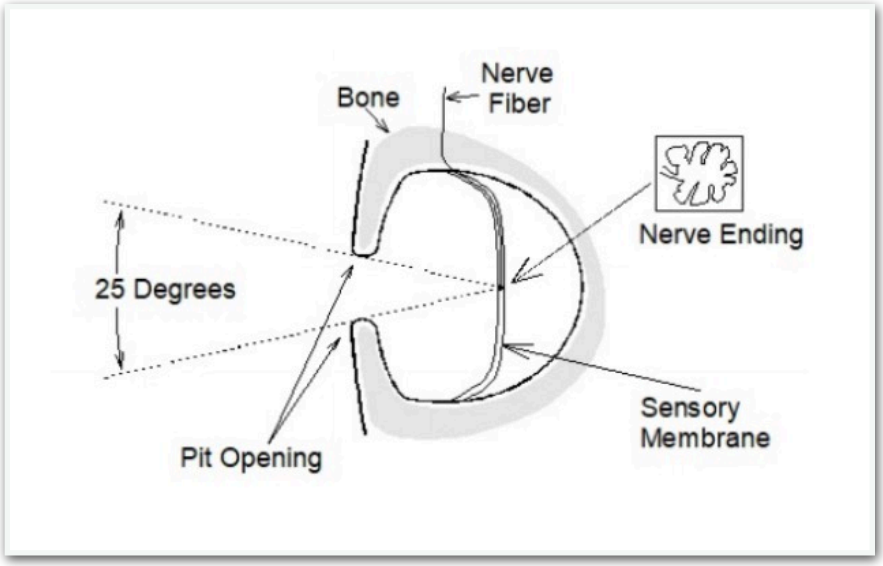
"The amount of information necessary to create even a fuzzy perception of a piece of the world is huge. Even a snake's small eye sends to its brain the Information from many tens of thousands of photoreceptors with other kinds of sensory information and memory as well. It is not surprising that data-reducing abstraction starts early on. A rattlesnake brain does even more: it integrates its primary light-based visual system with the entirely

different infra-red "visual" system. Infra-red quanta have longer wavelengths and are too weak for visual pigments to detect. How the rattlesnake puts all of this together is unknown. In any event, a Diamondback "sees" with a dual visual system not just with its photoreceptors.

"Like cameras, eyes focus light rays from distant objects on a photo-responsive surface, the retina. There the similarity to cameras stops. What the retina sends to the brain occurs after intense processing of the photo-images and is quite different from the simple image reproduction that a camera provides. The processing involves abstraction of features (lines, etc.) and the perception of objects. The rattler in the creek bed needs to know what are the dangers or opportunities in our encounter; the faster the better, so prior experience is incorporated early in the perception process. At what point the infra red, heat information is incorporated is not now known. Just the overall size of a discernible object is of vital importance and snakes will turn their heads to get different perspectives just as we do.

"Rattlesnakes have special organs which can detect the infrared rays coming from a rodent or a bird. They are unbelievably more sensitive than the heat receptors in our skins. These organs are called pits and since the only animals that have them are certain vipers, these animals are called pit vipers. The organs, themselves, are indeed, little pits in the face about half way down on a line between the eyes and the mouth. In a 4 foot Diamondback, the pits are 4-5 mm. or so in diameter. At a distance, a pit looks like a little black spot. About halfway into the pit from the orifice is an ultra-thin sensory membrane which divides the pit into a front and back. The sensors are simply expanded nerve terminals in the sensory membrane.

"It is likely that a rattlesnake is able to extract very little image information from its pits. What it can extract is the warmness, direction and perhaps size of a little bird or mammal. One should not minimize the value of such information, especially on a dark night when other animals might be



almost blind. Finally, one might expect that rattlesnakes have brain mechanisms to distinguish warm animals from warm rocks. This is unclear.

"For air breathers like snakes and humans, airborne molecules carry information about nearby food and dangers. The first event of the process of smelling (i.e. olfaction) involves small airborne molecules binding to molecular receptors in the membranes of some cells of the nose. The sources of these odors are usually other animals and plants. A second chemical sense involves molecules that are not volatile, the pheromones. These large molecules are detected by snakes using an organ humans don't have, the vomeronasal organ. This system provides information about other animals, especially other snakes. This system is also a communication system because the molecules provided by some animals identify themselves and their mating availability to others of the same species. The taste, smell, and vomeronasal receptors are specialized by which chemicals of the environ-ment they detect. Detection of environmental molecules is present in all vertebrates and invertebrates.

"In contrast with smelling, tasting is almost vestigial in rattlesnakes. There are taste receptor cells, but they are organized into just a few taste buds. In humans and other mammals taste probably became so important because the mammals eat so many different things. Rattlesnakes tend to be more specialized in their food and once a prey is struck, they tend to try to eat it. Diamondbacks probably have fewer than a couple dozen taste buds, while humans have around 4000.

"The rattlesnake in the creek bed is sampling molecules from its environment not only with its sense of smell but also with another similar system, the vomeronasal system. The paired vomeronasal organs are structurally quite similar to the nasal system but more complex. The molecules detected are now referred to in the scientific literature as vomodors to distinguish them from the volatile molecules, the odors, we associate with the sense of smell. Since the non-volatile vomodors are not carried by air currents to the sensors, they must be transported there in some other way. This involves their tongues working in at least two steps. First consider, rattlesnakes tongues are 1) long, 2) have long forked tines, and 3) are rough on their ventral surfaces. The tongue first, picks up non-volatiles by contact with the environment and then, second, folding the tongue back, deposits them into the fluid of the mouth. Then it flicks the tongue back out. Various kinds of evidence, including x-ray video, indicate that the tongue tines do not go into orifices in the vasonasal organ contrary to what was formerly thought. So currently, the forked nature of the snake tongue has no special role in the transport of vomodors.

So, the rattlesnake has a lot of sensory information to go over before it acts. No wonder it is slow."

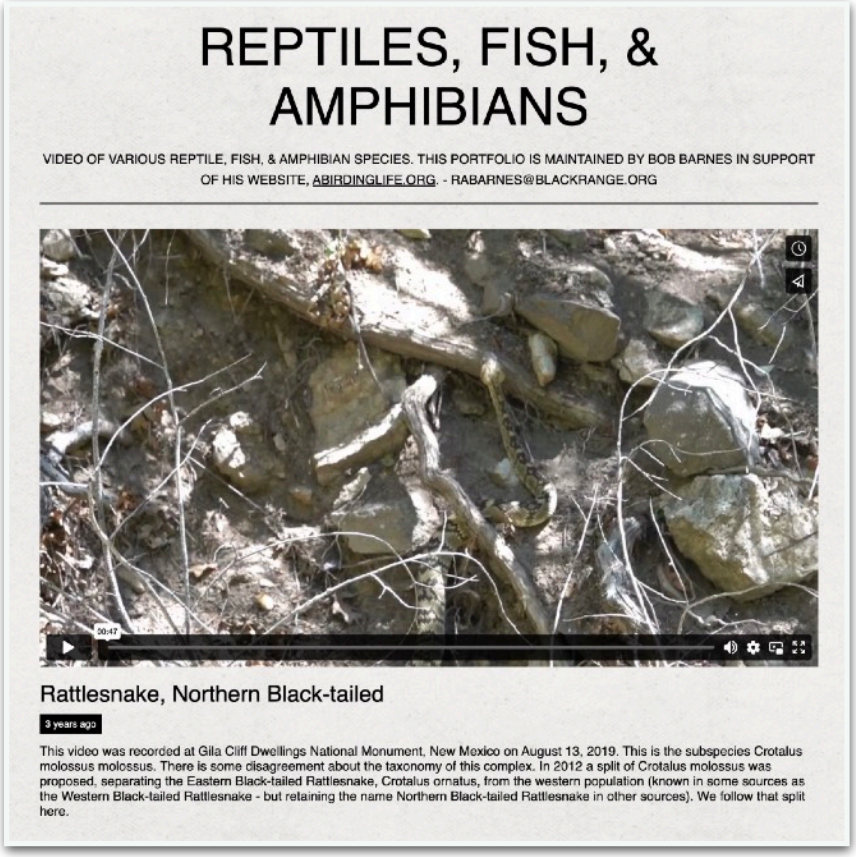
In the April 2019 issue of this journal Cindy Yarmal wrote about her experience of being struck by a Western Diamondback Rattlesnake. Although not a technical discussion (the subject of this article) it is well worth the time it takes to read. It is a great reminder that we need to be careful and lucky.

In the January 2020 issue of this journal Harley Shaw wrote on the issues associated with having dogs in snake country. We recommend "Dogs and Snakes" if you have a dog and go a wandering the countryside.

The January 2020 issue also included an update on the "Black-tailed Rattlesnake taxonomy" question. That article is included later in this issue as part of the species discussion (see also the call-out box on page 6).

Three rattlesnake videos are hosted by the www.blackrange.org website, one of the Northern Black-tailed Rattlesnake and two of the Western Diamondback Rattlesnake. To view the videos follow the link (orangish circle with an arrow at the lower right of each image). The video immediately to the right was recorded as part of Lloyd Barr's study of rattlesnake movement. A work which, unfortunately, was never completed.













Western Diamondback Rattlesnake

Crotalus atrox

Above and Below: Photographed along Animas Creek by Matilde Holzwarth on July 10, 2012. Right: Percha Box, east of Hillsboro, October 20, 2018

This is the species you are most likely to encounter in walks in/around the Black Range. Video of this species is found at this *link* and at this *link*. Additional photographs are found at this *link* and at this *link*.



Western Diamondback Rattlesnake (Con't)

Although this species is found over a relatively large area, there are no recognized subspecies.



Range map attribution.

Other English common names include "Coontail Rattler, Adobe Snake, Arizona Diamond Rattlesnake, Desert Diamond-back, Desert Diamond Rattlesnake, Fierce Rattlesnake, Spitting Rattlesnake, Texan Rattlesnake, Texas Diamond-back, Western Diamond Rattlesnake, Western Diamondbacked Rattlesnake" (NMHS).

As noted in Randy Gray's article (see earlier) the Mojave Rattlesnake can sometimes be confused with the Western Diamondback Rattlesnake, this because the Mojave also has a black and white striped tail. The Mojave Rattlesnake is not known from the Black Range. The white bands of the tail, on the Mojave, are broader than the black bands. In the Western Diamondback the black and white bands are more or less equal in width.

The venom of the various rattlesnake species varies. If you are struck, it is important to know what the species was that struck you. The venom of the Western Diamondback is hemotoxic, meaning that it affects blood vessels and the heart. From time to time, reports filter across the landscape which indicate that someone has been struck but they were waiting to see if it was a "dry strike". This is not a good response to a strike for three reasons: 1) In the Black Range we live a long way from anywhere, venom can have severely adverse effects in a short period of time, and those effects may not develop linearly (i.e. the effects may not seem to be very bad at first but then suddenly worsen); 2) Not all hospitals have anti-venom in stock (it is expensive and has a relatively short shelf-life); and 3) Even if not fatal, the strike of a Western Diamondback Rattlesnake can result in the loss of a limb and have serious long-term consequences - not always, but sometimes. The variability of effect (caused by the amount of venom injected, type of venom injected, and the reaction to the venom) and anti-venom availability issues compound the risk of delay in action.

Although most often seen crossing a road or in a lowland wash (a result of observer location not snake distribution) the Western Diamond-back Rattlesnake can be found well into the forests of the Black Range.

Over much of its range (including in the Black Range) the Western Diamondback will hibernate during the cold period. It will often hibernate in communal dens, sometimes with other species - including *Pituophis catenifer* (Gopher Snake). It is suspected that in warmer areas they may not hibernate, and during warm periods they can be seen in the Black Range at any time of year.

This species bears live young, which are usually born in late summer. Females can retain sperm for more than one year.

Be sure to check the latest authoritative advice on the use of kits like those below, before using them.







Banded Rock Rattlesnake

Crotalus lepidus klauberi





Top: This image, by Randall Gray, appeared in the first issue of this journal.

Middle: These images of a dead snake were taken along Middle Percha Creek, west of Kingston, by Steve Morgan.

NAFHA lists four subspecies of Rock Rattlesnake, two of which are found in New Mexico. The nominate form, the Mottled Rock Rattlesnake, is found as close as Otero County. The nominate form has a dark streak from the eye to the rear of the mouth (see right - attribution of this image can not be verified); *C. l. klauberi*, does not.

Rock Rattlesnake is also known as "Blue Rattlesnake, Green Rattlesnake, Green Rock Rattlesnake, Eastern Rock Rattlesnake, Little Green Rattlesnake, Pink Rattlesnake, Texas Rock Rattlesnake, and White Rattlesnake." (NMHS)

The Smithsonian's National Zoo notes that "The potency of the subspecies klauberi's venom varies throughout its range, suggesting that this snake's habitat and diet could be a factor in venom variations." The venom of this species is a hemotoxin. Potentially nasty stuff, up to and including things like bleeding from the eyes, ears, and nose.



This species is mostly diurnal, is generally found at elevations between 4,000' and 8,500', and bears live young.

Northern Black-tailed Rattlesnake

Crotalus molossus

The US Forest Service checklist referenced earlier was published prior to the split of the Black-tailed Rattlesnake into two species (*Crotalus ornatus* and *Crotalus molossus*, the Northern Black-tailed Rattlesnake).

Both of the *Crotalus molossus* photographs shown here are by Randall Gray. The top photograph appeared in the first issue of this journal. The bottom photograph was taken near Portal, Arizona, and appeared in the January 2020 issue of this journal; it was part of the article reprint included earlier.

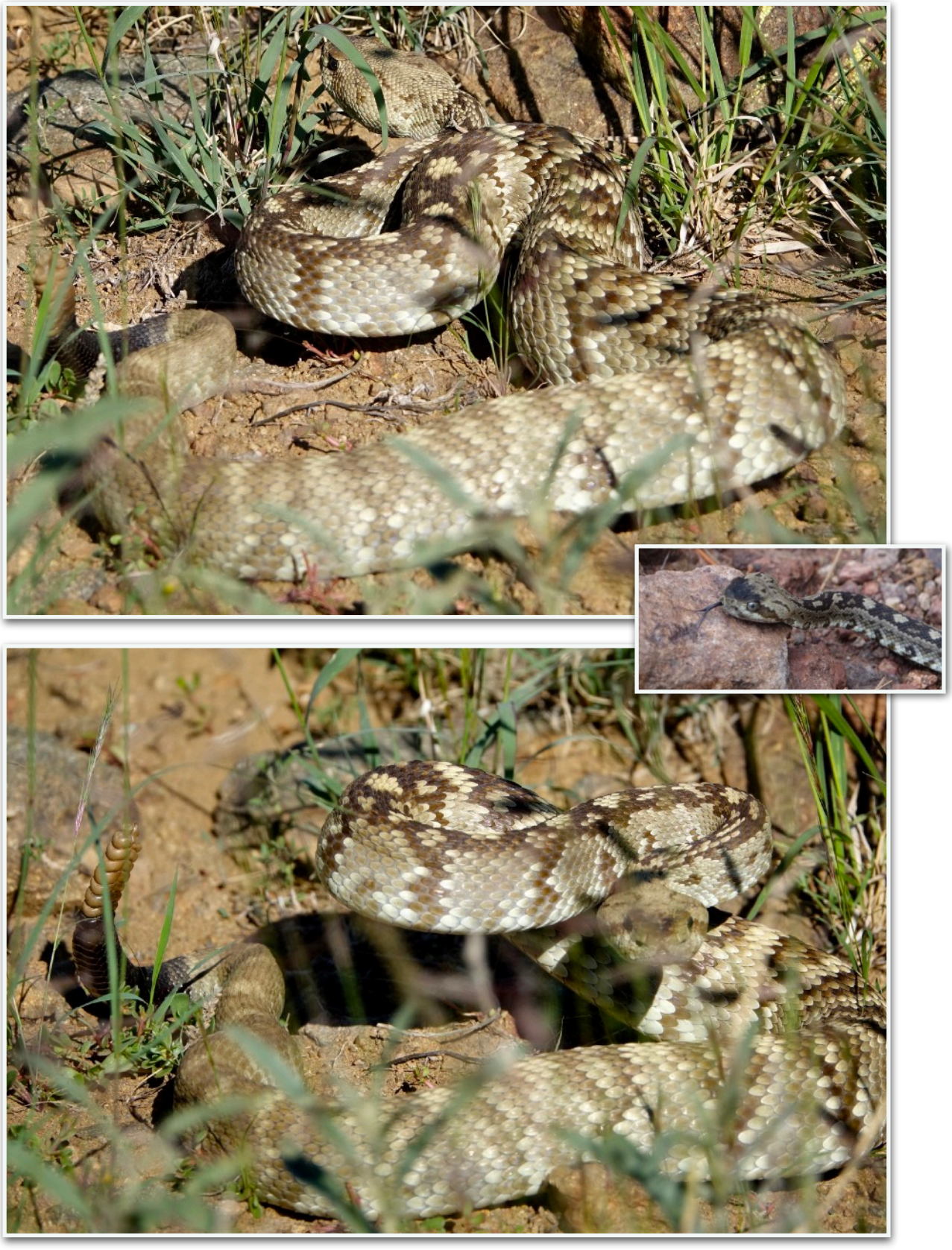




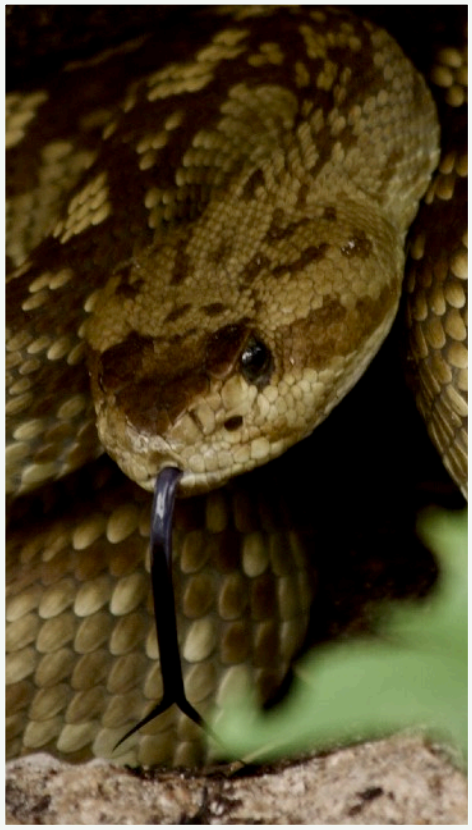
Ornate Black-tailed Rattlesnake

Crotalus ornatus

Crotalus ornatus, **which is shown here and on the next three pages is fairly common in the Black Range. The photographs below were taken near the ruins of Andrews east of Hillsboro, September 11, 2016. The inset is an individual photographed in Big Bend National Park, for comparison. Additional information about this species is included in the following article.**



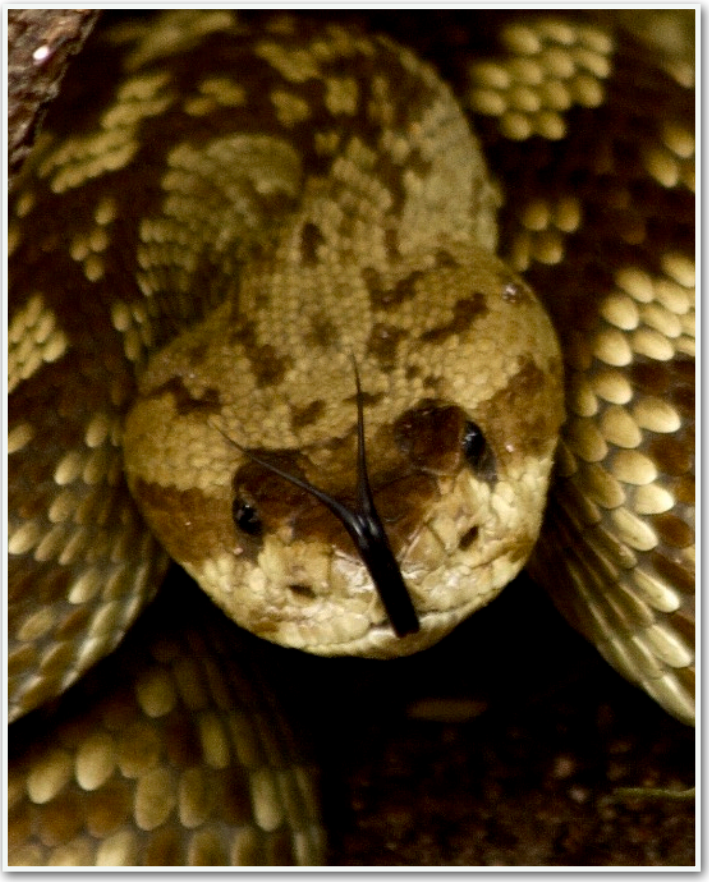






Ornate Black-tailed Rattlesnake
Middle Percha Creek west of Kingston, August 26, 2013.





Above: Ornate Black-tailed Rattlesnake, Middle Percha Creek west of Kingston, August 26, 2013.



Crotalus ornatus, Ornate Black-tailed Rattlesnake, Photo by Randy Gray
This image of a young snake appeared in the first issue of this journal.



Based on range, the following images are probably *Crotalus ornatus*. They were taken by Gordon Berman at the Soledad/Bar Canyon trailhead on the west side of the Organ Mountains.







***Crotalus ornatus,* Ornate Black-tailed Rattlesnake, Photo by Randy Gray. This image was taken on the southeastern slopes of the Black Range and appeared in the January 2020 issue of this journal, as part of the following reprint.**

The January 2020 issue of this journal included additional information about the taxonomic determinations associated with the Black-tailed Rattlesnakes. It is reprinted here.

Ornate (Eastern) and Northern Black-tailed Rattlesnakes

"In our first issue, Randy Gray provided an excellent summary of the rattlesnake species found in the Black Range. In "Rattlers of the Black Range", he noted that the Black-tailed Rattlesnake, *Crotalus molossus*, had recently been redescribed as two separate species by Anderson and Greenbaum.[1] In summary, the authors of the article Randy referred to "resurrect(ed) the name *Crotalus ornatus* Hallowell, 1854 for Black-tailed Rattlesnake populations in the Chihuahuan Desert and central Texas, USA" (paper abstract).

"Prior to the split, the most northerly subspecies of the Black-tailed Rattlesnake (*Crotalus molossus*) group was the one we are familiar with here in the Black Range - *C. m. molossus*. The range map shown at the top of the following page depicts the subspecies distribution prior to the paper; it is from page 20 of the cited publication and is from Campbell and Lamar (2004).[2]

"Rattlesnakes are thought to have originated in central Mexico.[2, 3, 4] The divergence of these creatures into thirty-five (or 32) species is estimated to have begun between 20 and 30 million years ago.[4] This dating was determined by using a variety of techniques including Monte Carlo (Markov Chain) runs, an assessment of fossil records, and morphological investigations. The greatest diversity of rattlesnake species is found on the Mexican plateau and adjacent mountain ranges. The most likely zone of origination lies within the Sierra Madre Occidental.[4]

"It is the most northerly of the subspecies which is of interest to us and the subject of the paper by Anderson and Greenbaum. The analysis performed by the authors found that divergence within *C. molossus* most likely began in the late Miocene, about 7.95 million years ago.

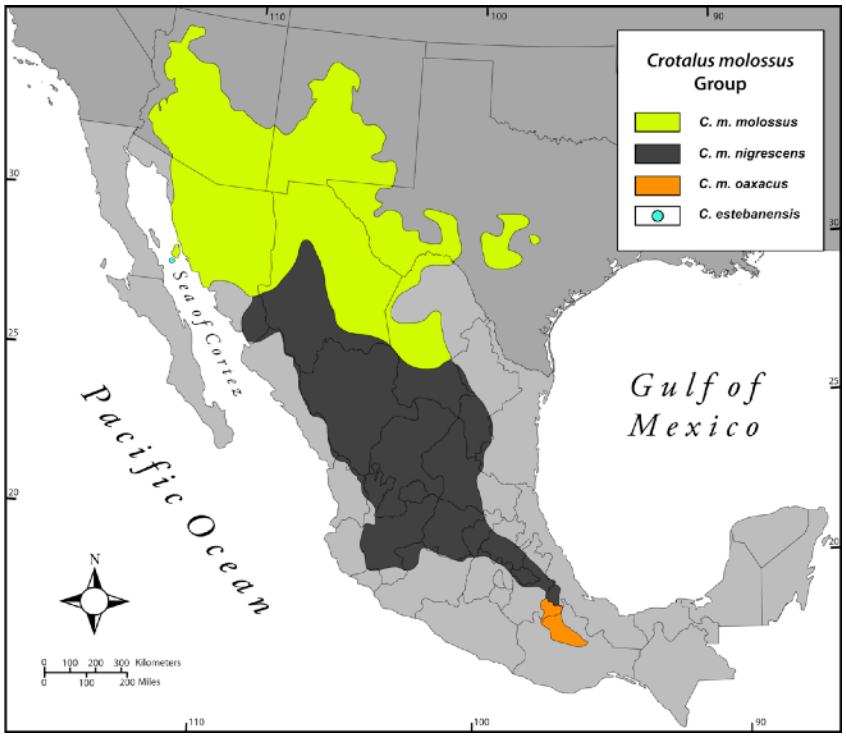
"At page 34 of the subject article, a graphic summary (see following page) of the various clades studies indicated a geographic boundary (the Black Range) between the clades (see arrow - added). The differences between the snakes to the east (the Chihuahuan Desert and central Texas populations) and to the west were significant enough to break the clades into separate species. The Madrean and Sonoran clades to the west remained as a subspecies of

***C. molossus, C. m. molossus*, the Northern Black-tailed Rattlesnake in some sources and the Western Black-tailed Rattlesnake in other sources. A total of 142 (significant) mutations have occurred between the two populations (east and west) since they were last in contact in the early Pliocene.**

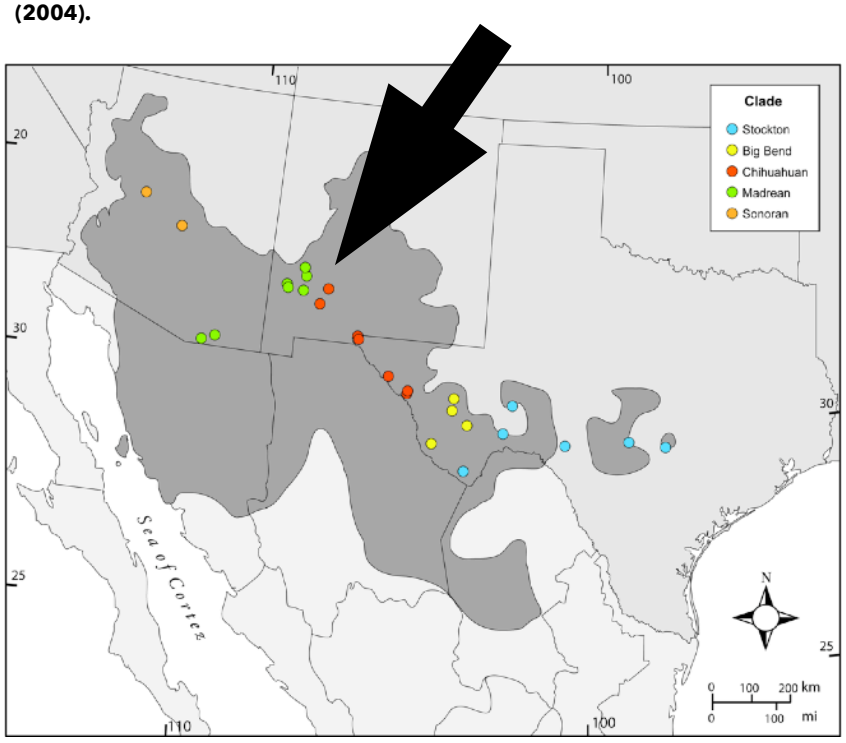
"The eastern population had been described by Hallowell in 1854 as *Crotalus ornatus* - later subsumed into *C. molossus*. The authors proposed that *C. ornatus* be restored as a full species and that the English common name of Ornate Black-tailed Rattlesnake be adopted.

"'*C. ornatus* is present in the Cook's (Ed.: Cooke's Range, but in some sources, Cookes Range) Range, the Mimbres Mountains, and the eastern slopes of the Black Range in south-central New Mexico. *Crotalus molossus* sensu stricto is present in the Madrean Archipelago of southwestern New Mexico, the Mogollon Mountains, and the Pinos Altos Range north of the Deming Planes (sic). The wide swaths of desert grassland that currently provide corridors between Sonoran and Chihuahuan habitats likely prevent dispersal between many of the mountain ranges occupied by *C. molossus* and *C. ornatus* in this region. However, mountain ranges that define the northern border of the Deming Planes (sic) (Mogollon, Pinos Altos, Mimbres, and Black Range) seem relatively well-connected and might allow contact between lineages. In this region, the Mimbres River and western continental divide north of the Mimbres Valley seem to represent the only potential barrier that may explain the apparent lack of introgression between *C. ornatus* and *C. molossus*'" (page 46 of the subject article).

"The zone of separation discussed above is the Cochise Filter Barrier (generally the zone between the Sonoran and Chihuahuan desert ecosystems). This area, and the significance it has for Northern Cardinals, was discussed in Volume 2, Number 2, of this publication ("The Work of Kaiya Smith and Others"). Even in the case of Northern Cardinals, which fly, the barrier has played a significant role in speciation.

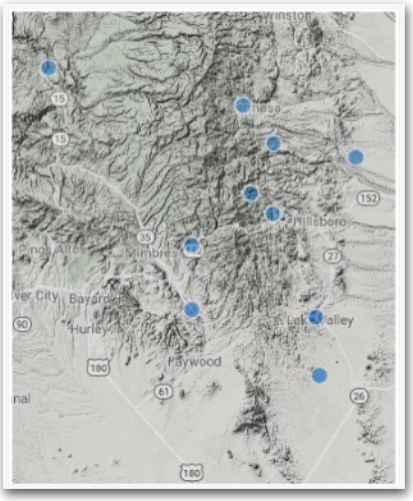


Anderson and Greenbaum, Page 10: Figure 1.5.1 Geographic distribution of the *Crotalus molossus* group. Modified from a map by Campbell and Lamar (2004).



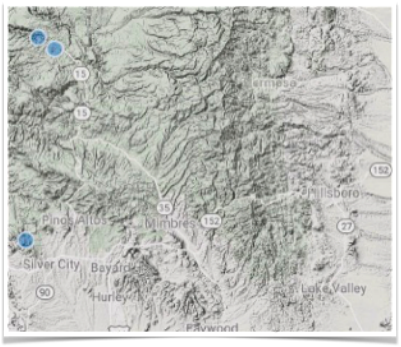
Anderson and Greenbaum, Page 34: Figure 3.1.3 Sampling localities and geographically defined clades recovered in haplotype and phylogenetic analyses of Crotalus molossus. Gray shading depicts the general distribution of C. m. molossus; modified from a map by Campbell and Lamar (2004).

"At page 46 of the Anderson/ Greenbaum article there is a rather good discussion of how the Cochise Filter Barrier developed and why it has had such a significant impact on the plants and animals of this area. The Ornate Black-tailed Rattlesnake (*C. ornatus*) is encountered periodically along the eastern slopes of the Black Range.



"Above: *Crotalus ornatus* sightings documented on the iNaturalist website. The sighting shown in the upper left is from the Middle Fork of the Gila River, not far from where the video of what Bob Barnes identified as a Northern Black-tailed Rattlesnake was taken. The Ornate Black-tailed Rattlesnake is referred to as the Eastern Black- tailed Rattlesnake at iNaturalist.

"The English common name for *Crotalus molossus molossus* is also unsettled with both Northern Black-tailed Rattlesnake and Western Black-tailed Rattlesnake being used. Note that sightings of both species are documented on iNaturalist for the area around the Gila Cliff Dwellings.



Above: *Crotalus molossus molossus sightings documented on the iNaturalist website. The righthand sighting of the two shown in the upper left is in the vicinity where the video mentioned above was recorded.*

"This may represent a misidentification of the Ornate Black-tailed Rattlesnake recorded for that area, it may represent the fact that this is an area where both species are present, or it may represent the possibility of intergrades at this locale.

"It may be fairly safe to assert that a Black-tailed Rattlesnake found in the Black Range will be *C. ornatus*. "

1. "Phylogeography of Northern Populations of the Black- Tailed Rattlesnake (Crotalus molossus Baird and Girard, 1853), With the Revalidation of C. ornatus Hallowell, 1854" by Christopher G. Anderson and Eli Greenbaum, Herpetological Monographs, 26(1):19-57. 2012

2. Campbell, J. A., and W. W. Lamar. 2004, *The Venomous Reptiles of Latin America*. Cornell University Press, USA.

3. Murphy, R.W., J. Fu, A. Lathrop, J. V. Feltham, and V. Kovac. 2002.

4. "Phylogeny of the rattlesnakes (Crotalus and Sistrurus) inferred from sequences of five mitochondrial DNA genes". pp. 69–92 in G.W. Schuett, M. Hoggren, M.E. Douglas, and H.W. Green (Eds.), Biology of the Vipers. Eagle Mountain Publishing, USA.

5. "A Quantitative Analysis of the Ancestral Area of Rattlesnakes" by Aaron J. Place and Charles I. Abramson, Journal of Herpetology, Vol. 38, No. 1 (March 2004) pp. 152-156"

Western Prairie Rattlesnake

Crotalus viridis virdis

Listed as Western Rattlesnake on the Gila National Forest Service checklist. In addition to Prairie and Western, it is also known as the Common, Green, and Plains Rattlesnake - and a few more.

NAFHA does not recognize any subspecies of the Prairie Rattlesnake. Other sources recognize two subspecies, the nominate form (known as the Western Prairie Rattlesnake) which is found in our area and the Hopi Rattlesnake, *C. v. nuntius*. Both subspecies are included in the range map which is shown below.



Range Map Attribution

The taxonomic history of this species has been unsettled and at one point included all of the subspecies of *Crotalus oreganus*, the Western Rattlesnake - thus the use of that term on the USFS checklist for the Gila.

The photograph at the top of the following page was taken by Randall Gray and appeared in the first issue of this journal. The individual shown at the bottom was photographed near Milnesand (eastern NM) on April 17, 2011.

The Prairie Rattlesnake can be aggressive, and may inject from 20 to 55 percent of its venom in one bite. The venom of this species is complex and includes both hemotoxin and neurotoxin (affecting the nervous system). Under no circumstance should a person wait to see if a strike by this species is "dry" before seeking medical treatment.

In the April 2019 issue of this journal we noted that:

"There is growing evidence that the venom of several rattlesnake species is shifting in composition to be both hemotoxic and neurotoxic. Not good news for those who are struck.

"Some sources attribute the shift to the fact that the prey of many rattlesnake species have evolved more resistance to hemotoxic venom. The rattlesnakes have, in turn, (apparently) begun to develop more complex venoms. In the short term, for humans who have been struck, this means that treatment regimes often involve more vials of antivenom than was previously the case."







Western Prairie Rattlesnake, *Crotalus viridis viridis*, Chaco Culture National Historical Park, New Mexico, Sep 3, 2015





Western Prairie Rattlesnake, *Crotalus viridis viridis*, Milnesand, N.M., April 17, 2011



Regal Ringneck Snake

Diadophis punctatus regalis

This species is not listed on the USFS checklist but is listed for Grant/Sierra County by NMHS. NAFHA lists 14 subspecies of *D. punctatus,* Ringneck Snake.

Other common English names include Red-bellied Snake, Punctated Viper Ring Snake, and Western Ring-necked Snake.

Although the ring around the neck is distinctive, it is often absent in this subspecies.

This is a species of rocky hillsides, grasslands, and forest edges. In Arizona it has been found between 2,200′ and 7,000′ in elevation.

These photographs by Megan Perry were taken along the Ladder Ranch Road on the east side of the Black Range.





This species has a rather dramatic defensive display: curling up, rolling over, and displaying its beautiful underside. At the same time that all of this is going on the snake will be expelling strongly smelling unpleasant musk.

It is a small snake, but one of the larger ringneck subspecies, generally between 8 and 34 inches in length. It is ophiophagous (it feeds on small snakes) but may also eats lizards and insects. Its small size and secretive behavior have resulted in few sightings in this area.





Range of D. p. regalis.



5. Diadophis regalis, B. & G.—Body above uniform greenish ash; beneath light yellow, scattered all over with small black spots. No occipital ring. Dorsal scales in 17 rows.

Head proportionally short and broad behind; head less depressed than in the preceding species, though flattened above; snout rounded. Eyes very small. Vertical plate subpentagonal, tapering posteriorly. Superciliaries narrower anteriorly. Body long and subcylindrical. Scales proportionally large and elongated, in 17 rows; those of the outer row conspicuously broader. The upper and lower jaws and inferior surface of head maculated with black, on a light ground. Color of the abdomen extending to the outer row of scales, which are dotted with black posteriorly. The black spots on the abdomen extend considerably beyond the anus.

Sonora, Mex. 237+1. 58. 17. 22¾. 3¾. Col. J. D. Graham.

***Description as it originally appeared in the Catalogue of North American reptiles in the Museum of the Smithsonian institution : Part I.–Serpents*, Baird and Girard 1853.**

Chihuahuan Hook-nosed Snake

Gyalopion canum

This species is not listed on the USFS checklist but is listed by NMHS for this area. In Arizona it is typically found at elevations below 6,000'. NAFHA does not list any subspecies of this snake. This species was originally described (1860) by Edward Drinker Cope, of the fossil wars fame. He later lost his fortune in Lake Valley.

Other English common names include the Western Hooknose Snake and Fart Snake, the later because of a rather unique defensive behavior.



Map by R. Brausse.



Photographs by Travis Perry.



Mexican Hog-nosed Snake

Heterodon kennerlyi

This species is not listed on the USFS checklist but is listed by NMHS for this area. Some authorities treat this species as a subspecies of the Western Hognose Snake, *Heterodon nasicus*. Other English common names include Hognose, Puff Adder, and Blow Snake.

This species is mildly venomous, mostly a problem for the toads it eats, but it is unclear if the venom is introduced via contact with the snake's saliva or from its rear-facing fangs.



Range Map from iNaturalist



Photograph of Mexican Hog-nosed Snake by Natalie McNear

NMHS describes the behavior of this species this way: "Nature's actors, these snakes will go through a whole routine if threatened. They will spread their necks and hiss. Then they will strike to the side. Then they will flop over and play dead. They will lie there with their tongue hanging out and will musk and vomit. If turned over, they will immediately turn back over."

Plains Hog-nosed Snake

Heterodon nasicus

This species is not listed on the USFS checklist but is listed by NMHS for Sierra County. Its other English common names are the same as those applied to the Mexican Hog-nosed Snake. This species and the Mexican Hog-nosed Snake were once considered subspecies of the Western Hognose Snake. This species retained the Latin binomial.

The Plains Hog-nosed Snake is found in Sierra County eastward to Oklahoma, Texas, Missouri, and Illinois. To the north it reaches the Canadian prairie provinces. To the south it is replaced by the Mexican Hog-nosed Snake.

The Plains Hog-nosed Snake is found in sparsely vegetated areas with well-drained soils.

Adult Plains Hog-nosed Snakes can reach 25 inches in length, but note the photograph below. These are small snakes.

When confronted, the first reaction of this snake will be to flee down a burrow or other opening or attempt to bury itself in the soil. Less frequently, or when escape is not possible, it will flatten its head and neck (thus appearing larger), hiss, even strike, typical defensive behaviors. If the first two lines of defense are ineffective it may "play dead". It begins this display by withering on the ground, then it turns belly up and remains still with its mouth open and its tongue hanging out (see photo below) - all of this in the palm of your hand.

Many snake species are venomous in the sense that they posses toxins. In the case of most species the toxin does not have a significantly adverse effect on humans, either because it is not potent enough to have a severe effect and/or there is too little toxin to be effective on a species as large as a human. This is the case with this species: its toxin is effective against its prey but generally will cause only irritation and some swelling on humans. In addition, many species have delivery systems which are ineffective against humans. For instance, they may be small and thus any teeth/fangs are small or the teeth/fangs may be backward facing. In some cases it is not clear if the toxin is delivered as part of the saliva or injected.



Plains Hog-nosed Snake. Attribution

Chihuahuan Night Snake

Hypsiglena jani

This species is not listed on the USFS checklist but is listed by NMHS for this area. This species is nocturnal but may also be found at dusk and dawn. NAFHA lists 3 subspecies of

Chihuahuan Night Snake, sometimes called the Texas Night Snake. The subspecies found in our area is *H. j. texana*. The range of the Chihuahuan Nightsnake is shown in yellow on the map to the right.

These snakes grow to about 16" in length.





Photographs of Chihuahuan Night Snake, South of Hillsboro, New Mexico, by Travis Perry,



Western Milksnake

Lampropeltis gentilis celaenops

Not listed on the USFS checklist, but see NMHS. This species is found in four counties which abut Sierra and Grant Counties, but the species is not listed for Sierra and Grant. Additional survey work is in order. At NMHS the species is listed as *Lampropeltis triangulum*. We recognize the split of *L. triangulum* listed in the Reptile Data Base.



Photograph of a Western Milksnake by John Sullivan, via iNaturalist under a Creative Commons license.

Sonoran Mountain Kingsnake

Lampropeltis pyromelana pyromelana

The photographs on this page were taken in Kingston by Tom Lander on May 8, 2022.

In New Mexico, this species has been found only in the southwestern counties. Otherwise it is found from western Utah/eastern Nevada, south into Sonora and Chihuahua. At the time *Amphibians and Reptiles of New Mexico* (Degenhardt, Painter, and Price) was published, verified reports of the species existed as far east as northwestern Sierra County. The individual shown here may be the most easterly verified specimen, by a snake's scale.

It is most easily distinguished from the Milk Snake, *Lampropeltis triangulum*, by its yellow (or white) snout - which is black in the Milk Snake.

There are two subspecies; only the nominate form, known as the Arizona Mountain Kingsnake, is found in New Mexico. All sightings have been between April and October.

According to NMHS, this species can be differentiated in the field from the Madrean Mountain Kingsnake only by range. The Madrean is found in the extreme western portion of the New Mexico boothill.
The Sonoran Mountain Kingsnake is a secretive diurnal snake, thus the population in the Black Range is difficult to determine. It is generally found at elevations between 3,000 and 9,000 feet. The individual shown here was photographed at roughly 7,000'. It is typically found in rocky stream courses.







Sonoran Mountain Kingsnake Range Map



Desert Kingsnake

Lampropeltis splendida

The species is listed as *L. getulus,* the Common Kingsnake, in the USFS checklist. Since publication of the checklist, the specific name of that species has changed to *Lampropeltis getula*. When the checklist was published, the population of this species found in our area was considered a subspecies, *L. g. splendida*. Some sources, for example NAFHA, continue to recognize these snakes as a subspecies of the Common Kingsnake, *L. getula splendida*. The Reptiles and Amphibians of Arizona website also recognizes these snakes as a subspecies of the Common Kingsnake.

In this listing we follow other authorities and consider the snake found in our area as a full species, *L. splendida*, the Desert Kingsnake. English common names for this species include "Splendid Kingsnake, Sonoran Kingsnake, Boundary Kingsnake, Mexican Kingsnake" (NMHS). Not to be confused with "Sonoran Mountain Kingsnake", a different species.

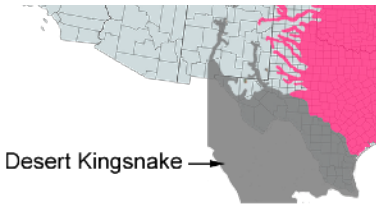
This species is uncommon in our area, typically found in oak, oak-juniper, and pinyon-juniper woodlands. They tend to prefer riparian areas.

Although the diet of this species includes other snakes, including rattlesnakes (they have high resistance to the venom), they are often docile when encountered. Adult diamond-backs will retreat quickly when they encounter the smell of one of these kingsnakes.

This species is typically nocturnal. It mates in spring, eggs (5-12) are laid about 30 days later, and the eggs hatch after about 60 days.

This is one of the species which will feign death when threatened, typically by rolling over onto its back and not moving.

The range map below was developed by the Virginia Herpetological Society.





Photographs of Desert Kingsnake by Travis Perry.



Sonoran Whipsnake

Masticophis bilineatus

Not listed on the USFS checklist, but see NMHS. NMHS indicates the range of this species includes Grant County. Some sources (NAFHA) continue to list this species as *Coluber bilineatus*.

Sightings of this species appear to be in the very southwestern part of New Mexico. The species is not likely to be encountered in the Black Range.



Photograph of a Sonoran Whipsnake by Michael Price, via iNaturalist under a Creative Commons license.

Coachwhip

Masticophis flagellum

Some authorities place these snakes within the genus *Coluber* (NAFHA). *M. f. testaceus,* the Western Coachwhip, is found in Sierra County and *M. f. lineatulus,* the Lined Coachwhip, is found in the southern portions of Grant County (NMHS).

This species is common in oak and oak-juniper woodlands.

The six subspecies of Coachwhip are difficult to distinguish from each other, a problem where ranges overlap.

The photographs below and on the following page were taken by Gordon Berman near where US-70 crosses the Rio Grande. In describing the photographic event, Berman noted that "this coachwhip raced across a dirt road, seemingly flew over a rock wall, then nestled into a mesquite. From spooked to curious, it gave me these photos."











The photograph to the left was taken by Gordon Berman, as described previously.

Areas of distribution are not lines in the sand, despite how they might look on some range maps. On the range map below (from California Herps) most of New Mexico is shown within the range of the Western Coachwhip, with a bit of the range of the Lined Coachwhip (green) in the far southwestern part of the state and a range of inter-grade (gray) on the Arizona-New Mexico border. Gordon Berman's photographs may be Western Coachwhip, by range. That is how we list it here, but such a determination is imprecise given the location where the photographs were taken. Note, however, the photograph at center left, of a Lined Coachwhip (*Masticophis flagellum ssp. lineatulus*). This image was taken by Edward L. Ruden in eastern Socorro County. Provided here under a Creative Commons license and is considered research grade by iNaturalist.







The photograph above, of a Western Coachwhip, by Michael Jocobi, was taken south of Hillsboro, New Mexico, along NM-27. It is an apparent road kill and is provided here under a CC license.



The Western Coachwhip (*M. f. testaceus*) shown above was photographed in Milnesand (eastern New Mexico) on April 17, 2011.

Desert Striped Whipsnake

Masticophis taeniatus taeniatus

Some authorities place these snakes within the genus *Coluber*, in which case it is *Coluber taeniatus taeniatus*. (NMHS and NAFHA). There are two subspecies; the nominate form is found in our area.

This species is diurnal and quick. It feeds on small things, everything from snakes and lizards to insects.

The female of this species lays its eggs (between 3-12) in June-July and they hatch between 1.5 and 2 months later.

This species is common in oak-juniper and pinyon-juniper woodlands, as well as in the foothills surrounding the Black Range.



Masticophis taeniatus taeniatus
Desert Striped Whipsnake
Photographed at Andrews, which is a ghost town northeast of the Copper Flat Mine near Hillsboro.
July 17, 2015







***Masticophis (Coluber) taeniatus taeniatus* - Desert Striped Whipsnake - Percha Box, East of Hillsboro, NM. Aug. 8, 2017**

Arizona Coral Snake

Micruroides euryxanthus euryxanthus

The species is known as the Sonoran Coralsnake, the subspecies as the Arizona Coral Snake. (Although it has little to do with taxonomy, you really have to appreciate the fact that the common name has two treatments of "Coral Snake/Coralsnake" in the same species.) The NMHS site indicates that this species is found in Grant but not Sierra County. There are three recognized subspecies.

"Red on Yellow, Bad for a Fellow". Note, however, that the tail of this species may lack red bands.

Bob Barnes reports that he has been told by some ranchers in the area that they have seen Coral Snake in the Percha Box on the east side of the Black Range. We know of no evidence to support those observations or identifications. This species is rare in oak-juniper and pinyon-juniper woodlands, Chihuahuan scrublands, and semi-desert grasslands.



Photograph of an Arizona Coral Snake by Steve Marks, via iNaturalist under a Creative Commons license. Near Rodeo, New Mexico.

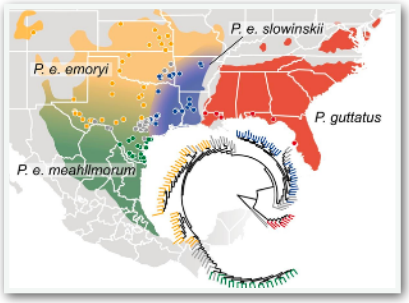
Great Plains Ratsnake

Pantherophis emoryi

This species is not listed on the USFS checklist, but NMHS indicates the range of this species includes Sierra County. This species is also known as Emory's Ratsnake and Corn Snake. Randy Gray has photographed this species south of Hillsboro, NM on NM-27.



Photograph of a Great Plains Ratsnake by LA Dawson, used here under a CC license. At the time this photograph was originally posted on the internet the species was listed as *Pantherophis guttatus emoryi*.



This species has been treated as a subspecies of *Pantherophis guttatus* at various times in the past. The most recent taxonomic study of these snakes (Thomas L. Marshall, E. Anne Chambers, Mikhail V. Matz, David M. Hillis, "How mitonuclear discordance and geographic variation have confounded species boundaries in a widely studied snake", *Molecular Phylogenetics and Evolution,* Volume 162, September 2021) split *P. guttatus* into two species, the eastern species and *P. emoryi*, which is divided into three subspecies.

Bullsnake

Pituophis melanoleucus

We make a short deviation from our alphabetical listing to dispense with *Pituophis melanoleucus*, Bull Snake. The Forest Service checklist indicates that this species is common in desert, oak, oak-juniper, and pinyon-juniper woodlands. This may be an erroneous entry resulting from the use of the common name of Bull Snake for Gopher snake. The Bull (Pine) Snake, *Pituophis melanoleucus,* is a species of the American southeast and is not found in our area. Note, however, that one of the English common names for *Pituophis catenifer sayi*, which is found in eastern New Mexico, is Bull Snake. On a page 37 we provide photographs of *Pitupohis catenifer affinis* and *P. c. sayi* for comparison.



Sonoran Gopher Snake

Pituophis catenifer affinis

This species is not listed on the checklist, most likely because "Bull Snake" was erroneously listed (see previous page). NAFHA lists ten subspecies of *Pituophis catenifer*. *P. c. affinis,* the Sonoran Gopher Snake, is the subspecies found in our area. Other sources recognize only six subspecies.

This is the longest snake species found in the Black Range; individuals are sometimes six or seven feet in length.

Gopher Snakes are generally calm but can become more aggressive when threatened. At such times they can take on the appearance and behavior of a rattlesnake.

The photograph to the left was taken by Travis Perry on NM-27, south of Hillsboro. This is a common species in our area and is often found crossing roads, especially at night.





Photographs Above: *Pituophis catenifer affinis* in Hillsboro, New Mexico, May 1, 2011.
Below: Sonoran Gopher Snake, *Pituophis catenifer affinis,* Warm Springs Wash, East of Hillsboro, NM, June 25, 2016





Left Center: *Pituophis catenifer sayi*, the Bullsnake. April 26, 2014, Chihuahua Desert Museum, Ft. Davis, TX
Left: Sonoran Gopher Snake, *Pituophis catenifer affinis,* Warm Springs Wash, East of Hillsboro, NM, June 25, 2016







Photographs directly above and upper right from Milnesand, New Mexico. April 17, 2011.
***Pituophis catenifer sayi*, the Bullsnake.**

The Blindsnakes or if you wish the Threadsnakes

On this and the next two pages we summarize our understanding of the natural history and taxonomic relationships of two species of Blind Snake found in the Black Range. As simple as that statement seems, there is more than a little disagreement about several aspects of the statement. What is their proper English common name, Threadsnake or Blindsnake or something else; how many species are actually found here; how are those species placed within the genus and what is the genus?

This is our understanding. The USFS checklist, which was published early in the evolving controversy associated with this genus, lists two species in the Black Range: *Leptotyphlops dulcis*, the Texas Blind Snake; and *Leptotyphlops humilis,* the Western Blind Snake.

In 2009, Adalsteinsson[1] et al. reviewed the genus *Leptotyphlops* (which included species in both the Eastern and Western Hemispheres), and found two distinct clades. The clade found in Central and North America was changed to *Rena,* the genus name originally given this group of species by Baird and Girard[2] in 1853. Thus you will note that in the species listing we refer to the snakes found here as being in the genus *Rena* not *Leptotyphlops*. In doing so, we defer to Flores-Villela[3] et al. who we believe present the most thorough understanding of the taxonomy of this group of snakes. We note, as do Flores-Villela et al., that the genus *Rena* and the placement of various species within the genus is not settled completely. NMHS and NAFHA list these snakes within the genus *Leptotyphlops*. iNaturalist and the Reptile Database place these snakes with *Rena*.

The two most common English names for snakes in this group are Blindsnake (spelled Blind Snake by some authorities) and Threadsnake. Following Flores-Villela we refer to these snakes as Blindsnakes.

All of the Blindsnakes found in our area fall within one of two groups of species. The *Rena dulcis* group (with five species) and the *Rena humilis* group (with either four or five species).

Flores-Villela[3] et al found that the species listed as *L. humilis* in the checklist should (currently) be considered *Rena humilis* and the species listed as *L. dulcis* in the checklist should be considered *R. segrega*.

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1. Adalsteinsson, S. A., Branch, W. R., Trape, S., Vitt, L. J., & Hedges, S. B. (2009). "Molecular phylogeny, classification, and biogeography of snakes of the Family *Leptotyphlopidae (Reptilia, Squamata)*", Zootaxa, 2244, 1-50. https://doi.org/10.11646/zootaxa.2244.1.1
2. Baird, S. F., & Girard, C. (1853). Catalogue of North American reptiles in the Museum of the Smithsonian Institution. Part I - Serpents. Washington D.C., Government Printing Office. https://doi.org/10.5962/bhl.title.5513
3. Flores-Villela, Oscar, Smith, Eric, Canseco-Márquez, Luis, and Campbell, Jonathan. "A new species of blindsnake from Jalisco, Mexico", Rev. Mex. Biodiv. vol.93 México 2022 Epub 30-Mayo-2022

New Mexico Blindsnake

Rena dulcis

This species is also known as the New Mexico Threadsnake, Texas Blindsnake, Texas Threadsnake, and Texas Blind Snake.

The USFS checklist includes *Leptotyphlops dulcis*, Texas Blind Snake. You might think that the current Latin binomial change is simply a change of genus, from *Leptotyphlops* to *Rena*. It turns out to be a bit more convoluted.

The synonym listing at the Reptile Database demonstrates the confusion associated with these little snakes (up to 12" in length):

- ***Rena dulcis*, Baird & Girard 1853**
- ***Stenostoma dulce*, Cope 1861**
- ***Stenostoma (Rena) dulce*, Jan 1863**
- ***Stenostoma tenuiculum*, Garman, 1884**
- ***Stenostoma rubellum,* Garman 1884**
- ***Stenostoma myopicum*, Garman, 1884**
- ***Stenostoma tenuiculum*, Garman, 1887**
- ***Stenostoma rubellum*, Garman, 1887**
- ***Rena tenuicula,* Cope, 1887**
- ***Leptotyphlops dulcis*, Stejneger, 1891**



New Mexico Blind Snake by Brian Box. Photographed just north of Kingston, New Mexico, Black Range. Image used via CC from iNaturalist.

- *Glauconia dulcis,* Cope, 1892
- *Glauconia dulcis*, Boulenger, 1893
- *Glauconia myopica,* Boulenger 1893
- *Glauconia dissecta,* Cope, 1896
- *Leptotyphlops myopica*, Barbour & Loveridge, 1929
- *Leptotyphlops dulcis myopicus*, Klauber, 1940
- *Leptotyphlops dulcis dulcis,* Klauber 1940
- *Leptotyphlops humilis tenuiculus*, Klauber, 1940
- *Leptotyphlops dulcis dissectus,* Klauber, 1940
- *Leptotyphlops myopicus myopicus,* Smith, 1944
- *Leptotyphlops myopicus myopicus,* Smith & Taylor, 1945
- *Leptotyphlops myopicus dissectus*, Smith & Taylor 1945
- *Leptotyphlops myopicus dissectus*, Smith & Sanders, 1952
- *Leptotyphlops dulcis dissectus,* Hahn, 1979
- *Leptotyphlops dulcis myopicus*, Hahn, 1979
- *Leptotyphlops dulcis dulcis*, Hahn 1979
- *Leptotyphlops dulcis*, Stebbins, 1985
- *Leptotyphlops dulcis supraocularis,* Tanner, 1985
- *Leptotyphlops dulcis*, Conant & Collins, 1991
- *Leptotyphlops dulcis*, Liner, 1994
- *Leptotyphlops dulcis*, McDiarmid, Campbell, and Toure, 1999
- *Leptotyphlops dulcis dulcis*, Crother, 2000
- *Leptotyphlops dulcis dissectus*, Crother, 2000
- *Leptotyphlops dulcis dissectus*, Dixon, 2000
- *Leptotyphlops dulcis dissectus*, Tennant & Bartlett, 2000
- *Leptotyphlops dissectus*, Dixon & Vaughan, 2003
- *Rena dulcis rubella*, Dixon & Vaughan, 2003
- *Leptotyphlops myopicus*, Dixon & Vaughan, 2003
- *Rena myopica*, Adalsteinsson, Branch, Trape, Vitt, & Hedges, 2009
- *Leptotyphlops* sp. B, Adalsteinsson et al. 2009
- *Rena* sp. B., Adalsteinsson et al. 2009
- *Leptotyphlops dissectus*, Bateman et al. 2009
- *Rena dissecta*, Adalsteinsson et al. 2009



New Mexico Blind Snake by Brian Box. Photographed just north of Kingston, New Mexico, Black Range. Image used via CC from iNaturalist. Yes, the left part of the image is a human thumb.

- *Leptotyphlops myopicus*, Vite-Silva et al. 2010
- *Rena dulcis*, Crother et al., 2012
- *Rena dulcis rubellum*, Crother et al., 2012
- *Rena dissectus*, Crother et al., 2012
- *Rena dissecta*, Wallach et al. 2014
- *Rena dulcis*, Wallach et al. 2014
- *Rena myopica*, Wallach et al. 2014
- *Rena dulcis rubella*, Crother et al., 2017
- *Rena dissectus*, Crother et al., 2017
- *Rena dulcis*, Flores-Villela, 2022

Having listed the above, I should point out that the list overstates the "confusion". Some of this work represents an attempt to reconcile a previous finding with more recent determinations of others. That said, it is fair to say that it has taken a lot of time and effort to get *Rena dulcis* into its current box. You many encounter any of the synonyms listed above if you research this species.

See the New Mexico Herpetological Society website page for this species for additional details about its natural history. NatureServe also contains an excellent description of this species. As in some other snake species, "mating balls" of several male blind snakes trying to mate with a female blind snake are not uncommon.

This species is rare in our area, where it is typically found in "Chihuahuan desertscrub, semidesert grassland, and the lower reaches of Madrean evergreen woodland communities" (NMHS).



Left: Photographed in the Florida Mountains, east of Deming by mgharvey, used here under a CC license.

Trans-Pecos Blindsnake

Rena segrega

The USFS checklist includes this species as *Leptotyphlops humilis*, the Western Blind Snake. Other common names for this species are Western Threadsnake and Trans-Pecos Threadsnake.

The New Mexico Herpetological Society website page on this species and NAFHA both list this species as *L. humilis*, in the NAFHA listing as a subspecies, *L. h. segregus*. iNaturalist and the Reptile Database follow Flores-Villela (see earlier cite) and refer to the species as *Rena segrega*.

The behavior of this species is characterized by NMHS as "Primarily nocturnal and crepuscular. It spends the majority of its time burrowed underground. It is encountered on the surface crossing roadways on warm spring evenings. When captured this snake exhibits defensive behaviors that include writhing, releasing musk, and poking with its harmless tail spine."



Image above from iNaturalist for *Rena segrega*, Trans-Pecos Blindsnake. Photograph by Diana-Terry Hibbitts. Image used under provision of a Creative Commons License.

Western Long-nosed Snake

Rhinocheilus lecontei

This species is not listed on the USFS checklist, but see the NMHS website for a range map and more specific information on the natural history of this species. To quote the NMHS site, "A terrestrial snake, and a good burrower. It is nocturnal and crepuscular. If alarmed will rattle its tail and may exude blood from the cloaca and nose. Can be found on the highways at night. They have been found in every month in Arizona except February." This species is generally found in the desert scrublands and grasslands in our area.

Two subspecies of this species are recognized by some authorities. NAFHA does not list any subspecies for *R. lecontei,* perhaps following Manier (2004, *Biol. J. Linn. Soc.*, 83: 65-85).

Photographs to the right by Travis Perry.

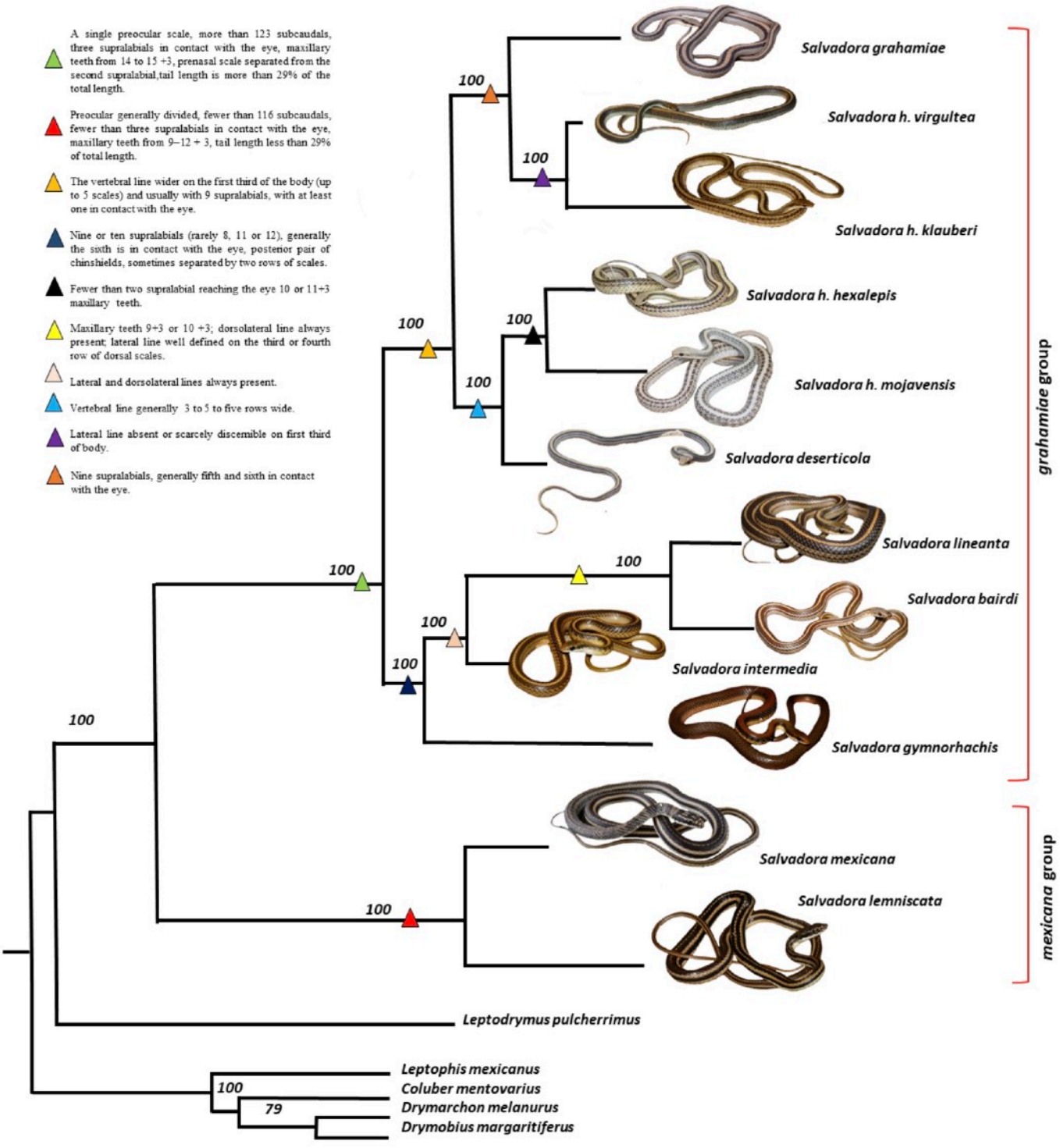




Patchnose Snakes
Salvadora

As with many other genera of snake, the taxonomic relationships of the various species in the genus *Salvadora* are disputed. When reviewing various reference material be sure to check the time of publication, because speciation decisions have been so fluid.

The following phylogenetic relationship tree was published by Hernández-Jiménez C.A., Flores-Villela O., Aguilar-Bremauntz A. & Campbell J.A. 2021. "Phylogenetic relationships based on morphological data and taxonomy of the genus Salvadora Baird & Girard, 1853 (Reptilia, Colubridae)" *European Journal of Taxonomy* 764: 85–118. p. 89. Not only does it depict the relationship between the species of Salvadora but it includes a very useful key to identification.



Big Bend Patchnose Snake

Salvadora deserticola

The USFS checklist lists these snakes as *Salvadora deserticola*, Western Patchnose Snake. NAFHA lists five subspecies of *S. hexalepis*, the Western Patchnose Snake, one of which is *S. h. deserticola*. NHMS lists this species simply as *Salvadora hexalepis*, the Western Patchnose Snake. It is one of two Patchnose snake species found in our area.

This species is fairly common in oak and oak-juniper woodlands. In the Hillsboro area, this species is most commonly found in the desert washes. They are active for somewhat longer periods than some other snake species. They can generally be found at any time between April and November.



***Salvadora deserticola,* Big Bend Patchnose Snake, Ready Pay Gulch, east of Hillsboro, NM, May 27, 2016**

In a study from 1971 ("Physiological responses to temperature in the patch-nosed snake, Salvadora hexalepis", *Herpetologica*, Vol. 27, September 1971) E. R. Jacobson and Walt Whitford found that this species tolerated a wide variance in temperature, more so than many other snake species. This capability matches that of a number of its prey and probably explains the fact that it can be found during two-thirds of the year.



Immediately Above and Below: Big Bend Patchnose Snake, Ladder Ranch, Black Range
Photographs by Megan Perry





Above: Warm Springs Wash, east of Hillsboro, Black Range, August 29, 2016







Gordon Berman took the photographs of Big Bend Patchnose Snake, *Salvadoran desertícola,* on this page. The one below is from September 30, 2019. All of the others were taken along the Sierra Vista Trail, below Bishop's Cap, on March 16, 2022.



Mountain Patchnose Snake

Salvadora grahamiae

NAFHA lists two subspecies of *S. grahamiae,* the Eastern Patchnose Snake. If you follow that taxonomic scheme, the nominate form is found in our area and is known as the Mountain Patchnose. The paper referenced four pages earlier does not recognize any subspecies of *S. grahamiae*.

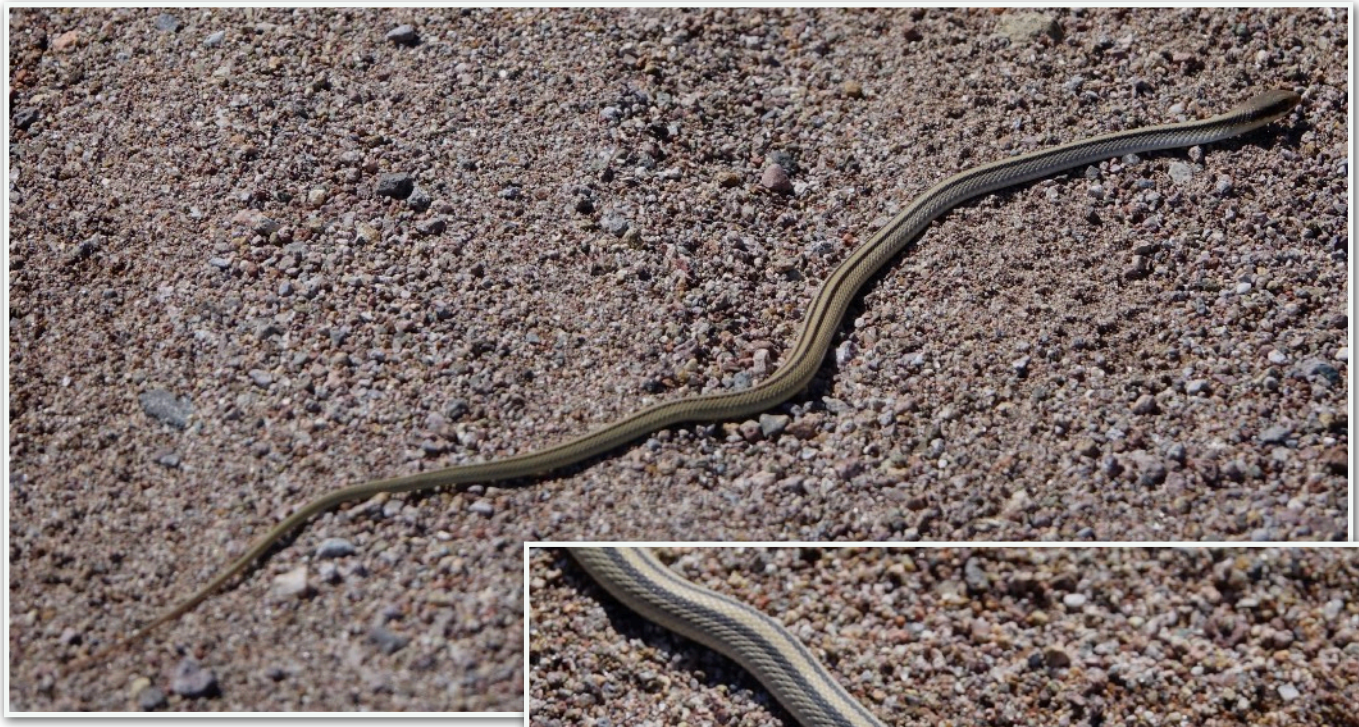
This species is uncommon and is typically found in pinyon-juniper woodlands.



Above: Mountain Patchnose Snake, Bloodgood Spring, South of Kingston, Black Range, July 11, 2017



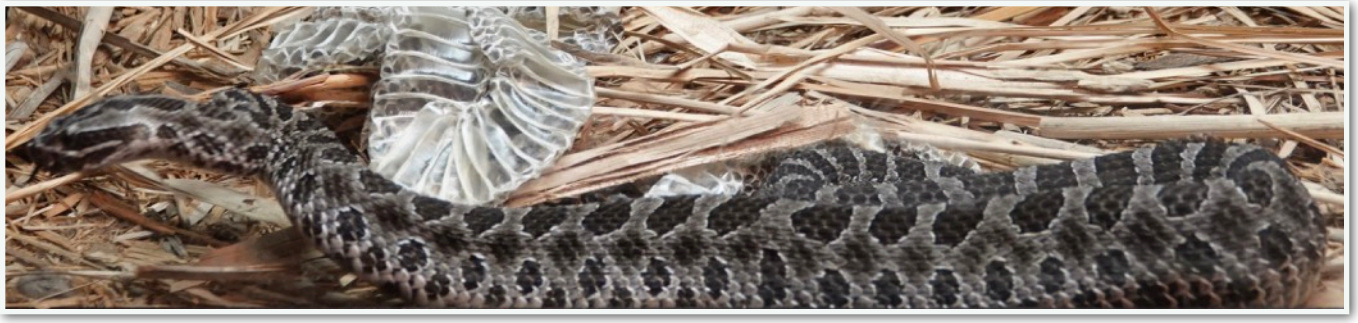
Above: Mountain Patchnose Snake, Ladder Ranch, Black Range. Photograph by Megan Perry.





Salvadora grahamiae, **Mountain Patchnose Snake, Warm Springs Wash, east of Hillsboro, NM, August 29, 2016**





Massasauga

Sistrurus catenatus

A few individuals of this species have been found in the grasslands around the Black Range. Please report any sightings.

The photograph above was not taken in the wild. There are three 'variants' of Massasauga. The one found in our area is the 'desert variant', which is lighter in color than the individual shown above. These three variants may be three species.

***Sistrurus tergeminus edwardsi*, Desert Massasauga (following NMHS). Not listed on the checklist, but see NMHS. NAFHA lists this group of snakes as a subspecies of *Sistrurus catenatus (edwardsii)*. It also lists a species named *S. c. tergeminus*, Western Massasauga.**



Groundsnake

Sonora semiannulata

This species is not listed on the USFS checklist, but see the NMHS website. NAFHA lists two subspecies. If that taxonomy is accepted, the nominate form is found in our area.

Photographs of this species on this and the following page are by Gordon Berman. Note that this species is referred to as Groundsnake or Ground Snake, depending on source.





Groundsnake range from iNaturalist.



When Gordon Berman provided these images of a Ground Snake, *Sonora semiannulata*, he described the moment before these photographs were taken: "On 8/13/2017, while kneeling about 2/3 up the west slope of Picacho Peak to snap a collared lizard under an overhang, an out of place red lay beneath me in a narrow crevice. As the red/black pattern came into focus, I kept wondering: "red, black, get back?"

This species is found in a "Striped Phase" and a "Banded Phase", and some are of a uniform color. To make things a bit more difficult, the banded phase comes in a black-and-white pattern. In the banded snakes, the black bands may or may not extend all around the body. AND, all forms may be found in the same location.

At one time, there were five recognized subspecies of the Ground Snake (based primarily on the extensive variability described above). It was found, however, that snakes of all of the above variations interbreed freely and successfully. Most sources do not recognize any subspecies at this time. It is also known as the Western Ground Snake. Some sources recognize subspecies, in which case this individual is *Sonora s. semiannulata*, the Variable Groundsnake.

This species tends to be secretive and nocturnal. Sometimes it is found in groups.

This species is not large, generally less than 20 inches in length. It is typically not aggressive and is not venomous.

Southwestern Black-headed Snake

Tantilla hobartsmithi

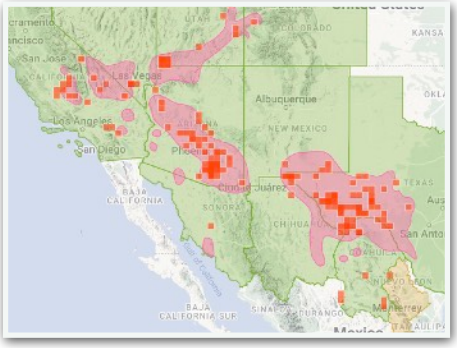
This species is also known as Smith's Black-headed Snake.

It is rare in our area and is found in desert, oak, and oak-juniper woodlands.

Given the range map, it is unlikely that you will run into this species in the Black Range. The



photograph shown here is by Philip Kline.



Southwestern Black-headed Snake range from iNaturalist.

Plains Black-headed Snake

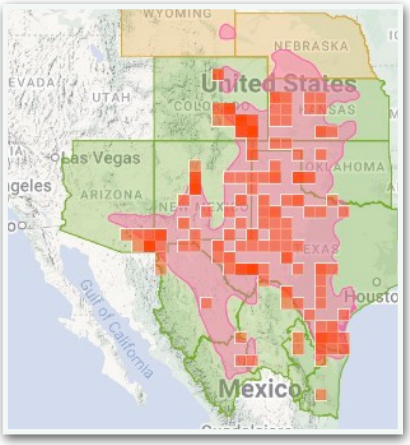
Tantilla nigriceps

Per NMHS, this is "a secretive snake that frequents brushland, grassland, creosote brush, high scrub desert, sagebrush, thornscrub, open chaparral and woodland. Attracted to stream bottoms and river bottoms." It is uncommon in desert, oak, oak-juniper, and pinyon-juniper woodlands.

The range map to the right is from iNaturalist. The two photographs, by Travis Perry, are from the Black Range.

This species is typically 7 to 15 inches in length (18-38 cm). At this length, it is one of the longer species in the genus *Tantilla*. The Plains Black-headed Snake may be especially vulnerable to desiccation and is unlikely to be found in especially dry conditions/locales.

At the moment, there are 66 recognized species of Tantilla. They are known by a variety of common names including centipede snakes, flathead snakes, or as here, blackhead snakes. Note the lack of a hyphen.





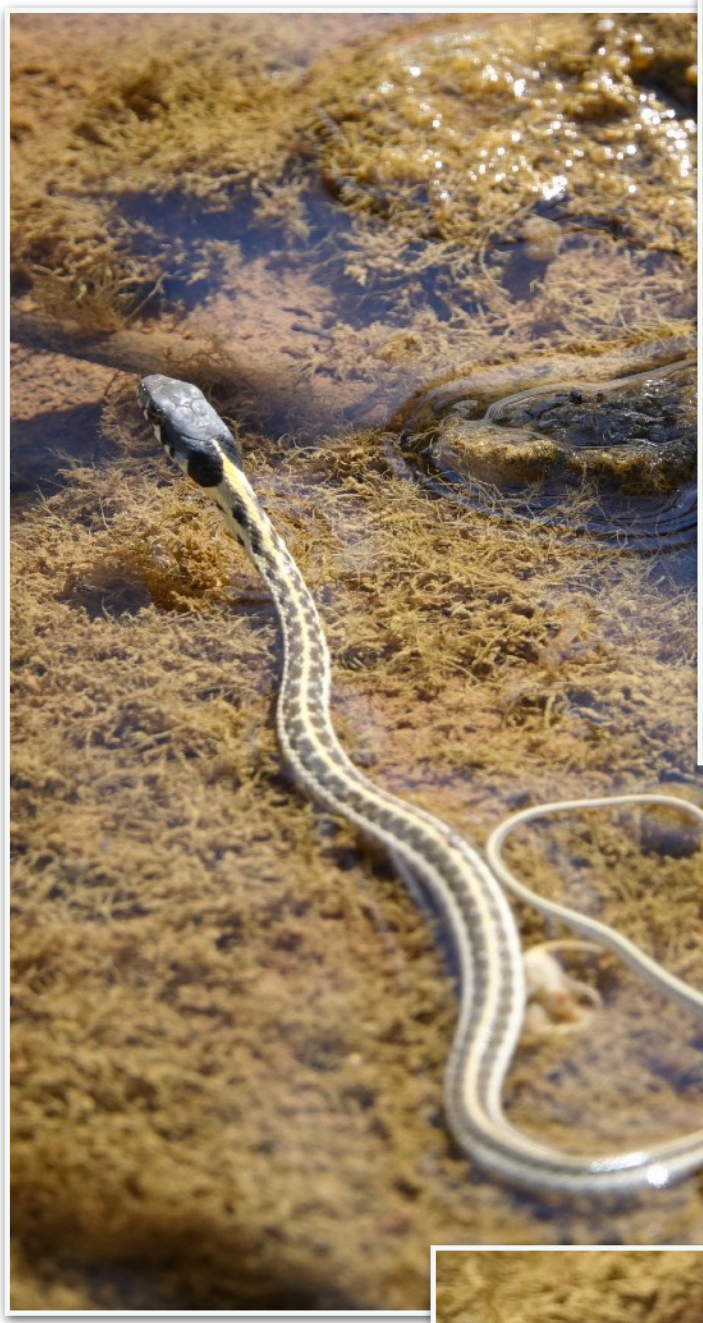




The USGS develops and provides range maps for many species within the United States as part of its Gap Analysis Project. This range map was developed as part of that effort.

Western Black-necked Garter Snake

Thamnophis cyrtopsis cyrtopsis



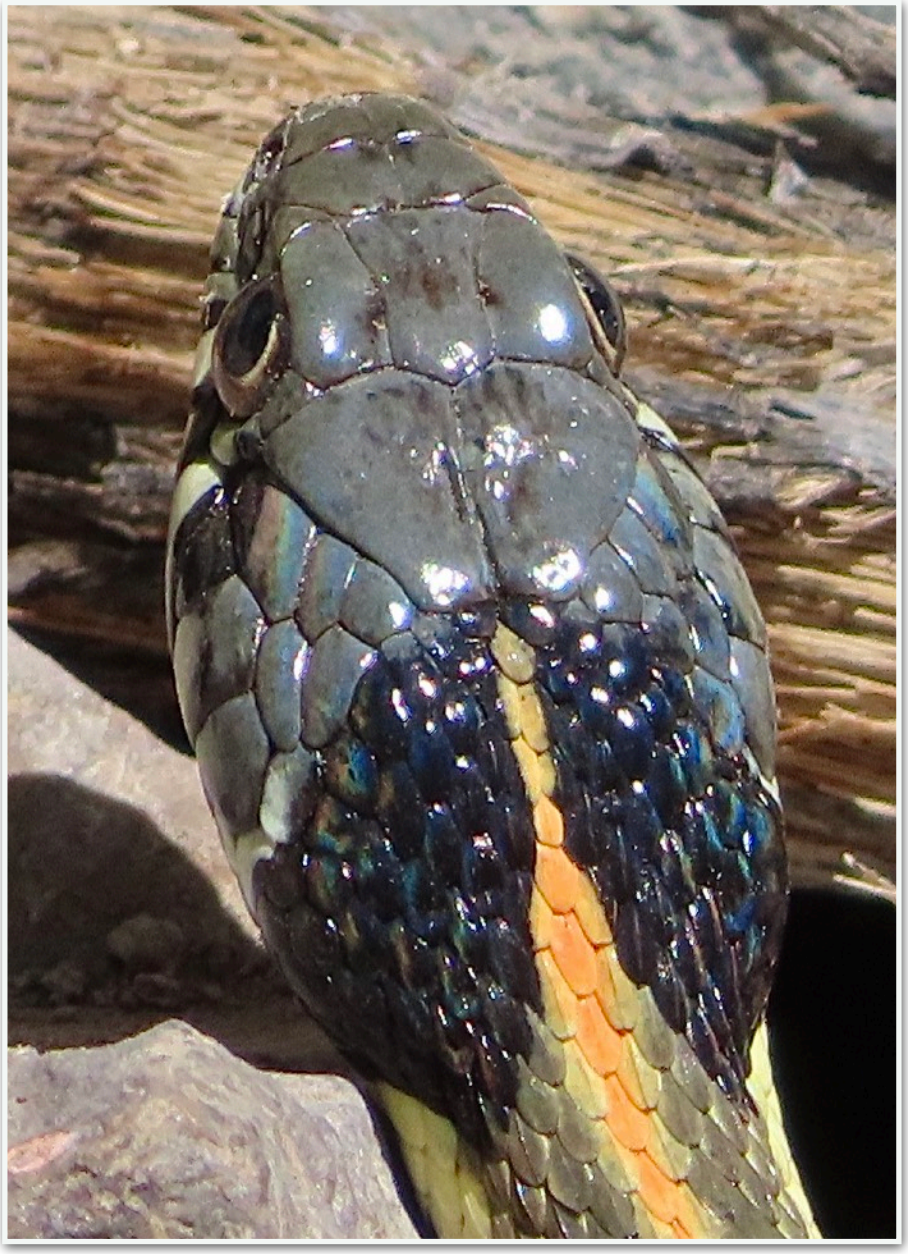


The Blacknecked Garter Snake shown on this page was photographed on July 10, 2017, swimming in Middle Percha Creek east of Kingston. The common name protocol for this species is bothersome; it may be referred to as Blackneck or Blacknecked, with/without a hyphen (Black-neck or Black-necked). The subspecies is known as the Western Black-necked Garter Snake. NAFHA recognizes 3 subspecies.

















Photographs on this page
by Gordon Berman

Western Black-necked Garter Snake
Thamnophis c. cyrtopsis

Above: May 2, 2022, at the base of Fillmore Canyon Waterfall, Organ Mountains.

Left: October 22, 2022, in Valles Canyon.

Western Terrestrial Garter Snake (Wandering Gartersnake)

Thamnophis elegans vagrans

Other English common names include Garden Snake, Gardener Snake, Terrestrial Garter Snake, and Grass Snake. This species is common in deciduous riparian and coniferous riparian woodlands. NAFHA lists four subspecies of Terrestrial Garter Snake, others list six. iNaturalist lists five subspecies. The California Herps map below shows the range of the species within the United States, delineating four subspecies. The subspecies found in the Black Range is *T. elegans vagrans*, Wandering Gartersnake (dark blue on the map).

Snakes in this genus are "ovoviviparous" meaning that these snakes produce eggs, but the eggs remain inside the body until they hatch. The mis-application of that term has led to its general disuse in today's literature.

Photographs below are by Megan Perry from the Black Range Crest trail between Reed's Meadow and Squeaky Spring.



The photographs above and at the left on the following page are from Wright's Cabin in the Black Range.













Wandering Gartersnake, Wright's Cabin in the Black Range.

Checkered Garter Snake

Thamnophis marcianus marcianus

The subspecies is known as Marcy's Checkered Garter Snake. It is fairly common in deciduous riparian woodlands.



Checkered Garter Snake, in the Black Range by Travis Perry.

There are two subspecies of Checkered Garter Snake, or if you wish, Gartersnake. The nominate form is found in the Black Range.

***T. marcianus* produces a mild neurotoxin as a venom which it delivers through a chewing action. The venom is apparently not potent enough, and not enough is produced, to cause significant harm to humans. It probably does affect the small amphibians and fish on which it feeds.**

Mexican Garter Snake

Thamnophis eques

This species is not listed on the USFS checklist, but the NMHS website lists this species from Grant County. It is not clear if this species is found in the Black Range. The range map to the right was produced by the USGS Gap Analysis Project.

The photograph to the right was taken by Kris Ohlenkamp near Sierra Vista, Arizona.

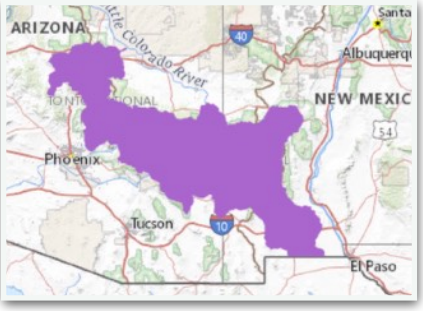




Narrow-headed Garter Snake

Thamnophis rufipunctatus

This species is also known as Narrowhead Garter Snake and Narrowheaded Gartersnake. The NMHS website lists this species for Grant but not Sierra County. The USGS range map for this species indicates that it is probably found in Sierra County.



This species is uncommon in open marshes and deciduous riparian woodlands.

There are three subspecies of *T. rufipunctatus* which are recognized by some authorities. All three may be full species.

The NMHS website warns that this species is protected and that it should not be harassed or collected.



Narrowhead Garter Snake, photograph by Kathleen Slocum
Gila River, Grant County.

Common Garter Snake

Thamnophis sirtalis dorsalis

This species is not listed on the USFS checklist but the NMHS website indicates that the range of this species includes Sierra County.

The NAFHA website lists twelve subspecies of Common Gartersnake.

The range map below shows the ranges of the subspecies, including that of *T. s. dorsalis*, the New Mexico Garter Snake (circle added).



Among the prey of the Common Garter Snake is the Rough-skinned Newt (*Taricha granulosa*). This newt secretes a toxin which can kill humans, but not the garter snake, if they ingest it. The Common Garter Snake is not totally immune to the tetrodotoxin of the newt, however. When the snake consumes the newt its (the snake's) speed is reduced to the point that it may not move for quite some time and its ability to thermoregulate its body is reduced. The snake is able to incorporate the toxin into its own body, assumedly making it less desirable to those species that might prey on it. There is an evolutionary twist to this story. The newt does not naturally occur within the range of *T. s. dorsalis*. Common Gartersnakes that live in areas where the newt is present have higher tetrodotoxin resistance levels than those snakes which do not live where the newt is present.



Common (New Mexico) Garter Snake, photograph by Bud Lensing
Bosque del Apache NWR, NM

Sonoran Lyre Snake

Trimorphodon lambda

This species is not listed on the USFS checklist, but the NMHS website indicates the range of this species includes Grant County. The NAFHA website lists this species as a subspecies of *T. biscutatus*, the Western Lyresnake.



Range of the Sonoran Lyresnake. California Herps

The HMHS website states that the two species of Lyre Snake listed here are best distinguished by range. The two species apparently hybridize in the extreme southeast of Arizona/ southwest of New Mexico.



Photograph of a Sonoran Lyre Snake by Nick Pederson. New Mexico Boothill.

Chihuahuan Lyre Snake

Trimorphodon vilkinsonii

This species is not listed on the USFS checklist, but the NMHS website indicates the range of this species includes Sierra County. The NAFHA website uses Texas Lyresnake as the English common name for this species. The range of the Chihuahuan Lyre Snake (Texas Lyresnake) is shown on the USGS map to the right.





Photograph of a Chihuahuan Lyre Snake by Travis Perry. Black Range.

Most of the World's Human Population is at Least Bilingual - Part 2

Here we continue the effort started in this year's April issue to explore insights about the fauna of the Black Range, as reflected in the common names used to describe them in non-English languages.

In this listing, we have tried to restrict our terminology listings to the Spanish of northern Mexico and New Mexico. The geographic range within which a term is used is often unclear, however. We have tried to assure that Spanish names used exclusively elsewhere are not listed.

This listing focuses on the terms which may be useful to birders, ornithologists, or casual observers and those interested in the study of natural history generally. It is not a definitive listing of terms related to the general topic but rather a listing that will "get your foot in the door". It does not (generally) contain the literal translation of the terms from one language to another, the exceptions being the fairly rare cases in which terms happen to be the same, word for word, in both languages. For instance, it does not list Acorn Woodpecker as Carpintero Bellotero. For that type of information see Edwards (source listing) and *Aves De México* a publication of CONABIO, *Native Names of Mexican Birds* (USFWS), or a site like Audubon's Spanish Language Field Guide.

Some of the Mexican Spanish terms listed here are those generally used by individuals who are not versed in natural history. As such, they are often imprecise, and one term may have multiple uses. In addition, some of the linguistic authorities who published the source material we used are not naturalists. For instance, pájaro piñonero is defined by Cobos as "bluejay". Bluejay, as a generic English term, is not helpful since it can refer to any of several species. In determining that this term refers to Pinyon Jays we note that Cobos defines piñonero/ra as a person who gathers piñons. Therefore, pájaro piñonero is a bird that gathers piñons - a Pinyon Jay. There are other species which eat piñons, but note the phrase "blue" in Cobos' translation.

Some of the terms listed here have origins in the languages of the indigenous peoples of this area. Those languages have not been studied as rigorously as English and Spanish, in such cases, the written sources we used may not have been as accurate as we hope they are.

A lack of knowledge does not indicate a lack of diligence. A report that a person has sighted a bluejay, when in fact it was a Pinyon Jay, does not change the fact that a Pinyon Jay was sighted. It means only that the terminology must be sorted.

In English-speaking North America we have the benefit of standardized English common names with which to describe birds. The Spanish-speaking Americas do not have that benefit; standardization of common bird names has not happened. Although English speakers tout this standardization, it does not change the fact that when a person sees a Robin in Hillsboro and a person sees a Robin in England they will have seen different species.

The etymology of Spanish names provides numerous clues into how the early peoples viewed the natural history of this region. Whereas English common names tend to focus on field marks of the bird in question or honor an early naturalist, Spanish names tend to describe bird behavior. (See nighthawk in the listing, for instance.) When we have ferreted those factoids out, they are listed in the notes section.

In general, specialty dictionaries are needed to decipher the possible meanings of many of the Spanish common bird names.

English is often the lingua franca of the birding world in the Americas. Among the more serious birders, and among ornithologists, the Latin binomial (scientific species name) is used. Pronunciation of English common names by non-native speakers can sometimes be different than that expected by native English speakers, as can the pronunciations of indigenous and Spanish terms by English speakers. In those cases where three or more languages are involved (an indigenous term translated into Spanish, and then into English, for instance) ample opportunity exists for mispronunciation and/or misunderstanding.

This listing is a sampler; to be comprehensive would require volumes.

Some Sources Utilized in Parts 1 and 2

S. White - Spanish Names For Kinds of North American Birds

Garland D. Bills & Neddy A. Vigil, The Spanish Language of New Mexico and Southern Colorado - A Linguistic Atlas, University of New Mexico Press, Albuquerque, 2008

Rubén Cobos, A Dictionary of New Mexico & Southern Colorado Spanish, Museum of New Mexico Press, Santa Fe, 2003

Referred to as "Harrington" *The Pueblo Indian world; studies on the natural history of the Rio Grande Valley in relation to Pueblo Indian culture, edited, adapted, and amplified by Edgar L. Hewett and Bertha P. Dutton; with appendices: The Southwest Indian languages and The sounds and structure of the Aztecan languages, by John P. Harrington*. 1945

An English-Spanish Glossary of Terminology used in Forestry, Range, Wildlife, Fishery, Soils, and Botany (Glosario en Ingles-Espanol de Terminologia usados en Forestales, Pastizales, Fauna Silvestre, Pesqueria, Sueolos, Y Botanica), Alvin Leroy Medina, Rocky Mountain Research Station, 1988.

Spanish Names for Kinds of North American Birds (webpage)

Ernest P. Edwards, A Field Guide to the Birds of Mexico, Second Edition, Self-published, 1989 (link is to 3rd Ed.)

Programa de América Latina para las Aves Silvestres - Manual ilustrado para el monitoreo de aves silvestres (PROALAS)

Check List of the Birds of Michoacan (webpage). Includes many species found in the Black Range (Latin binomial, English, multiple Spanish terms). Also, Bird List of Mexico (webpage, same site, scroll down).

Native Names of Mexican Birds, Lillian R. Birkenstein & Roy E. Tomlinson, US Fish and Wildlife Service, 1981

A Thesaurus of Bird Names, Michel Defayes, Website

webonary.org is a listing of the dictionaries of less familiar languages. Some from North America include: Tének (spoken by about 150,000 people in San Luis Potosí and Veracruz, Mexico); Comanche (spoken by 100 people or fewer); Copala Triqui (spoken by about 25,000 in central Mexico), etc.

Note and Disclaimer From the Copy Editor
by Rebecca Hallgarth

This entry, with credit to Alexander Pope, might very well be titled, "A little learning is a dangerous thing." Both Bob Barnes, the author of the following entry ("A Few Terms Used in Natural History - English/Spanish") and I have limited acquaintance with the Spanish language, so undertaking the listing shows a lot of optimism, if not a lot of foolhardiness, chutzpah, or some similar term. We know that it's likely to contain errors and misunderstandings, and we'd appreciate any comments that would improve its accuracy.

With that said, we did find it absorbing to assess the accuracy of the names of species listed in our sources and to try to tease out the thoughts behind them. The accuracy of many of our sources was unquestionable, but how others were compiled was more opaque. We resorted to multiple dictionaries – a variety of English to Spanish, Spanish to English, and Spanish-only dictionaries – and learned a lot along the way.

As Bob points out below the common names of animals and plants aren't often word-for-word translations from one language to another. When they are, it's most likely that the speakers have independently arrived at the same descriptions – for example, "climbing" in English and "trepador/a" in Spanish for plants or animals that climb.

A slightly more complicated example is the term for the American Robin (*Turdus migratorius*) in Spanish and in English. In both cases, New World speakers borrowed a name from the European Robin (*Erithacus rubecula*), a very different bird, because both the European and American "robins" have red breasts. "Robin redbreast" is sometimes heard in English-speaking areas, while "petirrojo" is heard in Spanish. According to the *Diccionario de la Lengua Española,* published by the Royal Spanish Academy, "petirrojo" comes from the words "peto" - a breast plate or, modernly, a bib – and "rojo", or "red". Two species, two continents, two languages, two "redbreasts".

A Few Terms Used In Natural History - English/Spanish

Badger, American

Latin binomial: *Taxidea taxus berlandieri,* is the subspecies found in the southwestern U.S. and northern Mexico.

Spanish: tlalcoyote, tejón (also used for coati)

Bat

Spanish: ratón volador (flying mouse), murciélago

Bear

Spanish: oso, joso (regional variant)

Blackbird

Spanish: mirlo; chanate. Chanate from tzana-tl (Náhuatl)

Blackbird, Red-winged

Latin binomial: *Agelaius phoeniceus*

Spanish: turpial de agua; tordo sargento (sargento probably refers to the red "epaulettes" on the wings of this species).

Bluebird

Latin binomials: *Sialia sialis, S. mexicana, S. currucoides*

Spanish: *azulejo*

Azulejo is a color/type of ceramic which was brought to Mexico by the Spanish. The word "azulejo" is derived from the Arabic word zillīj" (زليج) and does not explicitly refer to blue (azul). The Talavera of Puebla is a famous example of the ceramics produced in this style, and they feature blue. The common Mexican name may refer to the color of Talavera from Puebla. "Azulejo" may also refer to "blue jay" (undifferentiated), but blue jay is generally "arrendajo azul" or "urraca azul".

Bushtit

Latin binomial: *Psaltriparus minimus*

Spanish: sastrecito; sastre (tailor, perhaps because of its woven nest).

Butterfly

Spanish: mariposa, paloma

"Paloma" is a dialect usage; generally the term refers to "dove". "Paloma" and the diminutive "palomita" are sometimes used to refer to "moth" (see Bills). The diminutive "palomilla", is also used to mean a small butterfly.

Buzzard

Spanish: buitre; chupilote; zopilote; aura

Náhuatl: zopilote from tzopilo-tl

Generally assumed to refer to Turkey Vulture rather than the various buzzards.

Cardinal, Northern

Latin binomial: *Cardinalis cardinalis*

Spanish: cardenal, Ave de copete rojo (bird with the red crest or tuft).

"Cardenal" may also be used to refer to a variety of red birds including Summer Tanager. There are a number of cardinal species (with crests) in Spanish America.

Centipede

Spanish: , ciempié(s); santopié (regional, New Mexico)

Chickadee

Spanish: paro; carbonero

"Carbonero" also refers to words associated with coal and to (tufted) titmouse.

You may see that "dulzura" means "chickadee" in Spanish. Yes, but in the sense of "come here, my little chickadee".

Coati, White-nosed

Latin binomial: *Nasua narica narica*

Spanish: coati, tejón

As with many common names, tejón, as used in Mexico, is not necessarily species specific. In English this species is often known by either Coati or Coatimundi. Coatimundi is a Tupian word (Brazil). In Tupian, it means a lone coati (generally a bachelor male). That distinction is generally lost in English and Spanish, where the word is interchangable with coati.

Coot (American Coot and others)

Spanish: fúlica; gallareta

Fúlica refers generally to any of the coots, and there are many in the Americas.

Cowbird, Brown-headed

Latin binomial: *Molothrus ater*

Spanish: tordo cabeza café (literally: brown-head thrush).

Coyote

Spanish: coyote

Nahuatl: coyote

Crane

Spanish: *grúa; grulla/grullo*

Náhuatl: toquilcoyote

Specifically to Sandhill Crane in NM but generally to the type of bird.

Creeper, Brown

Latin binomial: *Certhia americana*

Spanish: trepadorcito (little climber); carpinterito (referring to a small woodpecker); cortecerito (little one of the bark); carpintero ocotero; saltadorcito

Crossbill

Spanish: piquituerto (literally, "twisted beak").

Crow

Spanish: cuervo

Tewa: *'ondo* for both crow and raven

Harrington noted that *cuervo* applied to both ravens and crows

Cuckoo

Spanish: cuco (Cuco can also mean sly or crafty, used for cuckoo because of the manner in which it conducts its parasitism.); cuclillo

Cuckoo, Yellow-billed

Latin binomial: *Coccyzus americanus*

Spanish: abejaruco (bee eater)

Dove

Spanish: paloma; maraguita; tórtola; tortóla

La paloma: This term, used to refer to dove, is assumed to be derived from the latin term for "wood pigeon" (palumbus, palumbēs). Some sources imply that tortóla may refer exclusively to turtle-doves; most use it more generally for all doves.

Paloma is also used, in at least one dialect, to refer to butterfly.

Palomita is used to refer to, among other things, little dove.

Pichón sometimes refers to a young pigeon or dove.

Dove, Inca

Latin binomial: *Columbina inca*

Spanish: tórtola; cucu; featu; conguita; conquito

Names with Náhuatl origins include cocotli.

Dove, Mourning

Latin binomial: *Zenaida macroura*

Spanish: hortola coluda; llorona; montera; tiuta; kuikipu; huilota

Nahuatl (?): huilota comun (happens to be the general "Spanish" usage); huilotl;

In Tewa, this species of dove may be associated with rain. Names with Náhuatl origins include Uilotl; huilota comun (Common Hilota) simply refers to relative abundance; huilota = dove.

Dove, White-winged

Latin binomial: *Zenaida asiatica*

Spanish: torcaz; tortola; pitallera; tunera; cocolera; tehuacanera; cucu; tora; chicalotera; Limonera

Various names paloma and huilota, see Brickenstein; names with Náhuatl origins include cehoilotl. Some names, such as "pitallera", are related to eating cactus fruit.

Duck

Spanish: pato

Has numerous other, non-avian, meanings - 'Ovi (Tewa) refers to wild and domestic ducks.

Eagle

Spanish: águila

Tewa: *Tse* in Tewa, meaning Chieftain Bird

Eagle, Bald

Spanish: Águila Cabeciblanca (white-headed eagle) describes the adult bird.

Earthworm

Spanish: lumbriz, gusano

Also lombriz, lumbriza, and lumbricia

Ewe

Spanish: borrega, oveja

Finch

Spanish: pinzón; fringílido

Fish

Spanish: pez; trucha; pescado

"Pez" is the standard word for "fish" in Spanish-speaking areas in general. In most locales trucha refers only to trout, but it appears widely in northern New Mexico as a general word for fish. In southern New Mexico, including the Black Range counties of Grant and Sierra, the word "pescado" has been reported widely as an equivalent of "pez", though in standard usage, it means only fish as a food - not live fish. (See Bills & Vigil.)

Flicker, Northern (Red-shafted)

Latin binomial: *Colaptes auratus cafer*

Spanish: pica-pico lombricero; pico cobrizo, colápo

pica-pico = a spear-like beak

Flycatchers

Spanish: papamoscas; mosquero; abejero; mosquerito; tirano

A note of caution. Copetones is listed as a word used for flycatcher at the link indicated. This may be true in some locales but the term is generally used for a sparrow, specifically the Rufous-collared Sparrow. The listing at the link is probably an error. It may have resulted from misinformed informants, linguists who are not naturalists, or other reasons. The point here is that in an undertaking of this sort errors occur - in all sources.

Flycatchers, Tyrant

Spanish: tirano

"Tyrant". Tyrant Flycatchers are a species group.

Flycatcher, Vermilion

Latin binomial: *Pyrocephalus rubinus*

Spanish: cardenalito; brasita de fuego; sangre de toro; colorín; chapaturín; petirrojo; torturrijimo; tlapalito; tibicí

Náhuatl: tlapaltótotl

Cardenalito = little cardinal; perhaps to confuse things, petirrojo translates as robin

Gnatcatcher

Spanish: perlita; encinerito; pisita

Goose

Spanish: ansar; ánsara; ganso (Birkenstein p. 12)

Many use pato (duck); ánsara is probably archaic, used to describe large migratory birds.

Grackle

Spanish: zanate; clarinero; chanate

Chanate from tzana-tl (Náhuatl)

Grackle, Great-tailed

Latin binomial: *Quiscalus mexicanus*

Spanish: chanate; zanate

Mexican Grackle; Chanate from tzana-tl (Náhuatl); Zanate throughout Mexico; chanate primarily in the north.

Grasshopper

Spanish: chapulín - used in large areas of Latin America, but the standard Spanish word is "saltamontes" - from chapol-in (Nahuatl)

Grosbeak

Spanish: picogrueso; picogordo; Realejo refers to Rose-breasted Grosbeak (*Pheucticus ludovicianus*)

Hawk

Spanish: aguililla; guaraguíto; gavilán; halcón

Gavilán and aguililla are general terms for hawk

Hawk, Common Black

Latin binomial: *Buteogallus anthracinus*

Spanish: Aguilucho Cangrejero

This species preys heavily on crabs, or in our area, crawfish. Cangrejero means "crab-catching".

Hawk, Red-tailed

Latin binomial: *Buteo jamaicensis*

Spanish: Aguilucho Cola Roja (descriptive in English and Spanish)

Hawk, Swainson's

Latin binomial: *Buteo swainsoni*

Spanish: Aguilucho Langostero

Describes feeding behavior ("langosta" + "locust"). It is sometimes known in English as the Grasshopper Hawk or Locust Hawk because those insects are a staple of its diet.

Hawk, Zone-tailed

Latin binomial: *Buteo albonotatus*

Spanish: Aguilucho Aura (Describes its similarity in appearance to Turkey Vulture [*Aura*].)

Heron

Spanish: garza; garcita; airón

Garza is a term used for egrets and herons, see Birkenstein, p. 10.

Honeybee

Spanish: abeja, avispa, ovispa, cormena, colmena

Note: All are used in parts of the Southwestern U. S. for "honeybee". Abeja is the standard Spanish word for "honeybee"; "avispa" is the standard word for "wasp".

Hummingbird

Spanish: colibrí; chuparrosa (sucks flowers); zumbador or zumbadorcito (refers to the buzzing of the wings - akin to "hummer"); tominejo (The tomino was the weight of the smallest measure of the Conquistadores.)

Jay

Undifferentiated. Many users lump all of the eastern and western species of jay together as "blue jay".

Spanish: chara; arrendajo; grajo; querre-querre; urraca (urraca = magpie); azulejo (See Bluebird, Azulejo may also refer to "blue jay" [undifferentiated], but blue jay is generally "arrendajo azul" or urraca azul".)

Jay, Pinyon

Latin binomial: *Gymnorhinus cyanocephalus*

Spanish: pájaro piñonero

Pájaro piñonero is a bird that gathers piñons, a Pinyon Jay. Cobos translates pájaro piñonero as "blue jay" or "blue crow", perhaps simply repeating the error of his source who was not versed in natural history and did not know that there are no Blue Jays here. Harrington noted that the Tewa also used *piñonero* for the Woodhouse's Scrub-Jay.

Kingbird, Cassin's

Latin binomial: *Tyrannus vociferans*

Spanish: tirano gritón (screaming tyrant); madrugador chilero (in Guatemala this translates as "awesome early riser" but in Mexico chilero is a derogatory even vulgar term); picacuervo; posera; chituri gritón; chinera; churio; tiamaría; chalangandina (*Issue 534 of Birds of North America*)

The name "picacuervo" (raven pecker) is a good description of this species, as individuals group together to harass and chase off ravens. The call of this bird can sound very much like the word "tiamaría".

Edwards, see source listing, indicates that the Spanish term for this species is Madrugador chilero and the term is used in the United States, Mexico, Guatemala, and Honduras. But note the caution identified in the "Flycatchers" entry.

Kinglet

Spanish: régulo; reyezuelo; abadejo

Killdeer

Spanish: Chorlo Tildío and many others. Generally referring to the "noise" this species makes.

Lizard

Spanish: lagartija

Lagartija can also mean "push-up" (many lizards move their body up and down during display and for other reasons). In some locales, lagartija is very specific to geckos.

Macaw

Spanish: guacamayo

Tewa: tanyi

Harrington noted the Tewa called them *tanyi* and that the Tewa said they were obtained from Mexico in former times.

Marrow

Spanish: tútano (probably archaic); tuétano

Mallard

Spanish: ánade real

Meadowlark

Spanish: pradero; sabanero ("of the savannah", describing the species' habitat) Tortilla-con-chile, which is said to be an imitation of the bird's call (onomatopoeia). In this case, the call being imitated is most likely that of the Chihuahuan Meadowlark, which was previously known as the Lilian's subspecies of the Eastern Meadowlark.

Mockingbird

Spanish: centzontle; cenzontle; censontle; censoncle; tzentzontli; sinsonte; paraulata arrendajo; chinchonte; chonte

Chinchonte: from (Náhuatl) centzontlatoltolotl (or centzontli), bird with 400 voices, in NM often shortened to chonte. Sinsonte: bird of a hundred voices. Probably referring to the Northern Mockingbird, but there are several species of mockingbird south of the United States.

Mouse

Spanish: ratón

Moth

Spanish: mariposa; polilla; palomita; paloma

Mosquito

Spanish: mosquito; jején; moyote; mosco.

Also moisco (variant of mosco) and zancudo (infrequent in New Mexico, but the standard term in some Latin American areas); moyote from Nahuatl moyo-tl

Nighthawk

Spanish: chotacabras; cabullero (this term may be particular to the Pauraque); durmilón

Durmilón is defined by Cobos (p. 87) as a small hawk that sleeps on tree branches; nighthawks are noted for their habit of perching along the length of a branch, something early observers noted as atypical for birds. Note that Cobos listed "durmilón" not "dormilon" which is more generally used for "sleepy".

Nightjar

Spanish: chotacabras; tapacamino; caprimúlgido; gallina ciega (blind hen); añapero; zumaya (esp. in South America)

Nuthatch

Spanish: trepador; sita; saltapolos

a 'creeper bird"

Oriole

Spanish: bolseros ("bag makers" - referring to their nests); chorcha; chiltote (refers to the orangish color)

Oriole, Hooded

Latin binomial: *Icterus cucullatus*

Spanish: turpial enmascarado

***enmascarado* = masked. Turpial is also the common English name for a species of oriole found in South America**

Osprey

Spanish: El águila pescadora

Fishing eagle

Owl

Spanish: tecolote (from tecolo-tl [Náhuatl]); lechuza; búho (usually used to describe large owls, often those with feather tuffs that look like upright ears - brown in color).

Owl, Barn

Latin binomial: Tyto alba

Spanish: lechuza mono; lechuza común; lechuza de campanario (refers to belfry, referring to the nesting habits of this species).

Náhuatl = Yohoaltecolotl

As in English, a name which contains common (común) does not necessarily indicate abundance.

Owl, Burrowing

Spanish: lechuza; tecolote; chicuate

***lechuza* generally refers to smaller, and lighter colored, owls. In Tewa the name for this species translates to "prairie dog owl".**

Owl, Elf

Spanish: tecolotito

This diminutive of *tecolote* is from *tecolo-tl (Náhuatl).*

Owl, Flammulated

Spanish: tecolote

As above, "*tecolote*" is from *tecolo-tl (Náhuatl).*

Owl, Great Horned

Latin binomial: *Bubo virginianus*

Spanish: tecolote corundo; tecolotón; gran duque; buho grande; buho real

Owl, Long-eared

Spanish: búho

Owl, Screech

Spanish: tecolote

tecolote* is from *tecolo-tl (Náhuatl)

Owl, Short-eared

Spanish: búho; mochuelo

Pewee

Spanish: contopus

C*ontopus* refers to the genus.

Phoebe, Black

Latin binomial: *Sayornis nigricans*

Spanish: mosquero; papamoscas; aguador.

Cobos [p.7] refers to aguador as a "ditch boss" as in mayordomo de acequias. That analogy fits the behavior of a Black Phoebe. Mosquero (flycatcher) and papamoscas (flycatcher - literally fly gobbler or sometimes fly trap), thus *papamoscas negro* and *mosquero negro*.

Phoebe, Say's

Latin binomial: *Sayornis saya*

Spanish: mosquero; *atrapamoscas llanero* (also refers specifically to the Amazonian Scrub-Flycatcher); papamosca boyero.

***Atrapamoscas* is a flytrap, *llanero* is "of the plains" - descriptive of Say's Phoebe habitat.**

Pigeon

Spanish: paloma; pichón

Paloma when used generally often refers to doves.

Pigeon, Band-tailed

Latin binomial: *Columba fasciata*

Spanish: cuauhpaloma; torcaz ocotera; pinchón de collar; habanera; huertera; kepún

Poorwill

Spanish: tapacamino, and others English: Generally the Common Poorwill (*Phalaenoptilus nuttallii*) but known in Spanish by the English name Pachacua Nightjar.

Porcupine, North American

Spanish: cuerpoespín, puercoespín, cuerpoespino

Quail

Spanish: gallina de la tierra; gallineta

***gallina de la tierra* defined by some as "native fowl" and also used to refer to turkey and roadrunner**

Quail, Gambel's

Latin binomial: *Callipepla gambelii*

Spanish: cuiche; cuichi; chiquiri

***codorniz* = quail - Codorniz de Gambel is simply a verbatim translation**

Cuichi also refers to chachalaca in western Mexico.

Quail, Montezuma

Latin binomial: *Cyrtonyx montezumae*

Spanish: perdiz de la sierra; perdiz góngoro; cincorreal; cinco real;

cutizinga pinta, Codorniz Encinera, Codorniz Pinta

Various combinations using *codorniz;* perdiz is a partridge, also refers to tinamou. Both Cinco Real and Codorniz are given as vernacular names for the Singing Quail of Mexico by Paul A. Johnsgard.

Quail, Scaled

Latin binomial: *Callipepla squamata*

Spanish: cuiche; cuichi; tostona, Cordorniz Azul, Codorniz Escamosa

In *Náhuatl: tecuzollín; ouatón;* zolín (may be spelled zollín). Colinus, the genus of four North American bobwhites is a term from the Spanish version of zolín, which is colín. (Johnsgard)

Rabbit

Spanish: Conejo

Rattlesnake Weed

Various Pueblo Languages: coyaye

Raven

Spanish: cuervo

Cuervo is applied to both ravens and crows - Common Raven = cuervo de la sierra. Harrington noted that the Tewa used *'ondo* for both crow and raven.

Roadrunner, Greater

Spanish: correcaminos; paisano; gallina de la tierra; gallineta; pájaro vaquero; vaquero; chura; faisán; arriero

Gallina de la tierra is defined by some as "native fowl" and is also used to refer to pheasant and turkey. Often called Chaparral Bird or Chaparral Cock by early English speakers in the Southwest.

Robin

Spanish: petirrojo americano
Interesting because "petirrojo" refers to the Robin found in Europe. "Robin" was used for the American Robin when the first English colonizers arrived in what is now the United States (they are different species - not even closely related). This Spanish usage parallels the English.

Calandria is sometimes used to refer to American Robin; it means "lark".

Shrike

Spanish: verdugo; alcaudón; inquisidor (may be limited to Chiapas); cartero (may be limited to Jalisco)

"Verdugo" means "executioner" in Spanish, not too different from the idea behind the informal English name "butcher bird".

Siskin

Spanish: lúgano; jilguero lúgano; lugano

Snipe

Spanish: pico largo

Solitaire

Spanish: clarín

Townsend's Solitare: Clarín Norteño (*Myadestes townsendi*)

Titmouse, Bridled

Spanish: copetoncito; mascarita; obispillo

Nahuatl: chiquín, chiquirí

Turkey, Wild

Spanish: pavo; guajolote; guajalote; gallina de la tierra; gallina de la sierra; ganso; torque; cócano; cócono; güíjalo; güíjolo; guanajo; totole

See Bills for extensive discussion; *Náhuatl - huehxolo-tl; gallinas de la tierra* defined by some as "native fowl" and also used to refer to pheasant and roadrunner; guajolote from Náhuatl uexolotl refers to a male turkey as does *güíjolo*.

Per John P. Harrington in *The Southwest Indian Languages*: *tshi (*Keresan), *Tewa ndi* (Tanokiowan), *to-* (Zunyian), *tootoo-* (Aztec - but possibly just "bird") - *Ndi* is probably Merriam's Turkey

Verdin

Spanish: copetoncito (also used for some titmouse and sparrow species); Valconcito (p. 63, Birkenstein)

Vireo

Spanish: vireo; vireon

Vulture

Spanish: buitre; aura; carroñero; chupilote; zopilote (Mexico);

Vulture, Turkey

Spanish: Aura; Aura Cabeza Roja

"Cabeza roja" refers to red head of adult.

Warbler

Spanish: chipe; chirpe; reinita; gorjeador; picito; silvia. (See p. 75 of Birkenstein)

Wasp

Spanish: avispa, ovispa

Waxwing

Spanish: ampelis; capuchino

Wing

Spanish: ala

Woodpecker

Spanish: carpintero, chejé (The Audubon website uses this term for the Golden-fronted Woodpecker, referring to it as Carpintero Cheje in Spanish and translating that as Cheje Woodpecker [something like the Rio River]); pico (referring to the bill)

Woodpecker, Acorn

Latin binomial: *Melanerpes formicivorus*

Spanish: carpintero encinero (c. de bellota, c. tigre); picamadero ocotero (perhaps primarily Chiapas); chicata (primarily Michoacán)

carpintero = woodpecker; picamadero appears to be a more localized word meaning woodpecker

Woodpecker, Ladder-backed

Latin binomial: *Dryobates scalaris*

Spanish: carpintero (a term not limited to woodpeckers, but to a great many species which creep up and down trunks); carpintero chilillo; carpinterocillo (apparently only used for the Ladder-backed but may be limited to Tres Marias); Carpintero Mexicano - note that this is not a literal translation of "Ladder-backed" but instead means Mexican Woodpecker in English.

Wrens

Spanish: troglodita; chochín; sonaja; matraca ("rattle"); saltapared (Some sources limit this term to the Canyon Wren; this is unlikely.)

Matraca is also a vernacular name for Belted Kingfisher in Puerto Rico.

Wrens (Large)

Spanish: matraca

Wrens (Small)

Spanish: saltapared ("wall-jumper")

(Defayes lists this term for several small wrens including Canyon, Wren, Rock Wren, House Wren, and Marsh Wren). It is also used for Bewick's Wren.

Wren, Cactus

Latin binomial: *Campylorhynchus brunneicapillus*

Spanish: saltapared, matraca (Matraca Grande)

Yellowthroat, Common

Spanish: mascarita; mascarita común.

This listing can be improved - with your help. Please send in your additions and corrections.

Follow-Ups/Tidbits

ChatGPT

In the April 2023 issue of this journal we included three articles about the uses, capabilities, and controversies associated with language and image programs which use computer algorithms. One of the major criticisms of ChatGPT, one of those algorithms, is that it generates text which may not be accurate. Enter a program called "assistant" by scite_ which can provide formal citations for any statement, including an assessment of whether the citation supports the statement or not.

Bird Migration Patterns

"Climate-driven flyway changes and memory-based long-distance migration", Gu et al., *Nature*, Vol. 591, 11 March 2021, pp. 259-264. And "A bird's migration decoded", Simeon Lisovski and Miriam Liedvogel, pp. 203-204 in the same publication.

These reports, on the migration patterns of Peregrine Falcons, *Falco peregrinus*, in Eurasia is pertinent to our populations of this falcon, and quite probably other migratory bird populations. From the abstract of the first article: "The breeding populations used five migration routes across Eurasia, which were probably formed by longitudinal and latitudinal shifts in their breeding grounds during the transition from the Last Glacial Maximum to the Holocene epoch . . . . We found that the gene ADCY8 is associated with population-level differences in migratory distance. We investigated the regulatory mechanism of this gene, and found that long-term memory was the most likely selective agent for divergence in ADCY8 among the peregrine populations. Global warming is predicted to influence migration strategies and diminish the breeding ranges of peregrine populations of the Eurasian Arctic."

Phenology

"Leaves Are Springing Up Earlier Along the Appalachian Trail", Kate Hull, *Eos*, 103, 14 December 2022.

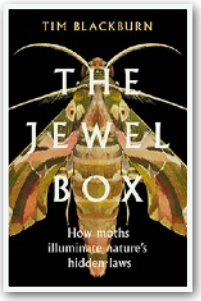
This article notes that along the Appalachian Trail, especially along the northern part, spring is occurring "quite a bit earlier now than it has in past years, scientists have found, documenting a slow, but steady, change that has altered the annual rhythms of many of the trail's ecosystems."

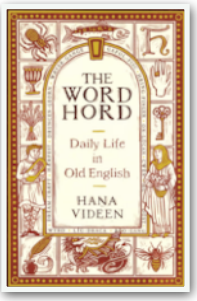
The article reports on a study by Claire Jantz which used Moderate Resolution Imaging Spectroradiometer (MODIS) instruments aboard NASA's Terra and Aqua satellites to evaluate vegetative change. The findings of the study were presented at the December 15, 2022, fall meeting of the American Geophysical Union.

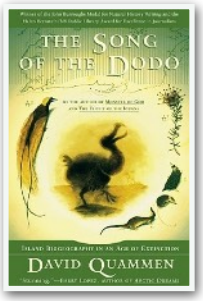
Other recent studies indicate that human induced warming is causing plants to leaf out earlier. And, to stay green longer. Not a shift of growing time to earlier in the year - an increase in growing time.

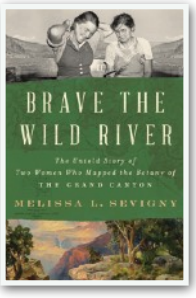
The takeaway for the Black Range? The ability of flora and fauna to change through evolutionary processes may be significant. As other studies show, however, it is not responsive enough to allow them to cope with the speed of human-induced climate change.

What is Being Read and Listened to in the Black Range

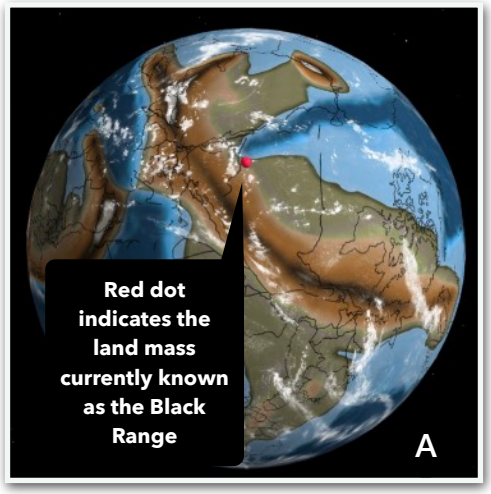




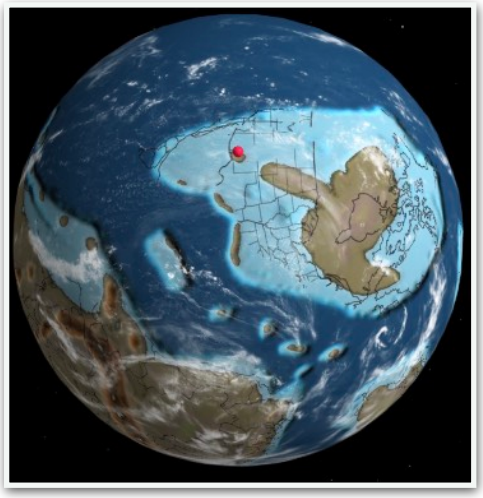




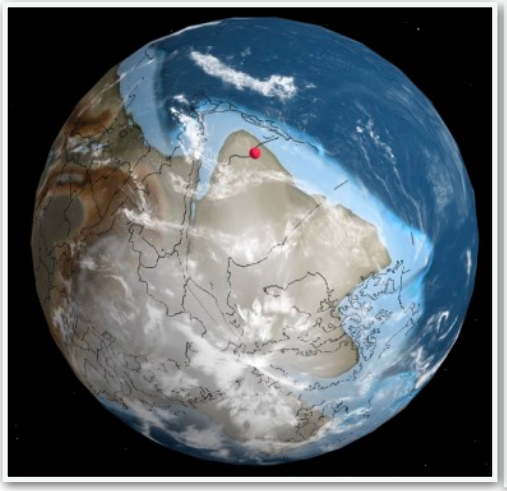
The History of the Black Range



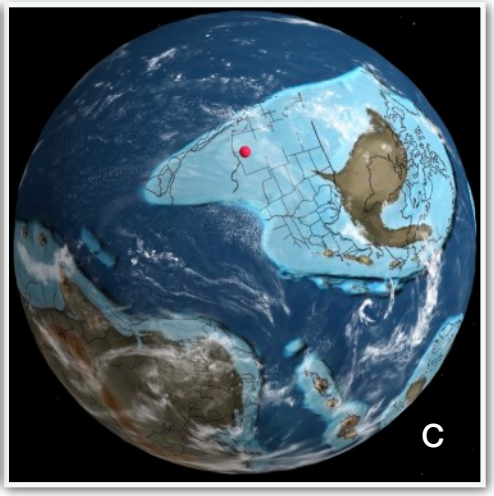
750 MYA, Cryogenian Period, Earth covered in ice, red and green algae first appear.



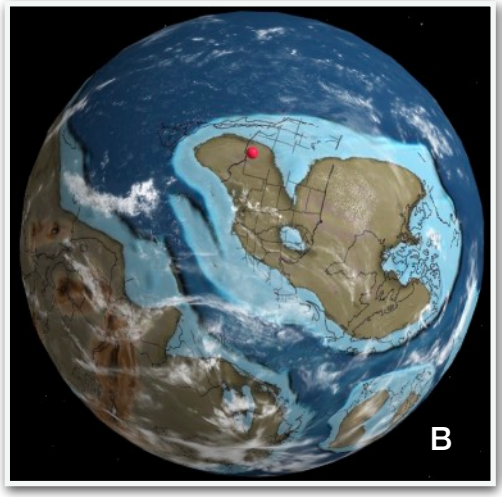
500 MYA, Late Cambrian Period, first vertebrates appear. Black Range on a small island of land.



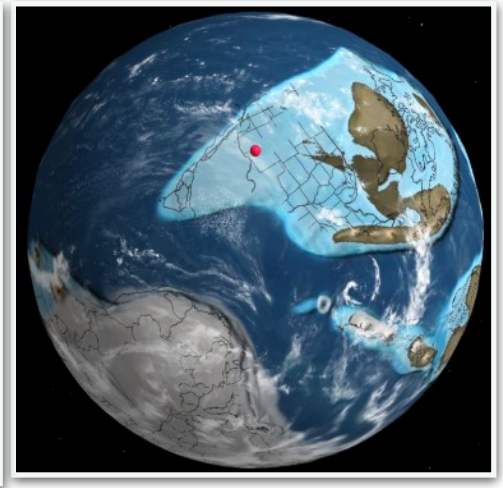
600 MYA, Ediacaran Period. Pannotia supercontinent. Multicellular life beginning to appear.



470 MYA, Ordovician Period. First coral reefs, no complex life on land (unimportant to us because the Black Range is under water).



540 MYA, Early Cambrian Period, mass extinction followed by an increase in life forms, known as the Cambrian explosion.



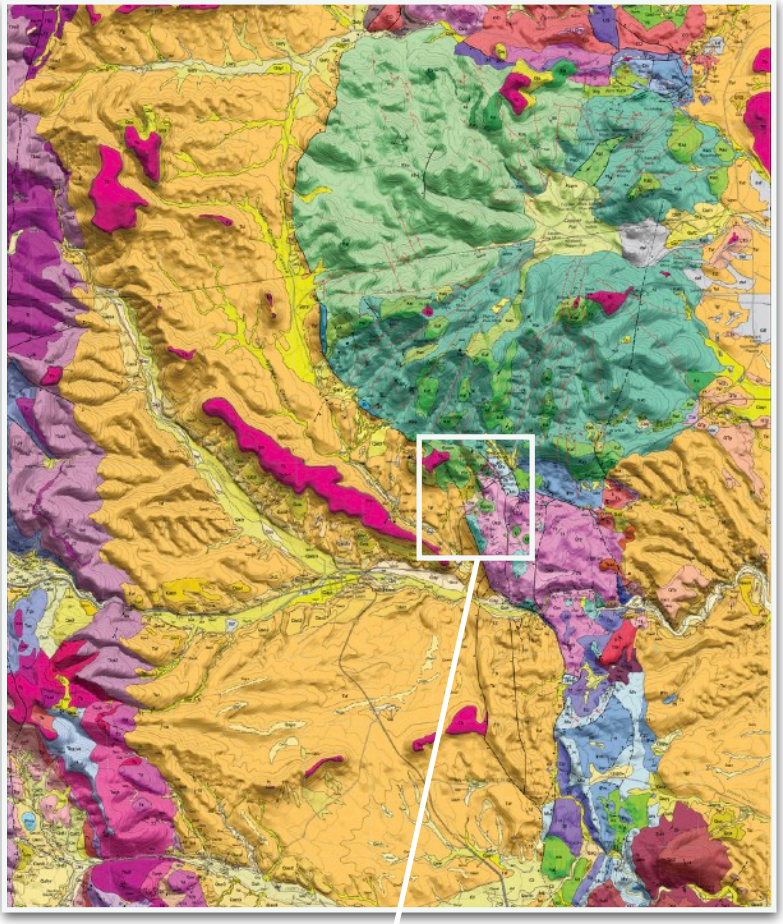
450 MYA, Late Ordovician Period, Black Range still under water.

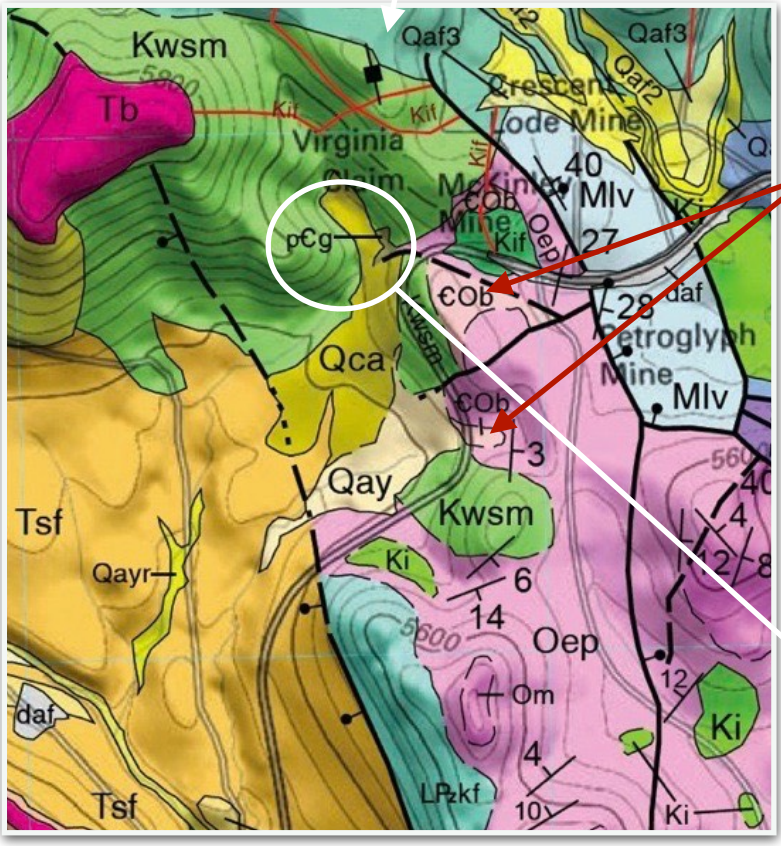
This series of globes was created and is maintained by Ian Webster. See more of his work at ianww.com or email him at ian@dinosaurpictures.org.

The globe depictions shown here and on the following pages are meant as a foundation for that which follows.

The geologic map shown on the next page, and elsewhere in this article, is the Hillsboro Geologic Map (7.5 minute quad-rangle) produced by the New Mexico Bureau of Geology and Mineral Resources. (See Volume 2, Issue 4 [October 2019] for more information about the geologic maps which describe the Black Range.)

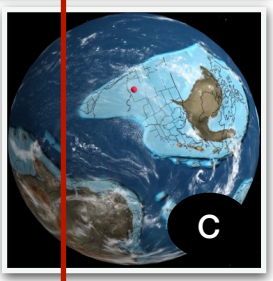
When viewing the road-cut on the following page you can worry about rock falling on your car or you can note that the rock you are looking at is 470 million years old. You might note that it is some type of weird sandstone with a lot of quartz. You might note that it is bounded by faults. The Black Range has some faults; many are in the ground. The dark lines on the geologic map indicate if the rock on either side of the fault was going up or down or moving left or right, if the rock was being shifted from its original position. So much information. Although some of the geologic activity was catastrophic, occurring in a geologic blink of an eye, much occurred over millions of years.





Historical and structural geology, and a good smattering of mineralogy, all collide on the slopes just east of Hillsboro. Historical geology can be thought of as the globes in this series, how the earth has changed over time. Generally it includes paleontology, the study of fossils and other indicators of life. Structural geology, everything from rock layers, lava flows, unconformities, and faults, is a major element on the Hillsboro Geologic Map. All of those bold dark black lines are faults, for instance.

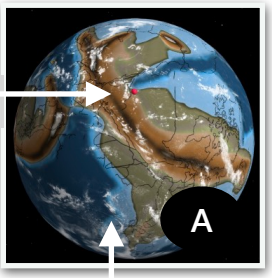




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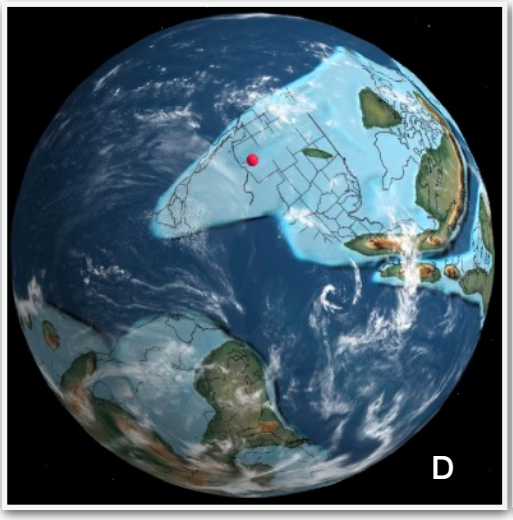
Bliss Formation, upper Cambrian to lower Ordovician. Quartz sandstone, may be a poorly sorted quartzite.

Black Range

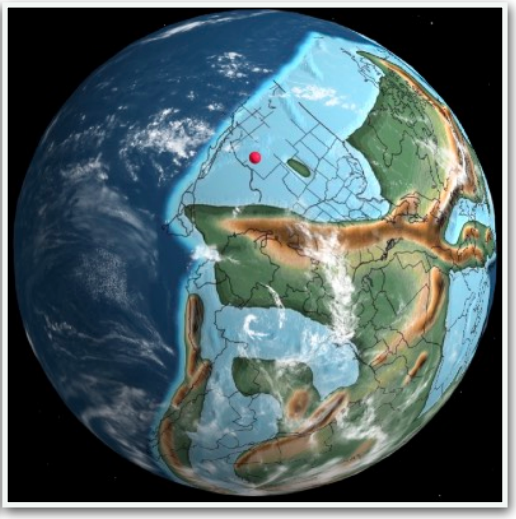


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Precambrian rock in the Black Range is limited. An outcrop near Kingston is dated to about 1.65 BYA, the rock here is younger.



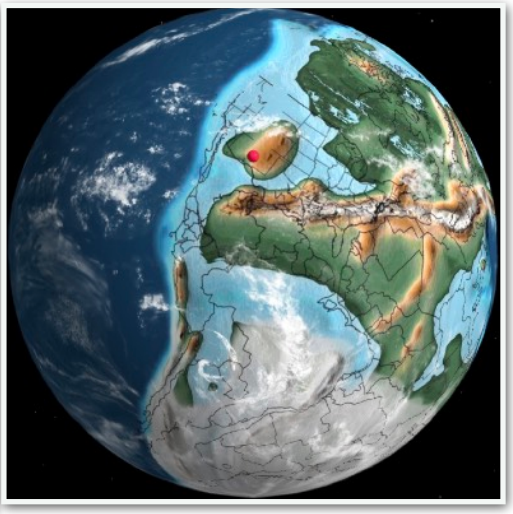
430 MYA, Silurian Period, mass extinction in which half of all marine invertebrate species perished. A big deal for us because the Black Range is still under water. On land, plants start to appear.



340 MYA, Carboniferous Period, Black Range still under water, mass extinction (primarily marine life), plants developing root systems on land, early reptiles.



400 MYA, Devonian Period, Black Range still under water, fish becoming more complex, first vertebrates walk on land.



300 MYA, Late Carboniferous Period, Black Range above the oceans, "forests" and other plants increase oxygen levels.



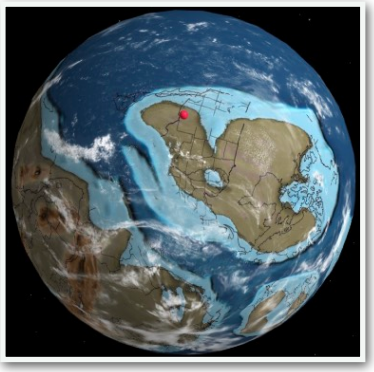
370 MYA, Late Devonian Period, Black Range still under water, diverse sea life including fish and cephalopods.

Compare the map on the following page and the specific map of Lake Valley which follows, in terms of both chronological and geographic detail. "MD" on the following page is described as "Mississippian and Devonian Rocks Undivided. Note that during the Devonian the area shown on the map on the following page was covered in a shallow ocean. The Mississippian Epoch is a major subdivision of the Carboniferous Period.

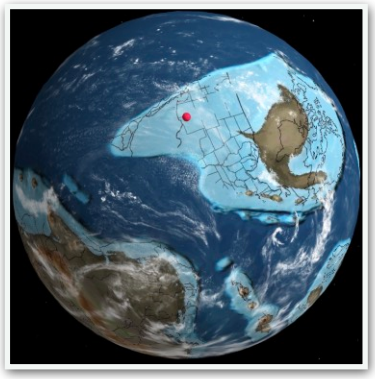
Geologic maps do not all look at the the earth in the same way. Some focus on particular types of features, some are limited to specific cross sections, and of course there is the matter of scale and the effect scale has on the amount of detail which may be shown. The New Mexico Bureau of Geology and Mineral Resources Interactive Map was used as a source for the map on the following page. It has multiple layers for assessing the land forms of the Black Range - or it may be used as a topographic map of the entire range.

The map is a generalization of the geology (a function of scale) of the Black Range.

On this map, "SOC" is described as "Silurian through Cambrian rocks undivided". On the ground it probably means that the rock in this area is a mess. At a higher level, it means that the area shown as "SOC" was created over a period which started 540 MYA and ended more than a hundred million years later. A lot can happen in a hundred million years. Note the globes on the next page. The period starts with the Black Range above water, but for about half the period of formation it was below sea level and covered by a shallow sea. Whether rock was formed below the sea or above the sea can be a significant geologic factor.



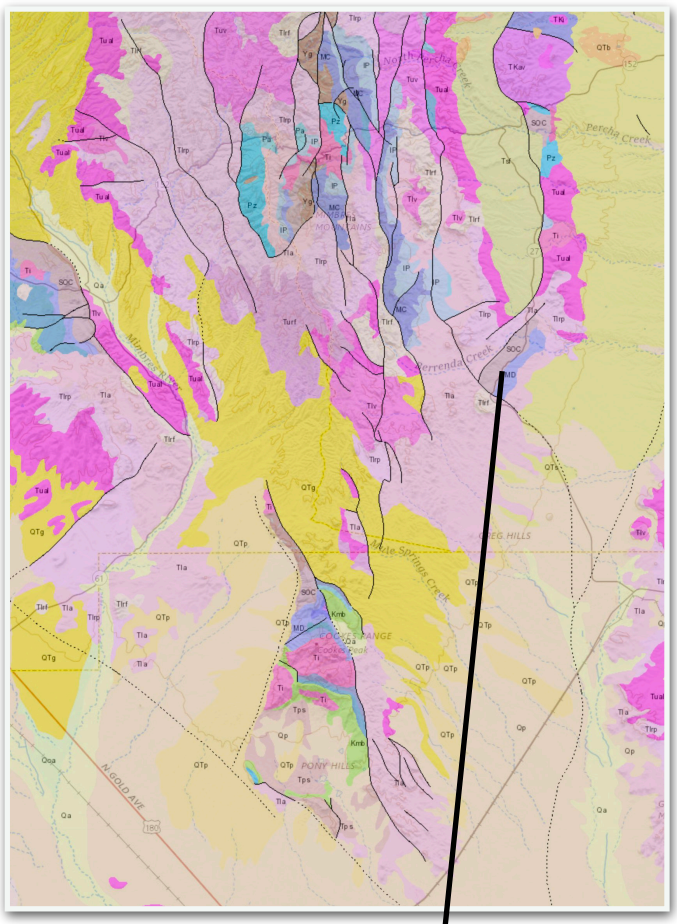
540 MYA, Early Cambrian Period

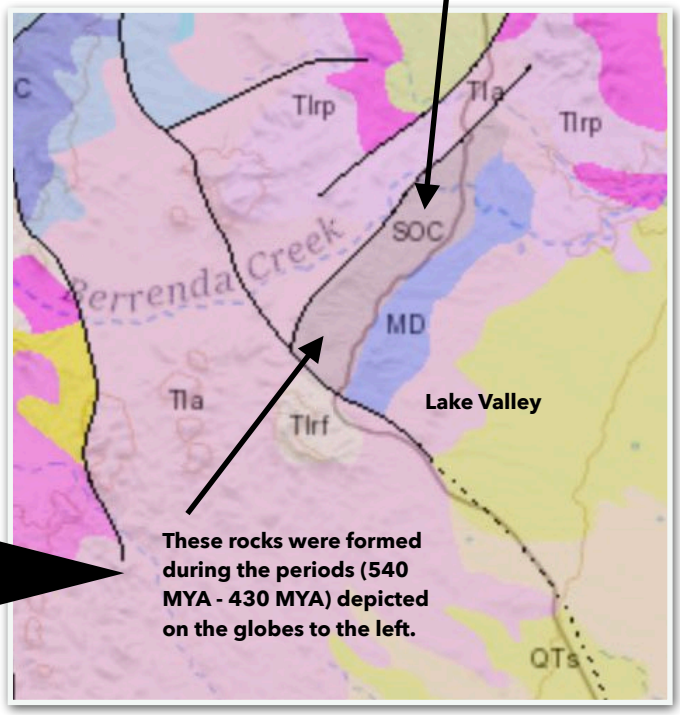


470 MYA, Ordovician Period.



430 MYA, Silurian Period.





These rocks were formed during the periods (540 MYA - 430 MYA) depicted on the globes to the left.



280 MYA, Permian Period, Pangea forms. Ice caps and deserts, diverse sea life, on land plant and the associated animal life was more limited.



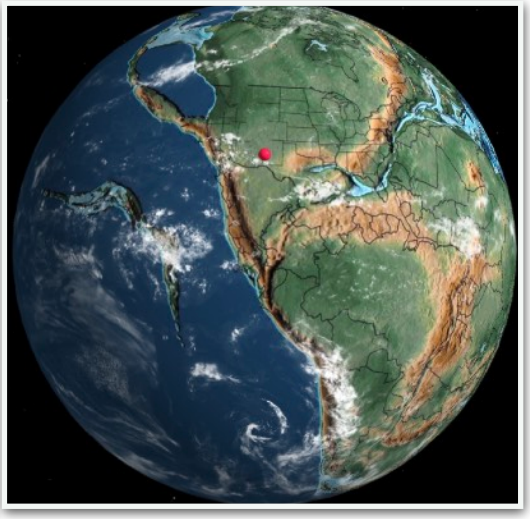
220 MYA, Middle Triassic Period, Black Range firmly above water. Small dinosaurs and first flying vertebrates appear.

One aspect of the geology of the Black Range is shown well on the following page - it is a mess.

The map (which is of a very small area) plots the location of rock which was formed at various times between 480MYA and 40 MYA. Also on the following page, there are photo-graphs of marine fossils from Apache Hill (from around 330 MYA). A few feet away there are volcanic rock formations from the Eocene, formed roughly 40 MYA. This is not a unique occurrence in the Black Range, it is the norm.

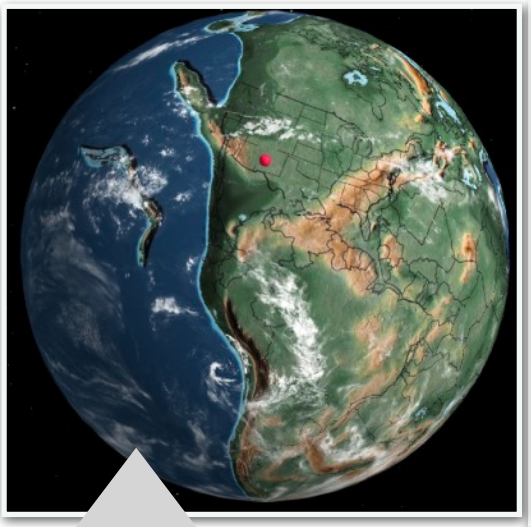


260 MYA, Late Permian Period, Black Range solidly above water.



200 MYA, Late Triassic Period, Black Range firmly above water, first true dinosaurs evolve.

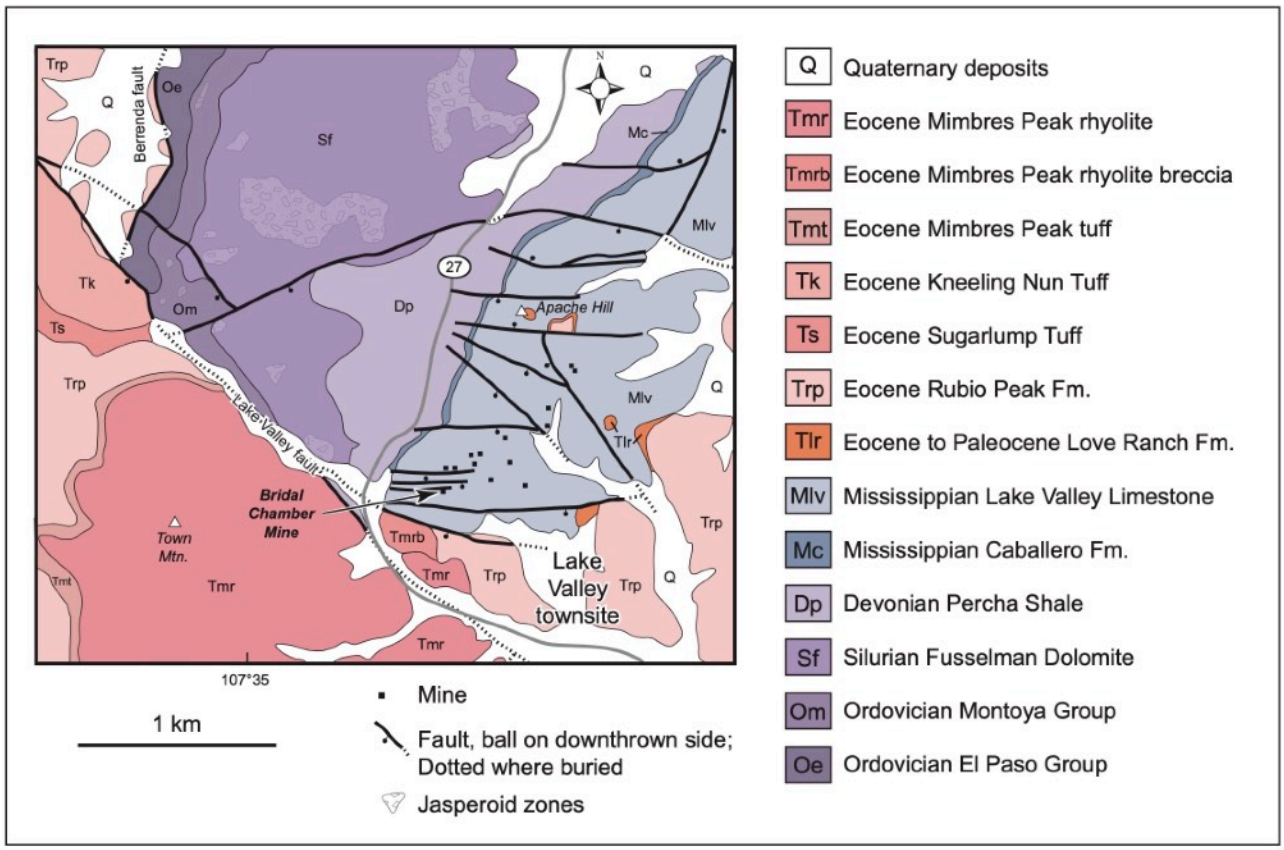
170 MYA, Jurassic Period, Black Range still above water. Extinction of 76% of all terrestrial and marine life species has just happened, and surviving species have greatly reduced populations. Some families (pterosaurs, crocodiles, mammals, and fish) were minimally affected.





The first true dinosaurs emerge and thrive during the Jurassic..

240 MYA, Early Triassic Period, the greatest mass extinction in history took place at the Permian - Triassic Boundary. 90% of all species went extinct. The extinction of plants reduced the oxygen levels in the atmosphere and the food supply for large herbivorous reptiles. Insect habitat vanished. Many corals became extinct. Small ancestors of modern animal lineages survived.

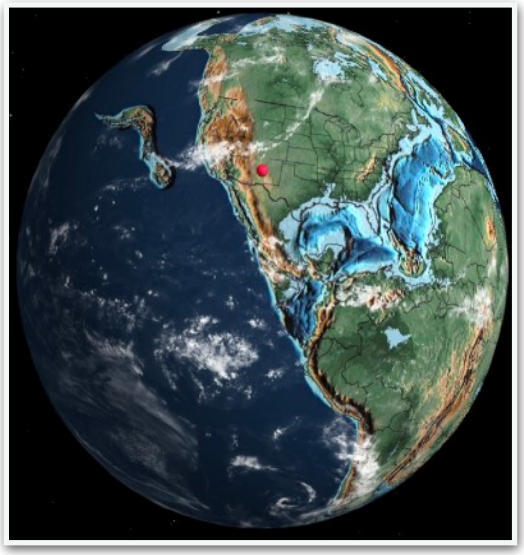




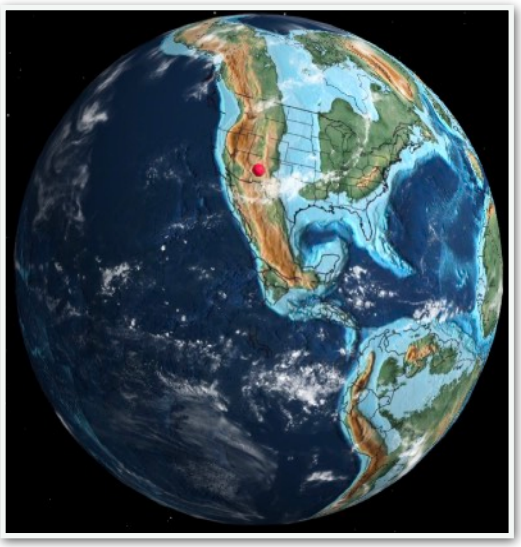


Marine fossils from the Apache Hill site (Mississippian Lake Valley Limestone). See pages 96 - 98, and elsewhere, in *Early Naturalists of The Black Range*, for a summary of the roles of Charles H. Marsh, Edward Drinker Cope, and Frank Springer in exploring and describing this specific area. Yes, part of the great Dinosaur Wars was fought right here.





150 MYA, Late Jurassic Period, Black Range still above water, "North America" taking shape. Big dinosaurs and marine reptiles.



90 MYA, Cretaceous Period, Black Range still above water, sea beginning encroachment.



120 MYA, Early Cretaceous Period, Black Range still above water, large reptiles, small mammals, flowering plants evolve.



66 MYA, Late Cretaceous Period, Black Range still above water. Mass extinction, demise of the dinosaurs.



105 MYA, Cretaceous Period, Black Range still above water. Dinosaurs evolving, mammal, bird, and insect lineages evolving.

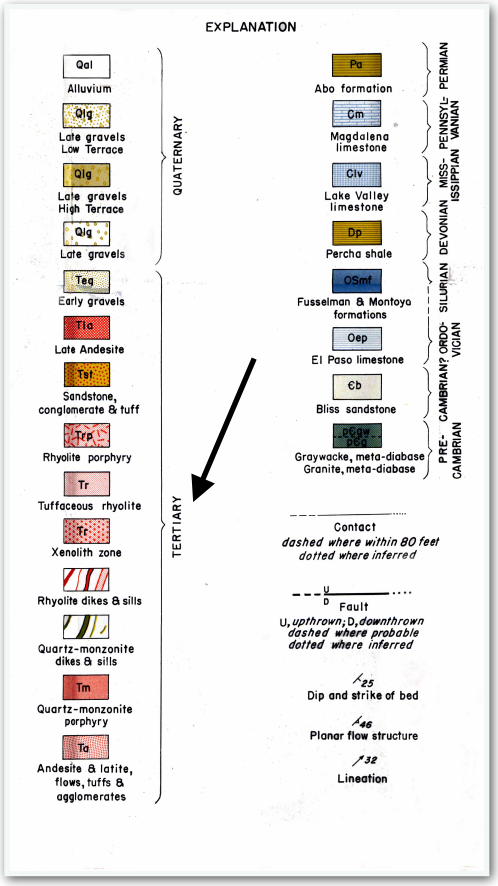
Most of the rock types shown on the map on the following page developed during periods when the area was well above sea level.

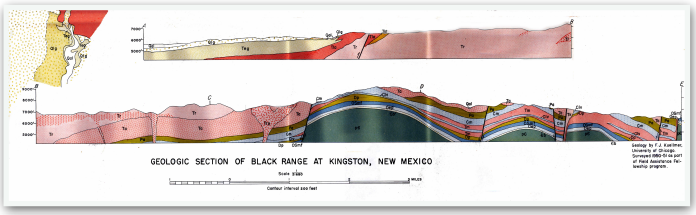
The geologic map of the Kingston, New Mexico, area on the following page provides us with a significant amount of detail and identifies an ongoing issue in the scientific world. Terms keep on changing.

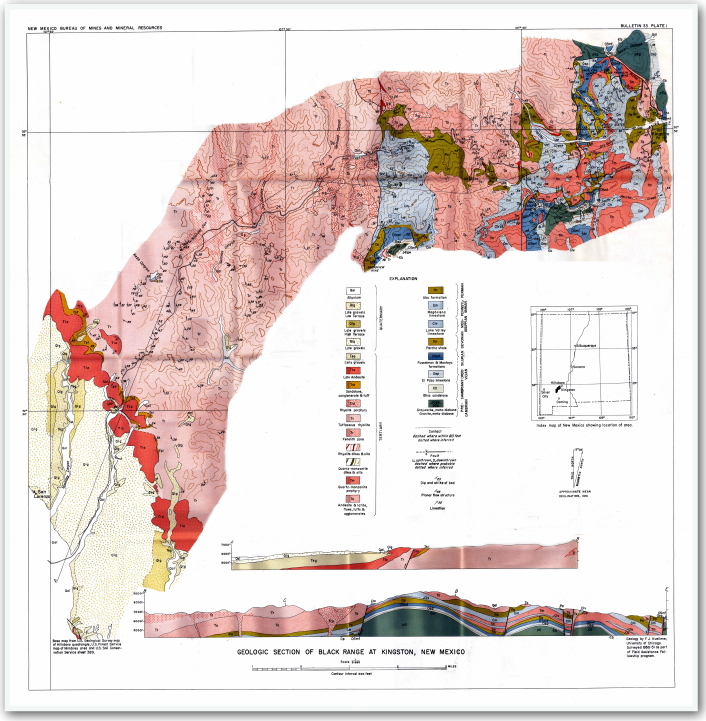
The short arrow (added) on the the following page highlights the "Tertiary" period (a term which is also used on some of the globes which follow). However, the International Commission on Stratigraphy no longer recognizes this classification. Tertiary described what is now known as the Paleogene and Neogene periods.

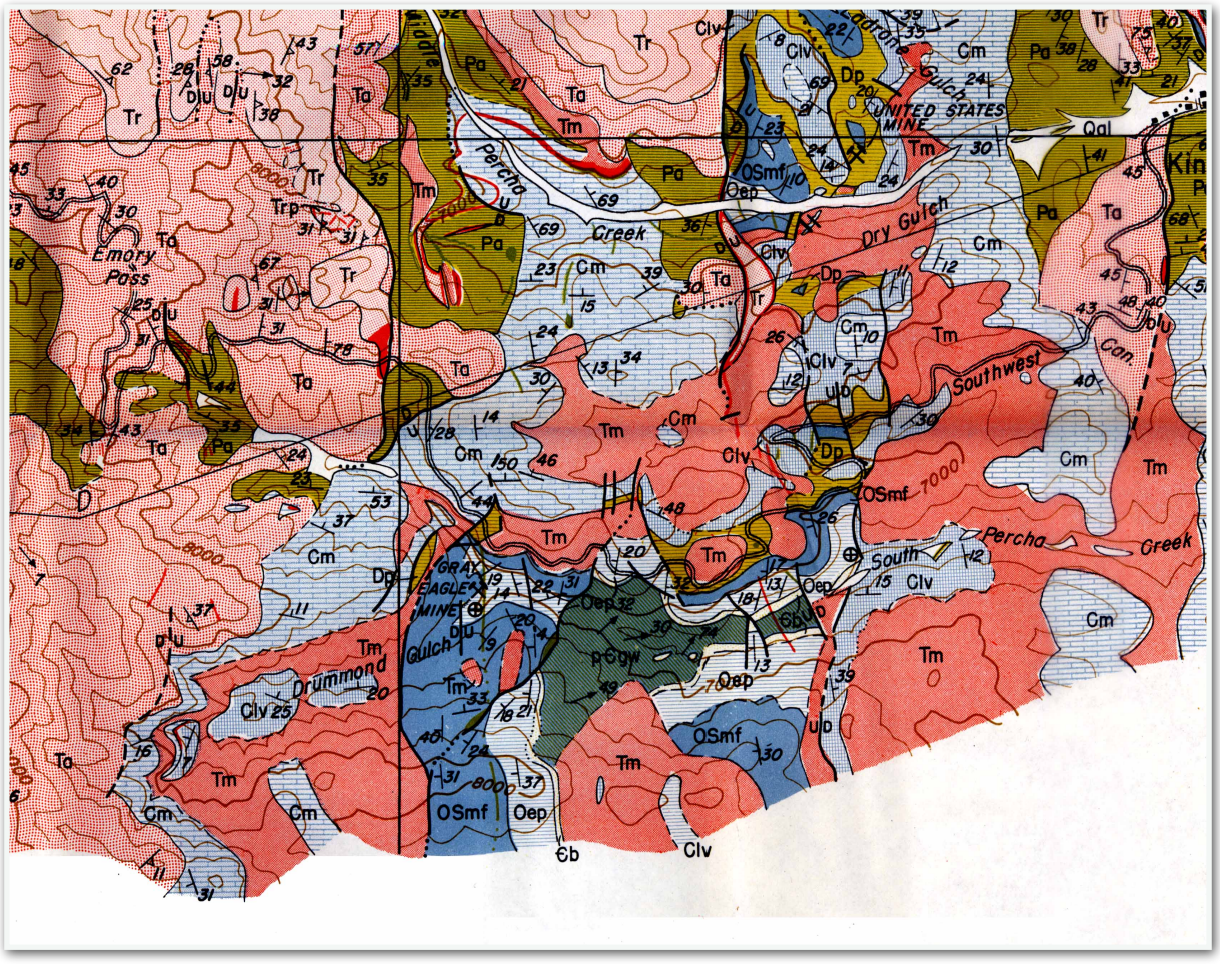
The map on the following page highlights types of rock (mineralogy) and describes various structural (physical geology) features. For the history buffs amongst us, the locations of some of the major historical mines are also identified.

Many geologic maps will include cross sections of the geology in the area. A line (generally straight but sometimes composed of segments which are not in a straight line) is drawn across the geologic map and what is known about the geology underground is shown. A cross-section is shown at the upper right of the following page. The concept of a cross-section gets at the heart of structural geology: how do you know (and depict) that which you can not see? Mapping tools (the utilization of sound waves to identify major rock layers, for instance) have become much more sophisticated in the last few years.


EXPLANATION
Qal
Alluvium
Qlg
Late gravels Low Terrace
Qlg
Late gravels High Terrace
Qlg
Late gravels
Teg
Early gravels
Tla
Late Andesite
Tst
Sandstone, conglomerate & tuff
Trp
Rhyolite porphyry
Tr
Tuffaceous rhyolite
Tx
Xenolith zone
Rhyolite dikes & sills
Quartz-monzonite dikes & sills
Tm
Quartz-monzonite porphyry
Ta
Andesite & latite, flows, tuffs & agglomerates
QUATERNARY
TERTIARY
Pa
Abo formation
Cm
Magdalena limestone
Clv
Lake Valley limestone
Dp
Percha shale
OSmf
Fusselman & Montoya formations
Oep
El Paso limestone
Cb
Bliss sandstone
pCgw
pCg
Graywacke, meta-diabase
Granite, meta-diabase
PERMIAN
PENNSYL-VANIAN
MISS-ISSIPPIAN
DEVONIAN
SILURIAN
ORDO-VICIAN
CAMBRIAN?
PRE-CAMBRIAN
Contact
dashed where within 80 feet
dotted where inferred
U
D
Fault
U, upthrown; D, downthrown
dashed where probable
dotted where inferred
25
Dip and strike of bed
46
Planar flow structure
32
Lineation


GEOLOGIC SECTION OF BLACK RANGE AT KINGSTON, NEW MEXICO


GEOLOGIC SECTION OF BLACK RANGE AT KINGSTON, NEW MEXICO


Emory Pass
Percha Creek
Dry Gulch
Southwest
Percha Creek
South
Drummond
Gulch
UNITED STATES MINE
GRAY EAGLE MINE
Tr
Ta
Tm
Pa
Cm
Clv
Dp
OSmf
Oep
Cb
pCgw
Qal
Trp
Tla
Tst
Teg
Qlg
Kin



50 MYA, Early Tertiary Period, Black Range still above water. Surviving species diversify.



35 MYA, Mid Tertiary Period, Black Range still above water. Primates and other forms evolve, deciduous plants increase.



20 MYA, Neogene Period. Human primate ancestors begin to migrate out of Africa.

Although this is not an exhaustive listing, the following resources contain a substantial amount of information about the geology of the Black Range.

- ☑ A Photo Gallery of The Rocks and Minerals of the Black Range - limited to specimens collected in the Black Range.
- ☑ Mineral Listing - a listing of minerals and the mines where they were found in the Black Range.
- ☑ The Geology of the Hillsboro Quadrangle
- ☑ Giant of the Mimbres - A page about the discovery and geologic history of the formations along NM-61; also as an article in Vol. 2, No. 4 of the Black Range Naturalist.
- ☑ Sedimentary petrography and depositional environments of the the type section of the Mississippian Lake Valley Formation, Sierra County, New Mexico - January 2012 by Karl Krainer and Spencer Lucas (8.1 MB)
- ☑ The Pennsylvania Red House Formation, Central Sierra County, New Mexico by Lucas, Krainer, Barrick, and Spielmann, 2012 (10.4 MB)
- ☑ Systematics, Phylogenetics, and Biogeographyof Early Mississippian Camerate Crinoids of the Nunn Member, Lake Valley Formation, in South Central New Mexico by Elizabeth C. Rhenberg (3.1 MB)
- ☑ The Lower Permian Abo Formation in the Fra Cristobal and Caballo Mountains, Sierra County, New Mexico by Lucas, Krainer, Chaney et al. 2012 (2.2 MB)
- ☑ The Sub-Cretaceous Unconformity in New Mexico by Steven Cather 2012 (2.1 MB)
- ☑ Upper Cretaceous Stratigraphy and Biostratigraphy of South-Central New Mexico by Hook, Mack, and Cobban 2012 (3 MB)
- ☑ Mineral and Energy Resources of the Mimbres Resource Area in Southwestern New Mexico - 1997 - U. S. Geological Survey (2.5 MB)
- ☑ Mineral-Resource Assessment of Luna County, New Mexico - 2001 - McLemore et al.
- ☑ Geochemistry of the Copper Flat Prophyry and Associated Deposits in the Hillsboro Mining District, Sierra County, New Mexico, USA by McLemore, Muroe, Heizler, and McKee 1999 (.7 MB)
- ☑ Cretaceous Dinosaurs in New Mexico by Lucas, Heckert and Sullivan 2012 (.7 MB)
- ☑ Geomorphic Development of the Giants of the Mimbres, Grant County, New Mexico, by Mueller and Twidale, 2002
- ☑ Landform Development of City of Rocks State Park and Giant of the Mimbres, by Mueller and Twidale, 1988
- ☑ Geologic Investigations in the Lake Valley Area, Sierra County, New Mexico, J. M. O'Neill Editor, US Geological Survey Professional Paper 1644 (9.9 MB)
- ☑ Fluorspar Deposits of Burro Mountains and Vicinity New Mexico, by Elliot Gillerman, Geological Survey Bulletin 973-F, 1951 (2.5 MB)
- ☑ Some Aspects of the Kneeling Nun Rhyolite Tuff, by David L. Giles, 1965
- ☑ Bulletin 37 - Geology and Mineral Deposits of Lake Valley Quadrangle, Grant, Luna, and Sierra Counties, New Mexico, by Henry L. Jichia, Jr. 1954 (3.5 MB)
- ☑ Studies Related to Wilderness Primitive Areas: Black Range New Mexico - Geological Survey Bulletin 1319-E, by Ericksen, Wedow, Eaton, and Leland, 1970 (11.3 MB)
- ☑ The Geology and Ore Deposits of Sierra County, New Mexico (.pdf version) and online book version.
- ☑ Geologic Map of the Hillsboro 7.5 Minute Quadrangle (a full-sized .pdf which is 12.4 MB in size)
- ☑ Report which accompanies the Geologic Map of the Hillsboro Quadrangle (this file is 2.4 MB in size)
- ☑ .kmz of Hillsboro Geology Map on Google Earth (Very Large 98.7 MB in size)
- ☑ Lake Valley Geologic Map

- Geologic Map of the Skute Stone Arroyo 7.5-Minute Quadrangle (21.1 MP in size)
- Geologic Map of the Winston 7.5-Minute Quadrangle (19.4 MP in size)
- Geologic Map of the Iron Mountain 7.5-Minute Quadrangle (20 MP in size)
- Geologic Map of the Massacre Peak 7.5-Minute Quadrangle (15.3 MP in size)
- Geologic Section of the Black Range at Kingston, New Mexico by Frederick J. Kuellmer.
- The Taylor Creek Tin Deposits, New Mexico by J. M. Hill
- USGS Bulletin 945-C, Beryllium and Tungsten Deposits of the Iron Mountain District, Sierra and Socorro Counties, New Mexico, by Richard H. Jahns
- Geologic Maps of the Black Range - Volume 2, Number 4, Black Range Naturalist
- Hematite and Specularite - Volume 2, Number 4, Black Range Naturalist
- Rhyolite and Tuff - Volume 2, Number 4, Black Range Naturalist
- Arctos Information System - Volume 3, Number 3, Black Range Naturalist

Datana neomexicana

A year or so ago Véronique De Jaegher (Kingston) took photographs of several species of caterpillars, while on a walk near Kingston. The following day Rebecca Hallgarth and Bob Barnes hiked up the trail from the Kingston cemetery toward Emory Pass and found what may have been the same population. One of the caterpillars, black with white hairs, was difficult to identify. The story of that saga was printed this year in the April issue of the Black Range Naturalist.

The search to ferret out the identification of that caterpillar species eventually involved experts from throughout the U.S. The entomological research center at Iowa State University, which among other things runs BugGuide, are now in agreement that the caterpillar in question is *Datana neomexicana*. Normally, getting something published on one of these sites (BugGuide, iNaturalist, BAMONA, or others) is not that big a deal. These images, however, are the only images of *Datana neomexicana* currently posted to the BugGuide site. From there they will populate other natural history sites.

Science is built one molecule at a time. Every bit we contribute builds to a totality.

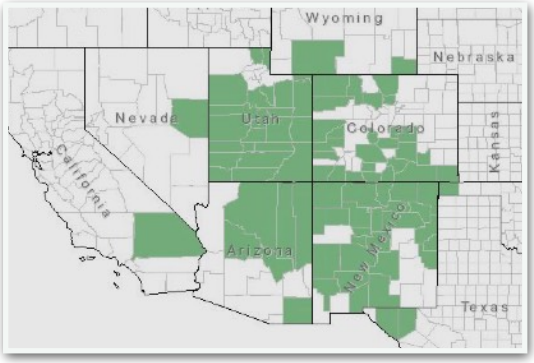




This photograph of wood haulers, taken between Hillsboro and Kingston, is a perennial favorite in the Black Range - and has appeared in the Black Range Naturalist. Its attribution is now known as, E. S. Shipp, 1928, U. S. Forest Service. The image is notable for several reasons, not the least of which are those clouds. Woodcutters would often taken several burros with them to the wood cutting site, load them up, and let them make there way back to the corral on their own. During the era of this photograph you might be out and about and see a burro, fully laden with firewood, mosey on by.

Two-needle Pinyon
Pinus edulis (Englemann)

The Two-needle Pinyon is the common pinyon (piñon in Spanish) of the Black Range. It is found in the southwestern quadrant of the United States, as shown by the range map below, from the Fire Effects Information System (FEIS) of USDA. The species extends well into Mexico.



Photographs on this and the following pages were taken in May 2023 (unless otherwise indicated) along NM-152 west of Kingston, NM.

In Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and the Bureau of Land Management (April 2023), the US Department of Agriculture, Forest Service, and the US Department of Interior, Bureau of Land Management, reported that they had 9,123,484 acres of pinyon/juniper old growth in their inventory. This forest type constitutes about 35% of their total old growth inventory. It should be noted that despite decades of controversy about old

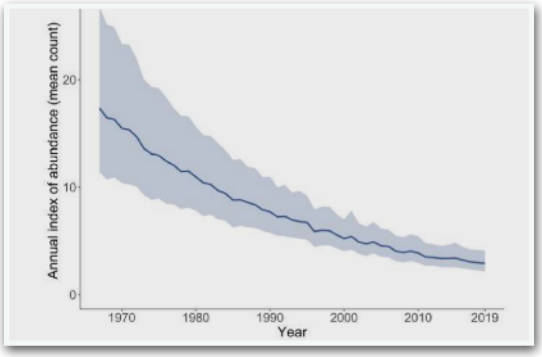






growth forests, there is no universally accepted definition of this forest type. The politicization of the concept of "old growth" has not been helpful in this endeavor. Pinyon pine has been treated as a junk tree by the federal and state land agencies. At the same time the above report was being issued, the Defenders of Wildlife and the Southern Utah Wilderness Alliance announced a court-approved settlement which required "the Bureau of Land Management (BLM) to abandon a decision authorizing extensive destruction of native pinyon pine and juniper habitats across the American West without requiring prior analysis and public disclosure of possible environmental impacts." At various times, BLM advanced differing explanations of why there should be a Categorical Exclusion from the provisions of the National Environmental Policy Act (NEPA), which would allow the destruction of this forest type without review. In the end, the court was persuaded that actions taken within the forests of the federal inventory had to have a more thorough ecological assessment of those actions. One argument advanced against the Categorical Exclusion was the drastic reduction in the Pinyon Jay population. Pinyon Jays are dependent on pinyon pine. The graph below is based on Breeding Bird Survey information and is taken from the proposal to list the Pinyon Jay as an endangered species.





***Pinus edulis* Engelm. var. *edulis* is known by many common names including Twoneedle Pinyon, Two-needle Pinyon, Two-leaved Piñon, Common Piñon, Piñon, New Mexican Pinyon, etc. The focus on "two" is important, however, because *Pinus edulis* generally has two needles per bundle (two per fascicle) and this is diagnostic for identification of the species. (Apparently there is a small population in Arizona which has only one needle - *P. edulis* var. *fallax* Little,1958.)**

Latin binomial synonyms for *P. e. var. edulis* include *Pinus monophylla* var. *edulis* (Engelm.) M. E. Jones 1891; *Caryopitys edulis* (Engelmann) Small 1903; *Pinus cembroides* var. *edulis* (Engelm.) Voss 1908; and *Pinus cembroides* subsp. *edulis* (Engelm.) A. E. Murray 1982.

***Pinus cembroides*, the Mexican Pinyon, was the first of the pinyons to be described, in 1830. *Pinus monophylla* (Singleleaf Pinyon) was described in 1845 and *Pinus edulis* in 1848.**

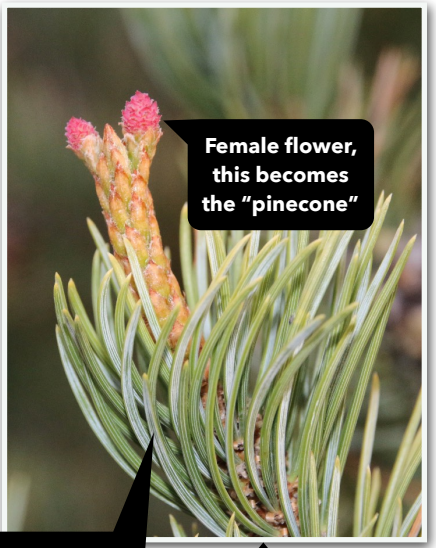
Vascular Plants of the Gila Wilderness indicates that *Pinus cembroides* var. *bicolor* is found only in the area of Mule Creek (close to the Arizona border) in the Gila National Forest. It hybridizes freely with *Pinus edulis* in areas where they both grow.

***Pinus edulis var. fallax* (Arizona Single Leaf Pinyon) is found in the Burro Mountains south of Silver City.**

The classic pinyon-juniper woodlands which you hear so much about consist of four taxa of pinyons and six taxa of juniper. The mix of species varies throughout the west, but some type of pinyon species is generally found with some type of juniper species. Pinyon-juniper is a forest type rather than a descriptor of two species. The Gymnosperm Database notes that *"Regardless of its dominant tree species composition, the pinyon-juniper woodland is of enormous ecological importance because the dominant trees create a structure that produces habitat diversity, attenuates soil*







erosion and microclimatic extremes, retains snow cover and enhances soil moisture, supports very high diversity of both cryptogamic and vascular vegetation, and provides an important food source (pine nuts and juniper "berries") for many species of birds, mammals, and insects. These resources are in turn available to humans, who historically have exploited them primarily for grazing domestic animals, and in this connection the piñon-juniper woodland is of great economic importance."



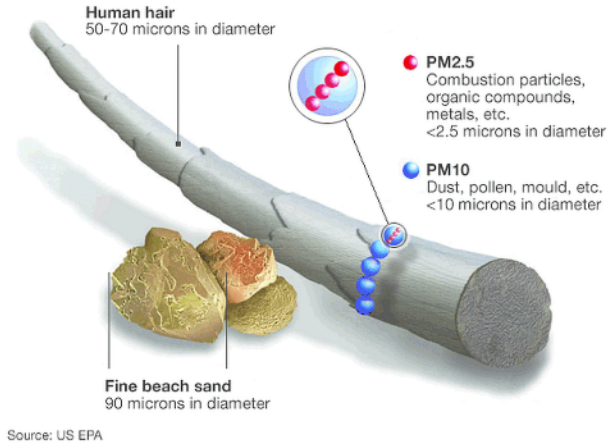
The Two-needle Pinyon is monoecious and the species is wind-pollinated. It is possible to find several stages of seed growth on one stem. Seed cones take two years to mature. The seed cones shown at the top of page 75 are close to maturity. Soon they will spring open and the seeds will drop to the ground. Although open seed cones will generally drop to the ground after the seeds have dispersed (see photo at the bottom of the following page), it is not uncommon to find open cones remaining on the tree for quite some time. Two immature cones are shown on this page. The seeds of this species, and of pinyons generally, are nestled deep inside the cone, and an upper cone scale holds the seed within the cone. Because of that, the seeds do not easily disperse on their own. This characteristic makes it easy for humans and birds to gather the seeds. As pine cones go, Two-needle Pinyon cones are small, generally ranging from 3 - 5 cm in diameter. Two-needle Pinyons mast, that is, there are some years when they produce very large cone crops while they produce hardly any in other years. There are a number of factors which contribute to masting, including the growth cycle of cones. Many species mast, many individuals producing large numbers of seed in a synchronized manner. The controlling processes are not understood.

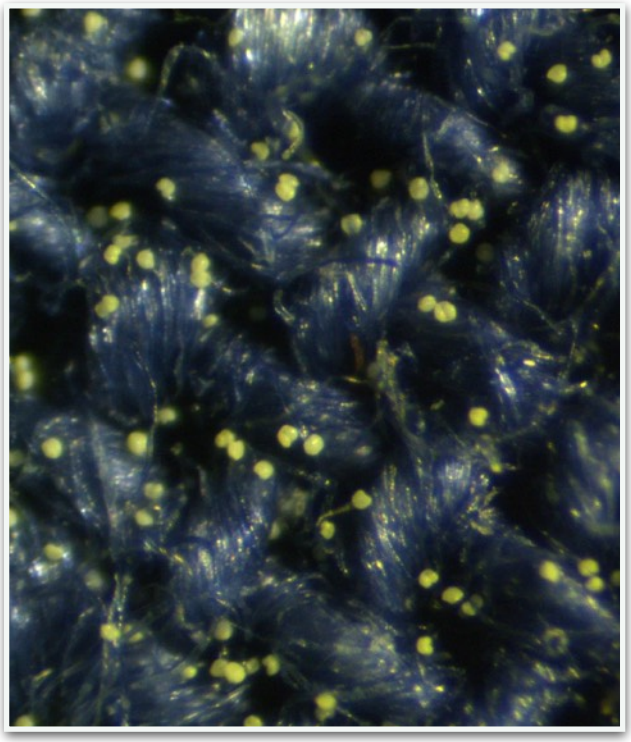






The pollen of this species floats freely in the air. Since most female cones are located below the male pollen cones, pollen is dispersed easily, even when there is no wind. As noted on the Vascular Plants of the Gila Wilderness website, an individual pollen grain is roughly 40 µm (a µm is a micrometer, which is one millionth of a meter, often referred to as a micron). In Two-needle Pinyon the pollen grains are saccate. Saccate pollen means that the pollen has air bladders or "wings" which help them float in the air. When this species is releasing pollen and the wind is blowing, the air seems to be full of a fine yellow dust.

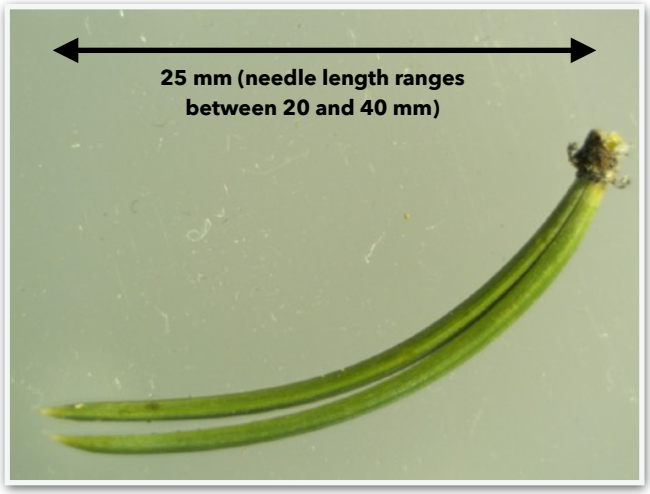




The Two-needle Pinyon pollen grains shown above were captured with a very tightly woven handkerchief. The individual threads of the cloth appear very large compared to the pollen grains. The twin bladder sacs of some of the pollen grains are visible in this photograph.

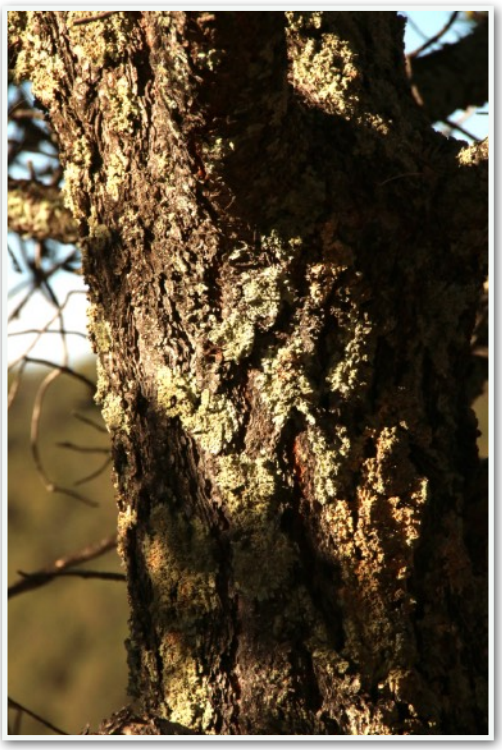
The leaves (needles) of this plant will last from 4-6 years. As shown on the previous page, there are generally two needles per fascicle in this species, from which it takes its name. Do not, however, become upset if you find fascicles with one or three needles on the same twig. The key to identification is preponderance.

The stomata are arranged in rows which run the length of the individual needles (see photo middle left). Stomata are the mechanisms which govern gas exchange in plants. As stomata are open, albeit controlled, points of access between the plant and the environment, there is the possibility that the plant will lose some of its resources (like water) to the outside world. In arid climates the function of stomata can be very tightly controlled with "guard cells" between the stomatal openings and the outside world and (often) thick layers of material cover the plant surface. A quick feel of any pine needle provides an impression of the rigidity that this configuration can create.



A Two-needle Pinyon fascicle with two needles. Black Range. May 2023.





Trunk/Bark of Two-needle Pinyon.



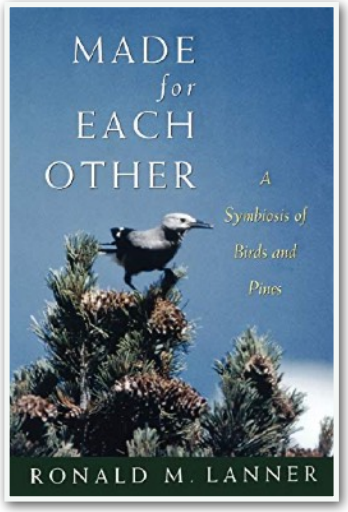
As the Season Progressed at the Same Location





Two-needle Pinyon is a small tree, up to about 45' in height and 2' in diameter.

Two-needle is generally found at elevations between 4,600' and 9,200', depending on variables like latitude and water availability. In the Black Range, it is typically found at lower elevations than 9,200'. Some sources indicate this species grows between 4,500' and 6,500', others (Southwest Field Guide) say 5-7,000'. The photographs taken for this article were of trees growing at 6,500'.



The mutualistic relationship between pinyons and several bird species is described in *Made for each other: a symbiosis of birds and pines,* by Ronald M. Lanner, 1996. The seeds of this species (and other pinyons) are large and cannot be distributed by the wind. Mexican Jays, Pinyon Jays, Clark's Nutcrackers, and Steller's Jays disperse the seeds. These species gather and cache large numbers of pinyon seeds for their winter food supply. Not all seeds are recovered by the birds, thus seed dispersal. Although Mexican and Steller's Jays gather seeds only from open cones, the other two species may start with cones which have not matured. Pinyon Jays have an expandable esophagus and can carry many seeds at one time (an average of 56, in one study).

The dispersal success associated with these four species is not uniform. Clark's Nutcrackers and Steller's Jays cache the seeds they gather at higher elevations (Ponderosa Pine and mixed conifer forests) where seed germination is not often successful. Mexican and Pinyon Jays will cache their seeds in woodlands similar to where they gathered the seeds. Mexican Jay dispersal is relatively local; Pinyon Jays may fly up to twelve kilometers to cache seeds. Pinyon Jays will cache most of their horde as individual seeds, rather than in large groups.

Humans also gather pinyon seeds and they are a high-priced food item - at the time of this writing in excess of $30 USD per pound. Several countries have established very large plantations to grow pinyons (and harvest their seeds). Many commercially grown pine nuts found in our supermarkets are from China, for example.

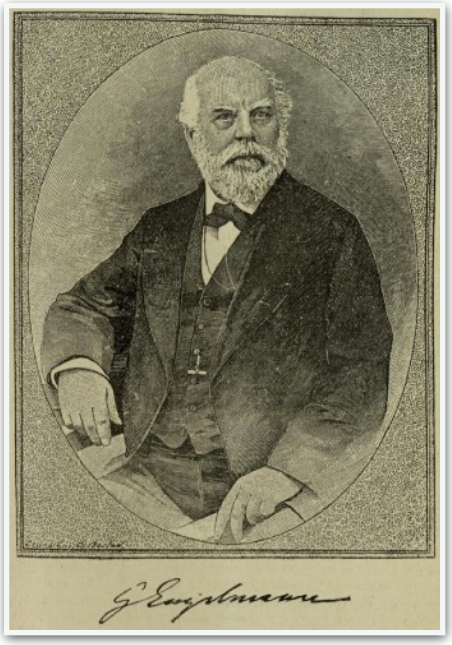
This species has been consistently attacked by the mining and livestock industries, either directly or through their political and agency surrogates (see earlier reference to the BLM's attempt to eradicate the species in parts of Utah). "*Examples include very widespread deforestation due to mining activities in Nevada (Young and Budy 1987, Lanner and Frazier 2011), extensive programs of woodland "control" to enhance profits in the livestock industry (Gottfried and Severson 1994), and a drought in the early 2000s (with accompanying pest and disease-caused mortality) that affected 1.2 million hectares of P. edulis-dominated P-J woodlands and killed up to 350 million piñons in the Four Corners region (Shaw et al. 2005, Hicke and Zeppel 2013, Meddens et al. 2015).* (cite link)"

Assuming that a tree is able to avoid ranchers and fire it may live for a long time. The oldest Pinyons are thought to be over a thousand years old (sample SUNB2522 was dated at 973 years of age in 1956), many of the old growth trees are in excess of 700 years of age, and the average age of mature trees is assumed to be in the range of 350 years.

George Englemann (1809-1884)

George Englemann was the initial describer of *Pinus edulis* in 1848. Englemann was one of the most influential and prolific naturalists of his time and is especially well known for his work with conifers. He was the original describer of 27 conifer species. Two conifers are named for him. His extensive works were not limited to the conifers. Look through any western plant book and you will find Englemann (this or that), named in his honor.

In 1832 he emigrated to the United States from Germany and by 1835 had settled in to a medical practice in St. Louis, where he lived until his death. His obituary in the *Bulletin of the Torrey Botanical Club*, Vol. 10-11 (1884) p. 38, is comprehensive. This image is from that article.



Reference Material Not Cited

***Phytologia*, Vol. 17, No. 4, 1968, "Two New Pinyon Varieties From Arizona", Elbert L. Little Jr., pp. 331-336.**

North Carolina Extension Gardener Plant Toolbox (webpage)

Southwest Colorado Wildflowers (webpage)



The Natural History of the Gila Symposium's mission is to provide a venue for researchers, land managers, conservationists, and educators to meet and share information and ideas gathered from the Gila Region including watersheds and neighboring areas extending into southwestern New Mexico, southeastern Arizona and Mexico.

Centennial Celebration of America's First Wilderness – the Gila Wilderness

by Jim McGrath

A centennial celebration will take place during 2024 as June 3, 2024 will be the 100th anniversary of the establishment of the Gila Wilderness. The Gila Wilderness was the first U. S. Government wilderness area. The great American naturalist, forester and ecologist Aldo Leopold was the primary advocate for the establishment of this wilderness.

There will be many events celebrating the Gila Wilderness centennial during 2024. First, the 10th Natural History of the Gila Symposium will take place Feb. 29 - March 1, 2024 in Silver City. Presentations will be both in person and virtual. The Gila Natural History symposium has taken place every other year since 2006.

The Aldo Leopold Foundation based in Baraboo, WI celebrates Leopold Week March 1-10, 2024. Steve Morgan, a local wilderness enthusiast based in Kingston, and the Aldo Leopold Foundation are planning celebratory events in NM during Leopold Week. These events will emphasize art and writing, even a play, and will involve local NM schools.

Seven articles pertaining to the Gila Wilderness Celebration will appear in Desert Exposure from June 2023 through September 2024.

Several celebratory events will more or less take place around the actual anniversary date of June 3, but the formal celebration of the 100th anniversary of the establishment of the Gila Wilderness will take place on Saturday, June 1. Booths will be set up in and several activities will take place in Gough Park in Silver City.

The U.S. Forest Service has been taking the lead organizing centennial events with monthly Gila Wilderness Centennial Collaborative meetings. Although still in the development stage, events currently planned include a speaker and storytelling series, a film festival, a symphony, an art show print competition, youth mural projects, a Silver City Museum exhibit, dark skies events, botany and bird hikes, a driving and/or bike loop tour, wilderness trainings, development of a centennial trail, a primitive skills exhibition, and an Aldo Leopold fishing event. There is even a working group addressing under-represented communities in wilderness.

The 2024 4th of July parade in Silver City will have a wilderness theme and celebrate the centennial.

The series of celebratory events will end during the Gila River Festival scheduled for September 27-29, 2024. A theme of the festival will be celebrating other wilderness advocates besides Aldo Leopold.

So get ready for a fantastic centennial celebration of the 100th anniversary of the Gila Wilderness in 2024. The Forest Service has established a website where events will be posted once the dates, time and location of these events become known: www.fs.usda.gov/goto/Gila100.

Two of the Tentative Logos under consideration for the Centennial Celebration







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