The Black Range Naturalist

Volume 4, Number 4
October 3, 2021

Our Contents

Call For Specific Content

We are considering an extended article on the common butterflies, and their caterpillar stage. The article is tentatively scheduled for April 2022.

If you have photographs of butterfly and moth species and/or caterpillars taken in the Black Range, preferably identified to species, and are willing to share we are very interested in seeing them/using them in this article. In the article, there will be a short section on the natural history of each species. If you would like to provide such a write-up that would be appreciated as well.

There is always the possibility of real success, that we will be deluged with material. In such a case, the article might morph into one of our e-publications.

All material (other than that provided by the editor) will be attributed.

Contact the Editor: Bob Barnes (rabarnes@blackrange.org) or
The Associate Editor - Harley Shaw
The Black Range Naturalist is a "Not For Revenue" Publication
Previous editions are available for download at this link (www.blackrange.org/the-black-range-naturalist/)

Unattributed material is contributed by the editor.

The Camera and Natural History - William L. Finley

Technology has a way of enhancing our study of natural history. It does not replace astute observation or a critical analysis but it does change the way we see. Technology rarely bursts on the scene full blown; it takes time to mature. Early adopters experience the thrill of doing things not done before and considering the exploration of topics not thought of before, and all too often, more than a small amount of frustration and exhaustion.

As late as the 1990's (possibly later) it was possible to attend a travel or natural history lecture/film presentation in the United States which featured a black-and-white silent film. These presentations were generally in large theaters. The lecturer, usually the person who had shot the film, narrated the presentation. This type of venue was a major form of entertainment for those interested in travel and natural history in the first half of the 1900's. William L. Finley was one of those who lectured on the presentation circuit. At the time, he was one of the most famous naturalists in the United States. In 1929 (April 6 - May 15), he and his support group shot Mountain Lion footage, which would be used in one of his presentations, in Arizona on the Blue River - just across the border from New Mexico. That film was used in a lecture tour in 1931. Announcements of two of his presentations are shown on the following page.

What Was *Nature Magazine*?

Nature Magazine was published by the American Nature Association from 1923 to 1959. It was an illustrated monthly which was founded by Arthur Pack and his father Charles. Arthur wrote the article referenced here. He was the husband of "Brownie Pack" (see elsewhere in this article). After divorcing Pack he married Phoebe Finley, William L. Finley's daughter. Among other things, he established (with Carr) the Arizona-Sonora Desert Museum in Tucson. ***Natural History*** (the magazine) absorbed ***Nature Magazine*** in 1960.

Finley is still a well known name in the naturalist community, especially in the Northwest of the U. S. The William L. Finley National Wildlife Refuge is named in his honor (because of his work on Refuges, not his filmmaking per se).

The February 1930 issue (Volume 15, No. 2) of ***Nature Magazine*** included "Trailing the Mountain Lion - And, What's More, Making Him Pose for Pictures" by Arthur Newton Pack with photographs by William L. Finley. The article describes the Mountain Lion photography/film trip.

Although the film at this link does not include Mountain Lion, it does include material from Arizona and New Mexico made during this trip. It includes footage of bats, rabbit, cholla, Ocotillo, desert scenes, filming woodrats, filming nesting hawks and owls, and a rather strange looking outfit meant to be a mobile blind. (The first few minutes of this film are material shot in Alaska.)

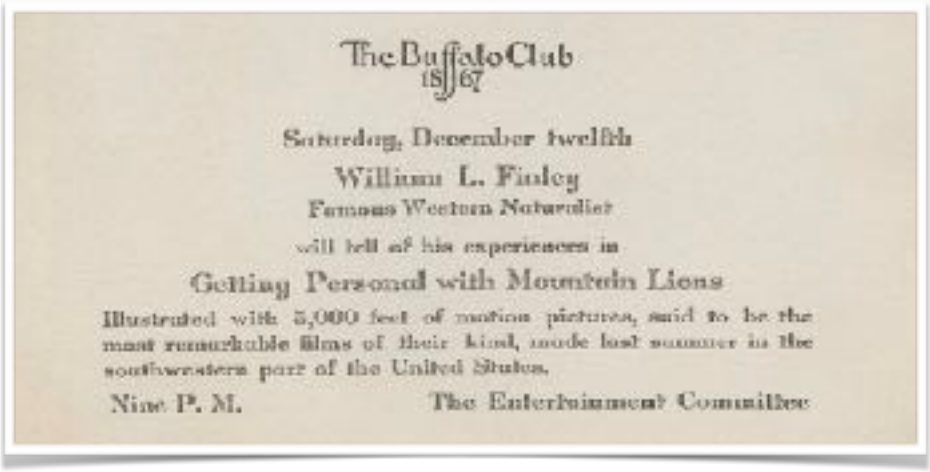
Finley's notes for "Getting Personal With Mountain Lions" are those he used in his presentations, including the following description of when a Cougar had been treed by dogs. (As with all of our quotes, it is verbatim and we do not use 'sic'.)

- "When we caught up with them they were under a big tree looking up and barking. Up about forty feet the old lion was resting on a big limb. Using a six inch lens we got a closer view, then all of a sudden as we were changing films the lion leaped down and away he went for another run. He was so quick that we failed to get the leap from the tree."

- "This time he was lower down so we could get a closer shot. He was snarling at the dogs and suspicious of the camera man. Again he turned and leaped and in the brush below was a vicious fight. Two dogs were injured. There was a quick shot from the lion hunter to save the dogs. The killing of the cougar ended the long hunt."

- "...the dogs discovered another carcass of a deer. A glance at the antlers showed that he had been a good-sized buck. Trailing from this place, instead of finding the mate we ran onto three cougar kittens. They were wandering about over the logs and crying in a high-pitched screeching whistle as if they were hungry...The kittens were not very old and were about the size of an ordinary tame cat. Since they didn't seem very much afraid of us and acted as if they were very hungry, we came to the conclusion that their mother must have been killed and they hadn't been nursed for two or three days. We took the kittens back to camp with us. Late

Irene Finley bottle feeding a Mountain Lion kitten, probably one of the kittens discovered on this trip.



The Buffalo Club
1867

Saturday, December twelfth

William L. Finley

Famous Western Naturalist

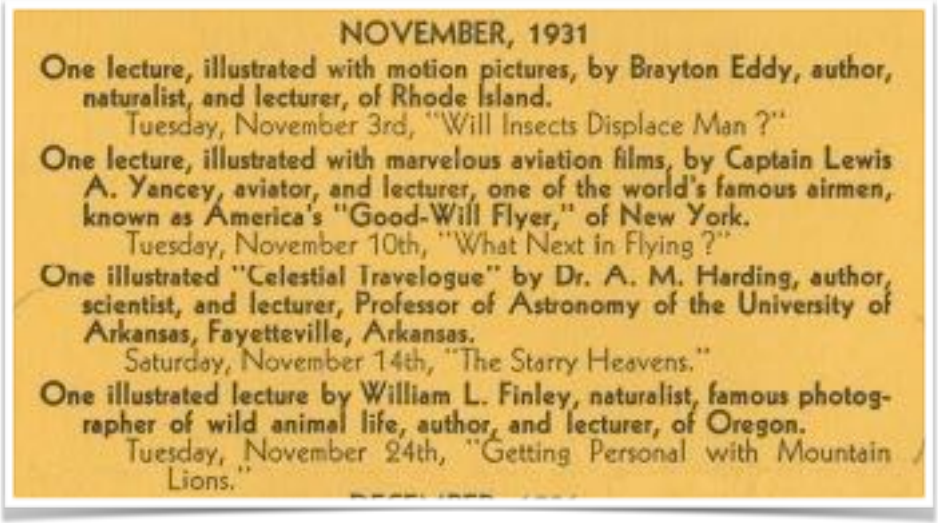
will tell of his experiences in

Getting Personal with Mountain Lions

Illustrated with 5,000 feet of motion pictures, said to be the most remarkable films of their kind, made last summer in the southwestern part of the United States.

Nine P. M. The Entertainment Committee

Announcing presentations by Finley in 1931.



NOVEMBER, 1931

One lecture, illustrated with motion pictures, by Brayton Eddy, author, naturalist, and lecturer, of Rhode Island.
Tuesday, November 3rd, "Will Insects Displace Man?"

One lecture, illustrated with marvelous aviation films, by Captain Lewis A. Yancey, aviator, and lecturer, one of the world's famous airmen, known as America's "Good-Will Flyer," of New York.
Tuesday, November 10th, "What Next in Flying?"

One illustrated "Celestial Travelogue" by Dr. A. M. Harding, author, scientist, and lecturer, Professor of Astronomy of the University of Arkansas, Fayetteville, Arkansas.
Saturday, November 14th, "The Starry Heavens."

One illustrated lecture by William L. Finley, naturalist, famous photographer of wild animal life, author, and lecturer, of Oregon.
Tuesday, November 24th, "Getting Personal with Mountain Lions."

that afternoon one of the hunters agreed to act as mother, to them. He got a bottle of milk and a nipple. This had no resemblance to the mother's breast but hunger and the sense of smell led the cougar kittens to begin sucking. With the taste of milk they all caught on to getting dinner. The babies must have a way of kneading the mother's breast, pushing, opening and closing their sharp claws. This may not be uncomfortable...to the mother on account of the heavy fur and skin of her breast but it was scratchy unless the orphans were served with leather gloves."

- **"The old mother next took to a tall tree where she sprawled out comfortably on a big limb. The sun was setting and it was too late for pictures, so with the dogs we bedded down at the base of the trees, built a fire and waited till morning...It just happened that there was another tall tree just nineteen feet from the cougar tree. The following morning I climbed this to get a nearer shot. As I climbed up my tree, he growled and went up further in his tree. One of the men below yelled, 'Look out. He may jump over in your tree.' I yelled back, 'Then I'll jump over in her tree.' While some people may think the mountain lion is fierce and dangerous, she is not looking for a fight with a human being. After perching in the top of the adjoining tree for over an hour and shooting her with a six inch lens, she paid less attention to the clicking of camera than she did to the howling dogs below. At times she even seemed to be dozing...she turned head downward toward those below and suddenly made a wild leap as far as possible, and was off for freedom. The old mother had given us such good chances to shoot with a camera that we were not interested in shooting her with a gun."**

The first page of the scene notes for this production is shown on the following page. The presentations which these films were produced for were significant events, performed all over the United States, in well booked tours. The newspaper article shown later, announces one such presentation, from the *Minneapolis Star and Tribune* of November 11, 1931. As noted to the left, Finley was farther east a month later, and there were many shows in between. (Much of the material presented in this article is from the archives of Oregon State University and from the collection of the Oregon Historical Society.)

The notice (left, on November 24) about the presentation in Memphis is from the Goodwyn Institute of Memphis, which made such presentations available to the public on a regular basis. This notice gives a hint, but just a hint, about the "business of natural history" at the time. There were many lecturers on the lecture circuit.

Finley was indeed a "famous photographer of wild life" in 1931, as noted in the Memphis announcement. His renown was not a flash in the pan, however. As early as 1910 he spent a substantial amount of time in Arizona and New Mexico, taking many still photographs. His presence in the area was noted by the U. S. Biological Survey, and they solicited his assistance in reviewing the status of what were to become National Wildlife Refuges in New Mexico. The solicitation letter from the Survey is copied in a later page in this article.

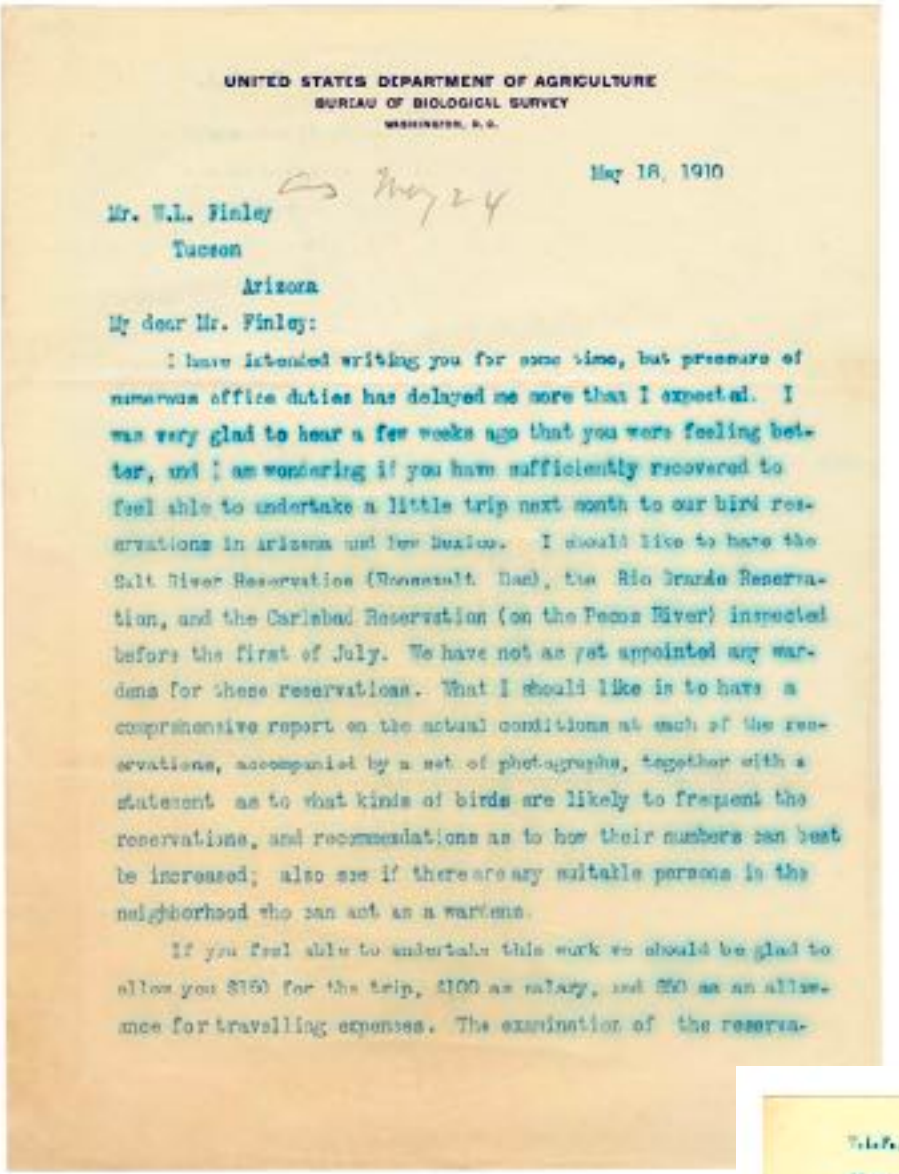
By the thirties Finley was an officer of several national conservation societies and a major force in rallying the public to the cause of protecting the natural places and wildlife of the country.

Finley made many films like the one described here. For instance, in early 1934, he produced "Fairy of the Flowers (Hummingbird) or Tiniest Soul in Feathers". The film notes are at this link.

His family accompanied him on many of his expeditions, but rarely on the presentation tours, and are often seen in his films and photographs.

GETTING PERSONAL WITH MOUNTAIN LIONS

Men in a corral roping horses
Horses that are packed
Horse with pack running across field
Close-up man packing mule
Distant view another mule with pack outfit bucking in the field
Distant view pack outfit crossing stream beyond two cliffs
TITLE- "Wild Turkeys"
Distant view of turkeys running away in forest and hopping over log
Flock of turkeys feeding in open field, second view little nearer, walking away
Close-up turkeys drinking among rocks in stream bed, taken with long lens
Another view of two turkeys
Deer jumping log and running away in forest
Single deer running to left
Several deer feeding in forest, jumping and running away (Salem)
Man on horse coming toward camera with dogs (Miller)
Miller and Pack on horses going away
Men moving away to left, turning and going up hill, hunting in grass
Two people on horses going down steep path to right
People on horses going away on side of cliff, distant view country beyond
Dogs and man hunting in snow, close view man discovers remains of dead deer, picks up skull with antlers
Man walking to right, dogs trailing
Three dogs running through woods
Three people on horses going down steep brushy hill
Dogs running through brush
Close-up dogs looking up and barking
Mountain lion on limb of large tree
Another view dog looking up, mouth open
Closer view mountain lion on big limb
Nearer view head and chest of lion on big limb
Two men on horses coming through brush
Man sitting in shady place with dogs looking up
Close view mountain lion mouth open and closing
Close view of heads of two dogs looking up
Closer view face of lion snarling
Distant view in big trees, dogs and lion fighting
Two dogs lying on open ground
Miller comes up and examines injured dog
Near-up front view raccoon on big limb
Horses standing in woods, man sitting
Another view raccoon sitting on limb and watching
Dogs and horse , man getting ready to move off
Man moving away along stream in canyon
~~Extreme~~ Close-up man picking up antlers and carcass of dead deer, dog smelling
Distant view man on horse examining tracks
TITLE- "Cougar Kittens"
Three cougar kittens coming over log toward camera
Three cougar kittens moving along the side of a log
One cougar kitten sitting on end of log, jumping down, another follows
Cougar kittens moving along beside log
Three cougar kittens coming from log in grass toward camera
Distant view horses, man sitting by fire
Nearer view man sitting on ground
Close view man looking and laughing
Man sitting on ground feeding three cougar kittens with bottle
Another view man sitting on ground looking and laughing
Additional view man with three cougar kittens on lap feeding them
Four people on horses climbing up steep mountain side, dogs following to left
Four people on horses going down mountain to left near big tree



UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

May 18, 1910

Mr. W.L. Finley
Tucson
Arizona

My dear Mr. Finley:

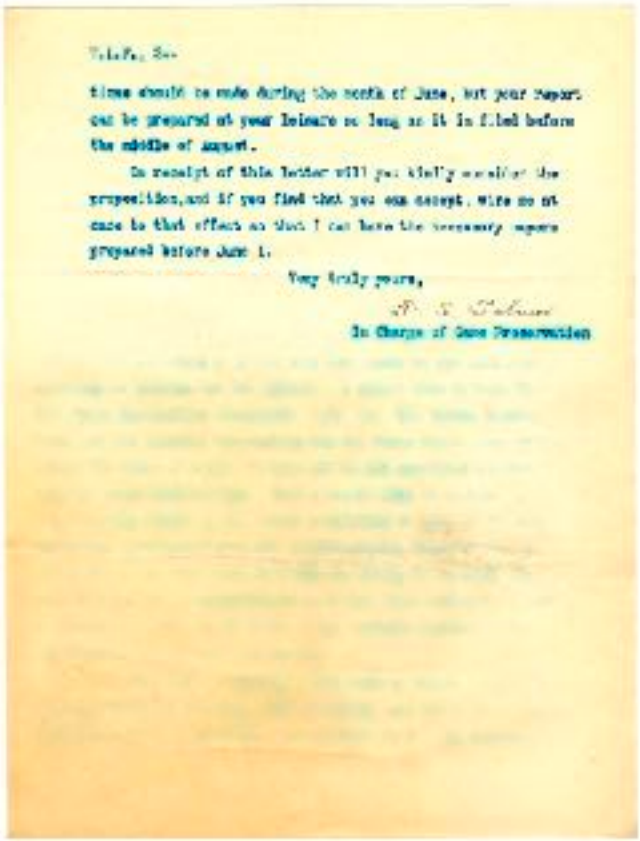
I have intended writing you for some time, but pressure of numerous office duties has delayed me more than I expected. I was very glad to hear a few weeks ago that you were feeling better, and I am wondering if you have sufficiently recovered to feel able to undertake a little trip next month to our bird reservations in Arizona and New Mexico. I should like to have the Salt River Reservation (Roosevelt Dam), the Rio Grande Reservation, and the Carlsbad Reservation (on the Pecos River) inspected before the first of July. We have not as yet appointed any wardens for these reservations. What I should like is to have a comprehensive report on the actual conditions at each of the reservations, accompanied by a set of photographs, together with a statement as to what kinds of birds are likely to frequent the reservations, and recommendations as to how their numbers can best be increased; also see if there are any suitable persons in the neighborhood who can act as a wardens.

If you feel able to undertake this work we should be glad to allow you $150 for the trip, $100 as salary, and $50 as an allowance for travelling expenses. The examination of the reserva-

negatives, the most remarkable record of American wild animal pictures ever made…During this time the Finleys have written three books…nearly 200 of their articles have been published in leading magazines and papers of America and Europe. Many full or double-page spreads of photographs have appeared in the New York Times and other newspapers…twenty different lecture seasons have taken Mr. Finley through nearly every state in the the Union… Three large Federal Wild Reservations and several state refuges in Oregon, stand as the record of his efforts in arousing popular interest to conserving our out-door resources."

Even when very successful, this can be a hard way to make a living, however. Finley's records are full of letters of inquiry asking organizations if they are interested in his presentations, there are constant negotiations with publishers about compensation for articles and/or photographs, and there is a nightmare of constant scheduling conflicts.

All of that is on the business side; the field work was not easy either. Finley did not simply get in his car and go some place to film with his cell phone. A photograph of him photographing from



W.L.F., Esq.

time should be made during the month of June, but your report can be prepared at your leisure so long as it is filed before the middle of August.

In receipt of this letter will you kindly consider the proposition, and if you find that you can accept, write me at once to that effect so that I can have the necessary papers prepared before June 1.

Very truly yours,

In Charge of Game Preservation

Finley's interests were far-ranging and included all of the areas of natural history. For instance, in 1941, he was writing about peccaries and the White Sands of New Mexico.

We often read and write about professional naturalists who made their living in academic settings or were employed by government agencies. Finley represents a different type of character, one who studied and documented widely and then turned the material from those efforts into something the general public eagerly consumed. He wrote articles for a wide range of magazines, sometimes submitting material for consideration, sometimes responding to specific requests. His presentation tours, his books, and his articles made him a respected authority on conservation in the United States, and he leveraged that respect effectively. It is not without reason that he had a National Wildlife Refuge named after him.

A summary of his publications was included in one of the flyers for the "Getting Personal With Mountain Lions" tour. It reads: "For the past twenty-five years Mr. and Mrs. Finley have hunted with cameras and notebooks… Twenty seasons of travel and adventure have produced over 200,000 feet of motion picture film and 25,000 still-life

"William L. Finley standing with his camera in the back of the buggy photographing a plumbeous gnatcatcher nest in a cholla cactus." 1910. Arizona - From the collection of the Oregon Historical Society

a buggy is typical of the effort involved. The camera is big, the horse doesn't want to stay still, and travel by buggy was not always that comfortable.

Besides the notes he used in his presentations, and for the article referenced above, there is a more extended account of the trip to Arizona and New Mexico. This account (probably written by Arthur Pack but possibly by Irene Finley) is enjoyable and can be read in its entirety at this link. The following quotations are from that account. Although somewhat redundant, it is not only more colorful and detailed, but varies somewhat from the two other accounts.

The camera equipment Finley took with him for the 1929 Mountain Lion film and photograph trip included: "the big Akeley camera in its box, the tripod, and three auxiliary cases. The first of these contains the film reservoirs, the second contains the nine-inch lens, the high speed crank, tools, and extra film. The third contains the seventeen-inch lens. We also have the Eyeno camera and its tripod. We have two large pack frames containing about nine thousand feet of extra film." These cameras are shown on following pages.

On this trip, he had contracted a lion hunter and crew to find Mountain Lions for him. To say that he was less than impressed with the cowboys would be an understatement. The lion hunter, Miller, proved to be competent, in the end. Although not the topic of this article, this narrative is an excellent description of a Mountain Lion hunt at that time.

At one point, it was noted that "lion hunting was entirely made up of lying and applesauce. It is also evident that wherever anybody is hunting lions there all the cowboys in the country who have nothing else to do, or who are willing to stop doing it anyhow, will flock." At this point they were down to beans and apples. They were experiencing the lack of a well-developed tourist infra-structure. "We all spent the evening around the fire, hunting lions and telling lies and watching the beans simmer." This extended description of the trip goes into greater detail about how the camera work was accomplished. The following are excerpts:

- "Frank Hodges carried my camera on his saddle horn, and Bill carried his own. I carried the tripod on my saddle horn. We had given up the idea of" (having) "a mule to tote the cameras, as the cameras were never ready when we wanted to take pictures." (p. 24) References to "Bill" refer to William Finley.

Akeley 35mm Cine Camera

Who is "Brownie"

On this trip was "Brownie Pack" who was later to become Eleanor Hibben (pictured above). Pack-Hibben was a wildlife cinematographer who worked around the world (all seven continents and 26 African safaris). Her work was featured in a Walt Disney Studios series, and she and her husband Frank Hibben (renowned anthropologist, big game hunter, and professor at UNM) had a network television series in the 1950's. She was the first woman president of the American Nature Association, which among other things published *Nature Magazine*, the magazine which printed the article by Arthur Pack (her husband at the time) and Finley which is referenced above.

Irene Finley photographing in 1919. Irene Finley was a well-known photographer and writer in her own right. William and Irene typically travelled and worked together, often with kids in tow.

1927 Eyemo 35mm Camera. This is one of the cameras used on this expedition, it had a 100 foot film capacity. When wound up the camera would run for about 20 seconds at 24 frames per second. It could also be "hand cranked". 100 feet of film will last about a minute.

Finley to Speak To-day

Hartford Daily Times 1-27-32

William L. Finley, naturalist, author, and explorer, will lecture on "Thrilling Personal With Mountain Lions" to-night at 8 p. m. at the Central Baptist church, under the auspices of the Hartford club for business and professional women. The talk will be illustrated by his latest motion picture of the same name, taken recently of the almost unknown regions of the southwest. Mr. Finley is well-known in Hartford, having lectured on a different subject at Bushnell Memorial last year. He is the author of several books on wild life, and of many articles in the National Geographic magazine and nature magazines. Tickets for the lecture are on sale at McCoy's, Gallup and Alfred's and the church office.

Minneapolis Tribune

Hunts Game With Camera

11-11-31

W. F. Finley, right, who has spent a good share of the last 30 years photographing wild animals and birds, was greeted by Dr. Thomas S. Roberts, professor of ornithology at the University of Minnesota, when he arrived in Minneapolis to lecture on his experiences with mountain lions.

Finley Describes Thrill of Taking Animals' Photos

Tells How He Sat Tight as Infuriated Mother Bear Charged at Him.

"Imagine my embarrassment, not to say consternation, as I knelt, camera in hand, and watched the infuriated mother bear charge toward me."

It was William L. Finley, photographer of wild animals for 15 years, telling the best "thriller" he could think of on hand from his numerous adventures.

"I was photographing some bear cubs in Yellowstone park," Mr. Finley told a group of the Sportsmen's club members of the Athletic club. "Suddenly the mother bear shot around the corner of a building 150 feet away and started toward me.

"There was no cover nearby and I had no gun. There was nothing to do but sit tight—or rather I had to sit tight. It was not necessary to stay there; it would have been foolish even to run from the charge.

"I was beginning to feel downright despondent about myself when the bear, at a distance of only about eight feet, suddenly stopped. She paused just an instant and then swung over to one side and disappeared. I didn't stay to see where she went."

Mr. Finley himself does not reveal in his appearance or speech that he spends nearly half of each year stalking bears, lions, deer and other wild animals over rugged mountains and through swamps and dog woods. He wears shirt, tie, glasses and speaks of his adventures as the college professor would discuss his collection of mounted butterflies or birds. He has visited countries all over North America, but he has very seldom carried a gun.

To Tell of Lions.

Mr. Finley will tell of some of his adventures at 8:15 p. m. Wednesday in the Lyceum theater where his subject will be "Thrilling Personal With Mountain Lions." His talk, illustrated with his own motion pictures, is under the auspices of the Hennepin County Sportsmen's club.

In the southwestern United States, where Mr. Finley got his mountain lion pictures, he saw the strange scorpion mouse. The scorpion mouse, which looks like the tail enemy of prairie dogs, stalks scorpions as a fish would stalk a deer. At the right instant, he leaps at the venomous poisonous fat winner. The mouse lets the kill roll before the scorpion can defend itself. The mouse seems to be immune to the poison, Mr. Finley said.

He also saw the kangaroo rat, which can go for two years without a drink.

"Squirrels in this part of the country are disliked by many foresters because they destroy young, but they are liked in the southwest because they eat grasshoppers," Mr. Finley said.

- **"My horse had a habit of jumping down from rock to rock, which, when his back was at an angle of about forty-five degrees, made it very difficult to hold on, especially with a tripod banging across one's knees." (p. 24)**

- **"This ridge was quite spectacular, so we stopped and took motion pictures of climbing and going through the brush and so forth. Bill seemed to take an endless time with his picture taking and camera loading. He couldn't decide what picture he wanted." (p. 25)**

- **"We packed one mule with the cameras, tripods, and a lot of extra film; also, water, coffee, and bread; and then we started up Stray Horse Creek" (p.27) to spend the night under the tree with the dogs keeping a Mountain Lion in a tree above the campers. They arrived just before dark and "We set up our Eyemo cameras with six-inch lenses and took some pictures of the lion in the tree from about a hundred feet away on the steep mountain side. This made only a fair picture, and we hoped and prayed that the lion would stay until morning, when we might be able to persuade him to change his position." (p. 27)**

- **"We had done all we could with the lion in his present position, and as we wanted more pictures, it was necessary to get him to change. A shower of small stones seemed to be all that was necessary…he came down head first…My camera was mounted on a tripod on the steep slope, where with the 6-inch lens I could get a good picture of his actions. Bill was well placed at an opening in the**

brush, and used only a 2-inch lens, so as to get a broader sweep. This combination worked excellently, for as the lion came out on the bare trunk, about twenty-five feet from the ground, suddenly and without any warning he leaped clear in one magnificent jump, striking the ground in close proximity to one of the dogs, a good thirty feet away from the base of the tree. His long body, with tail straight out, described a beautiful arc right in front of Bill's camera; and we only regretted that we did not have a slow motion machine to take the full value of his leap…I tried to follow the progress of the lion with my camera, but the brush was too thick. Swinging the lens around in advance of the lion's probable path, I sighted through the finder the great cat making up another tree, and began to crank…We all hurried down with our cameras, as rapidly as we could…Near it" (the tree the lion had climbed) "grew an almost exactly similar tree, the distance between the trunks being about twenty feet…Bill proceeded to avail himself" (of the opportunity) and "borrowed a rope from one of the boys and got him to throw it over a limb. Then with the aid of this he began to climb. It was slow work, and when he reached the first good limb he had to stop and haul up the camera, but Bill had climbed to the aeries of eagles and has a wonderful head for that sort of thing. Our guides and the cowboys looked on more or less aghast. In the first place they could not climb, and in the second place we were surprised to discover that they were more or less afraid of the lion. Bill kept on slowly working his way up the tree and hauling the Eyemo camera with him. The lion was well concealed in the branches of his tree, but as Bill kept on climbing so did the lion, until both the great cat and Bill were seated opposite each other on the last branches strong enough to hold their weight. I measured the distance between the two trees to check on Bill's focusing, and it was about nineteen feet. Bill looked at the lion, and the lion laid back his ears and snarled. We all looked on intently, watching for what would happen next. Bill was in his element and quite jovial. 'What shall I do if he jumps on me?' he called down. 'Throw the camera at him.' 'Do some heavy jumping yourself.' 'Change places

with him.' Various bits of useless advice were called up from below. The lion kept on snarling and Bill's camera began to buzz. I worked around the mountain side with my camera, trying to get a place where I could get both Bill and the lion in the picture. It seemed as if either one or the other was concealed by the limbs from every direction. Bill worked until his film gave out: then came part way down the tree and lowered his camera by the rope, exchanging it for mine, which Brownie had just reloaded. She spent most of her time sitting beneath the tree loading cameras. As the rope was not long enough to reach to the ground, and the limbs were too thick, anyhow, much time was consumed by these film changing operations, because Bill had to climb down so far and then up again. After a while the lion seemed to conclude that this rumpus was inevitable and composed himself again as comfortable as possible. Bill climbed back, this time with a six-inch lens, so as to get a full-sized close-up. The lion turned his back and acted quite bored by this picture taking business. Bill had to pull off bunches of pine needles and cones and throw them at the lion before he would come out and act properly belligerent. Once indeed the animal did come out on the limb as far as he could toward Bill, and for a few seconds those of us below held our breath to see what would happen. I had at last found a fairly good set-up and stood poised with my hand on the release lever, determined that inasmuch as I could not help Bill, I was going to get a splendid picture of his rapid demise. But the lion didn't have much bluff in him…when Bill climbed down for the second time to get his film changed, the lion sat licking his chops and decided to take a cat bath all over.

The next time the camera was sent up to Bill, he climbed to the very top and leaned as far as possible out of the tree to give me an opportunity to get both him and the lion to best advantage. He pointed his camera at the huge pussy cat and pushed the lever. Nothing happened, for one of the spools had been bent, and the film was jammed. Bill had to climb part way down again, and then down

William and Irene Finley working with one of their cameras in Arizona, earlier in the trip.

in a fork of the tree called for a changing bag and proceeded to straighten out the jam. I do not see how he ever had the sense of balance to stay there with both hands in the changing bag. Then he climbed back and finished his picture taking." (pp. 29-31) (Ed. They were, of course, working with unexposed film which could not be exposed to the light. A changing bag allowed work to be done on reels or film in a completely dark environment - all of the work had to be done by feel.)

The Finley effort described in this article is typical of the work which went into wildlife photography and filmmaking during this period. Although the film was made two hundred miles to the west of the Black Range, it is descriptive of the type of work that would have been done in the Black Range.

The story of climbing a tree to get good shots of the Mountain Lion is certainly romantic and has a bit of drama to it. The impression left with those watching the film is much more romantic and dramatic than the actual event. It is the nature of the art. Chasing Mountain Lions around the mountains with dogs so that you can tree them and get a good picture may not seem very kosher to you.

As late as the 1960's, staged scenes were used in television nature shows (*Wild Kingdom* with Marlin Perkins being just one of many examples).

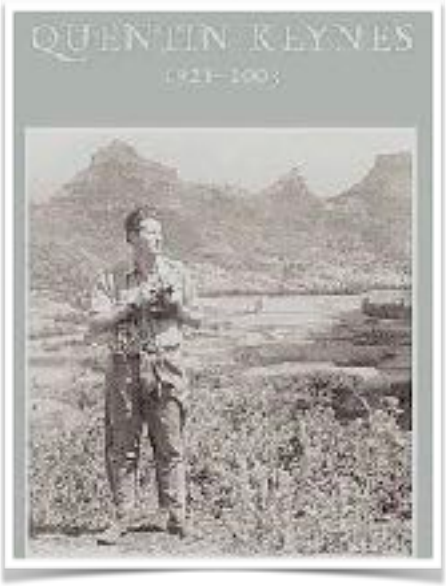
It is still common to use creative editing in producing natural history presentations. Knowing that the antelope the lion is stalking was filmed several months before, perhaps in a different country, certainly dampens the drama.

On the other hand, better financed efforts often use on-site crews which may be in an area for months. A BBC-type effort is fundamentally different from the work done by Finley. Independent film makers can not, typically, spend several months trying to get the perfect shot. Most people would consider the effort described in the notes linked to in this article excessive. There is, however, often a passion which drives individuals who are doing this type of work, and it has a lot to do with being able to do things which have never been done before.

How We Connect

by Bob Barnes

In the early 1990s, I attended one of the last of the presentation/lectures of the type which Finley made on his tours. A sold-out theater of more than 500. Most of those in attendance were older and may have attended some of these types of presentations in the waning golden days of that lecture form. The presentation was on Madagascar and, even though sharper color images with sophisticated editing and sound tracks could be seen on any television at the time, it was fascinating. Having a lecturer, who was almost very good, and a jittery black-and-white image, made it feel like I was sharing a bit of history.



And… At about the same time, Harley Shaw, Associate Editor of this magazine, hosted one of the last of the silent B&W movie photo tours at Sharlot Hall Museum in Prescott about five years before he moved to Hillsboro. The photographer and presenter was none other than Quentin Keynes, nephew of John Maynard Keynes and great grandson of Charles Darwin! One of the flyers which Keynes used to advertise his film/lecture tour is shown here.

There were several famous adventurers on the travel adventure presentation tour; many were more focused on the adventure part than natural history.

From the 1930s to 1960s, two of the most famous were Dana and Ginger Lamb. They traveled extensively, but that was not the hook. It was the nature of the travel which drew the crowds. For example, shortly after marrying in 1933 they set off from Southern California to New York City via the Panama Canal (not via Cape Horn as indicated to the right) - in a homebuilt 16-foot canoe. This trip was the basis for *Enchanted Vagabonds* (1938) which established them as major authors and actors on the lecture circuit. Many more adventures followed.

Those adventures were the subject of books, lecture tours, and movies. Their business model was completely integrated. For instance, their book *Quest for the Lost City* was the basis of a movie distributed by RKO in 1954. They sometimes hosted the presentation of the movie (see notice below). They took many notes and photographs and shot thousands of feet of 16mm film during their adventures, all fodder for their presentations, books, and films. The collection of their materials is maintained by the Sherman Library in Corona del Mar, California.

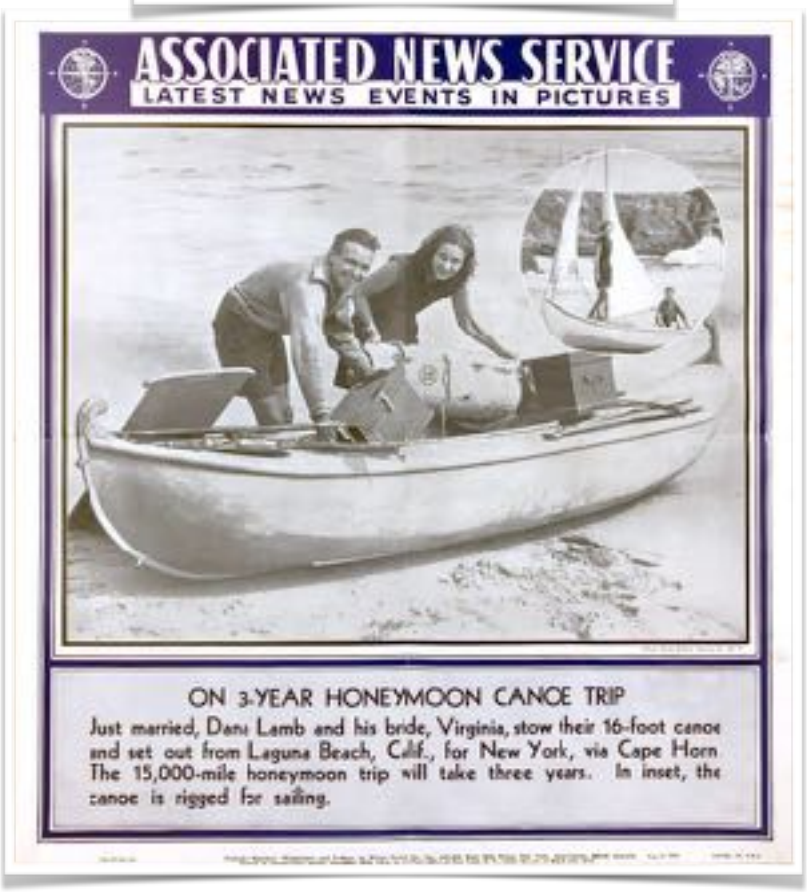
The Lambs were on speaking terms with both President and Mrs. Franklin D. Roosevelt as well as FBI Director J. Edgar Hoover. During the Second World War they collected intelligence on Axis activities in Mexico for the FBI.

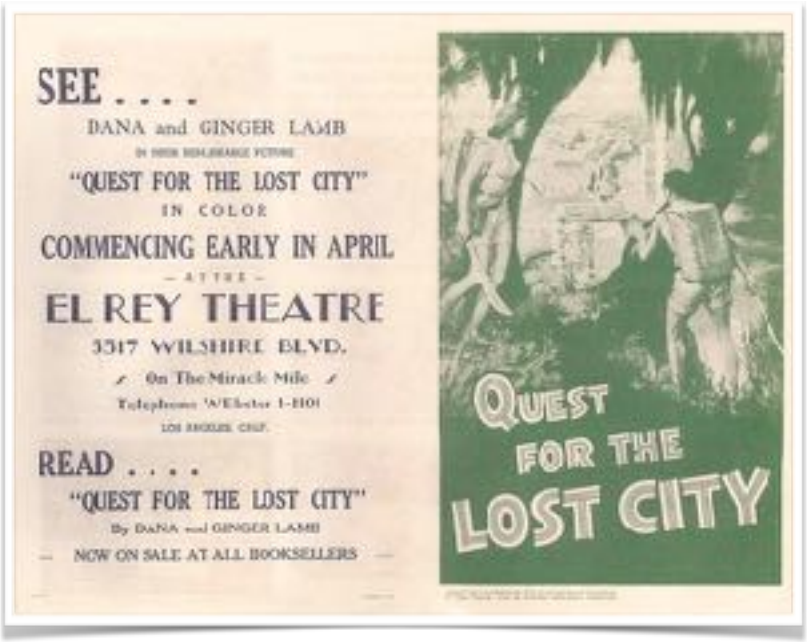
The connection goes well beyond the fact that they were travel presenters on the travel circuit at the same time that Finley was. In 1962, the Lambs moved to Hillsboro, on the east slope of the Black Range. (At least one of those 16mm film spools in the Sherman collection is of Lake Valley on the southeast edge of the Black Range, from 1963.)

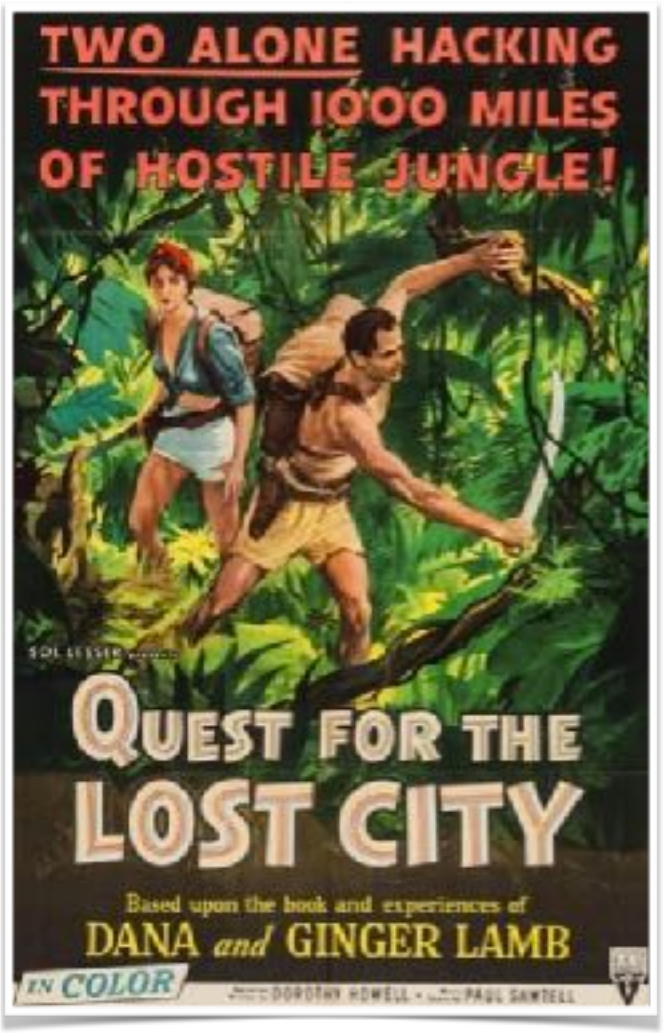
Although they lived in Hillsboro until their deaths (Ginger in 1967 and Dana in 1979) they still continued their travels and continued to report on their exploits.

On June 11, 1979, Dana fell off the high curb shown above right, across the street from his home in Hillsboro. He hit his head and died.

The connections are myriad. Getting back to the Finley saga, Arthur Pack,







Brownie's first husband, purchased the Ghost Ranch (of Georgia O'Keefe fame) in 1935. He had been a regular visitor to the ranch for years beforehand. Frank Hibben probably met Brownie while he was working on what might be the first field study of Cougars. They later married.

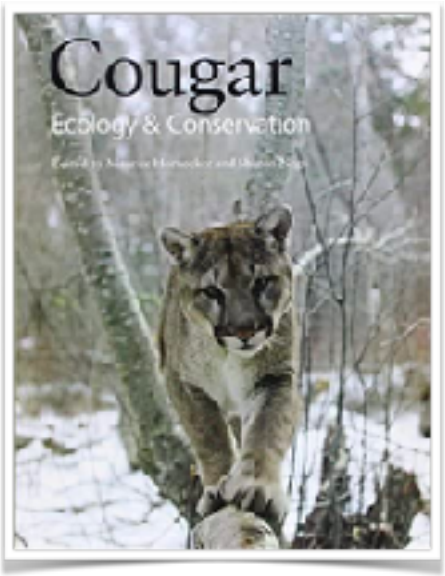
Frank Hibben's work was the inspiration for Maurice Hornocker's (and later Shaw's) work. Hornocker drew on Hibben's efforts and used his experiences treeing and studying pumas to design the next step: treeing and darting pumas and fitting markers and tags. Hornocker used film productions to advance his work, both technically and in promoting carnivore conservation. To that end, he produced three documentaries for National Geographic and several wildlife films for major American networks. The same thing Finley was doing, albeit with different technology.

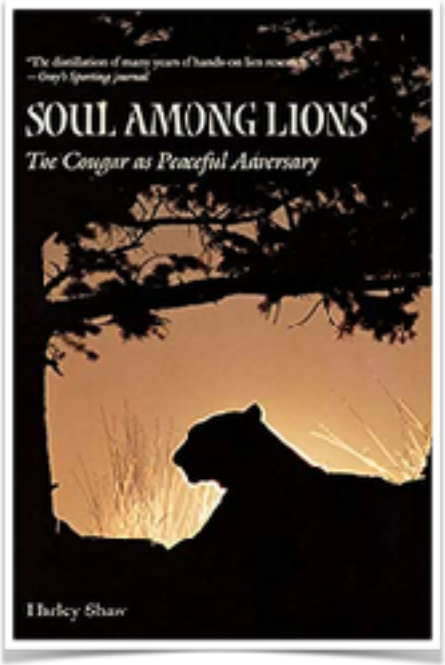
Then radio collars. I have been fortunate enough to work with Harley Shaw on two short video works: ***Dogs and Lions***, which describes his years of research, his role in developing modern telemetry technology and techniques, and his thoughts on where cougar research is going (39:41); and ***Trailing With Toasty***, in which he describes his natural history philosophy as defined by his latest research efforts - working with a Beagle and Desert Cottontails. The **April 2021** issue of this magazine includes an article about how *Trailing With Toasty* was made, continuing the saga of William Finley.

Finley and "Brownie" were at the inception of the documentation efforts associated with Cougar research. Hibben set the stage for later work with the big cats. Hornocker went on to become a leading authority in the field, researching, establishing research and conservation foundations, writing and editing. Editing ***Cougar: Ecology and Conservation*** in 2009, for instance.

And then on to Shaw with his many research efforts and books such as ***Soul Among Lions: The Cougar as Peaceful Adversary***, published in 2000.

Dana and Ginger Lamb as they began their ascent up the Coatzacoalcos River in Mexico.





Fast forward to this issue of *The Black Range Naturalist*. During the preparation of the article on Finley, Ron Thompson, who is doing a study of Mountain Lion population density in the Blue River area, the same area that Finley was traversing in his efforts, invited me to participate in a Mountain Lion capture. The opportunity was incredible, but I had to defer. Among my many weaknesses is a profound misunderstanding, and to some degree, mistrust, of horses. To make things worse, the horses understand my trepidation. It is not a good mix. The idea of riding a horse brings up a feeling of dread; the idea of riding one up and down steep slopes …

Finley's Red Mountain Lion - by Ron Thompson, Primero Conservation

As I arrived at the trailhead to Red Mountain in April 2021, located in the Blue Primitive Area, and parked at the base of Rose Peak at the Red Mountain trailhead on Arizona state highway 191, my mind drifted to William L. Finley's detailed field notes describing an exhausting two weeks of "lion hunting with a camera" - 90 years prior.

The basic method of hunting mountain lions (*Puma concolor*) has not changed much historically, not since humans bred dogs from wolves and then selfishly trained them to hunt various prey for humans, including mountain lions. Thus, when one of the first naturalist-wildlife documentary directors, Finley, decided to attempt to film the elusive cryptic species in 1929, he rightly selected lion hounds as the preferred method he would use to assist him in the capture of the footage of a mountain lion in its natural habitat.

Initially, starting in the Galiuro Mountains of southeastern Arizona, Finely and crew engaged the skills (and hounds) of Cleve Miller, a government lion hunter, to hunt in and around Powers Garden, the site of one of Arizona's deadliest and unfortunate gunfights in 1918 (Osselaer 2014). The wounds of that bitter fight were still fresh in the minds of area residents as Finley spent an unsuccessful week-long attempt to capture a mountain lion. Miller, who resided just "over the ridge" from Red Mountain, encouraged the touristy film crew to move to a campsite at the mouth of Stray Horse Canyon, located in the Blue Range, where he met them with fresh hounds and continued their hunt on April 24, 1929. This camp move was indicative of the lack of good mountain lion densities at that time in an area that today supports enough lions to supposedly necessitate the year-round taxpayer-supported employment of, yes, a government lion hunter, by area grazing permittees grazing on public lands. Finley's field notes describe a meeting of lion hunters:

> *"At breakfast time the two cowboys - Hugh Trainer and Joe Somebody-or-other - appeared again in time to eat. With them was a dark looking fellow, not very friendly in disposition, who proved to be Ben Black, Cleve's worst enemy - a rival hunter put in on this territory by Musgrave"* (Supervisor of the Division of Predatory Animal and Rodent Control within the Bureau of Biological Survey, now known as USDA's Wildlife Services). *"Ben Black had three more dogs to help steal our supplies. He said he had just come into this territory. Cleve said that if he had known Ben Black was here he wouldn't have come, that Musgrave had done him a dirty trick by putting someone else in on his territory."*

When the Finley party initially departed from La Quinta, California on April 8, 1929 to begin their quest to film the North American Mountain Lion in Arizona, its scientific name was *Felis concolor,* there were grizzly bears and Mexican grey wolves still roaming across the Blue Range, now designated as the Blue Primitive Area, and there was a state bounty on the mountain lion, now known as *Puma concolor*. At the time of his movie quest there were 32 described subspecies of the cat "of one color" (hence its name *concolor*). Today DNA analysis has reduced that number to just one species. Not even the Florida Panther is a unique subspecies, after a genetic introgression of genes from Texas mountain lions. Naturalists of Finley's era did not know that deoxyribonucleic acid existed.

Today, we can use linear regression models and DNA swabs collected from the distal ends of scat to determine minimum population sizes. The hard part is discerning a mountain lion scat from that of other predators, or even a human's. In a National Park Service attempt to collect lion scat to determine the connectivity of its monuments and parks in Arizona, only one lion scat was identified out of 100 scats collected. And, yes, they collected human scats!

Collecting mountain lion scats and analyzing them for months on end to determine population sizes is tedious and can dull your sense of smell. To that end, there are now genetic methods that can analyze hundreds or thousands of DNA samples at a time using advanced epigenetics techniques, including PumaPlex, a high-throughput assay to genotype 25 single nucleotide polymorphisms (SNPs) in mountain lions. In a recent past study PumaPlex was used in the analyses of 748 North American mountain lions and demonstrated its ability to generate reproducible genotypes and accurately identify each individual. PumaPlex produced significantly more genotypes (individual identifications) with fewer false alleles when compared with genotypes from 12 microsatellite loci tested in fecal DNA samples. Given the analytical simplicity, reproducibility, and high throughput capability of SNPs,

PumaPlex promotes cross-laboratory comparison of genotypes, is easily expandable in the future, and is a valuable tool for the genetic monitoring and management of North American mountain lion populations. Yet, not a single state is, as of yet, using this technique published in 2015 (Fitak et al. 2015).

Finley's campsite was located in a remote and rugged area, even today reached only by foot or horse and pack mule. It was soon to be designated as the Blue Primitive Area of the Apache-Sitgreaves National Forest in 1933, while its sister portion that extended into New Mexico was further designated as wilderness in 1980. Cattle ranching interests, roads and infrastructure kept the Arizona portion in its current "primitive status". During the lion hunt, April 26, 1929, Finley wrote;

> *"...and then we started up Stray Horse Creek. At one place we had to dismount and lead the horses over a particularly bad rock; but then we kept on up to the drift fence and southward along it toward Red Mountain. This route was very much better than the one the lion had taken; and indeed, accustomed as we were to the tough going, it did not seem bad at all, except for a very steep climb from the end of the drift fence to the first ridge on top of Red Mountain. We topped out, as is the expression is in this country, crossed the saddle through the brush, and climbed up again along the ridge."*

Currently there is a study to use 99 paired-camera sites as depicted in Figure 2 to determine the population density of mountain lions in a management zone in northeastern Arizona. This entails placing the cameras within a specified grid on the landscape and then marking with GPS collars 10-12 mountain lions. As the marked animals wander the zone they are "recaptured" on cameras.

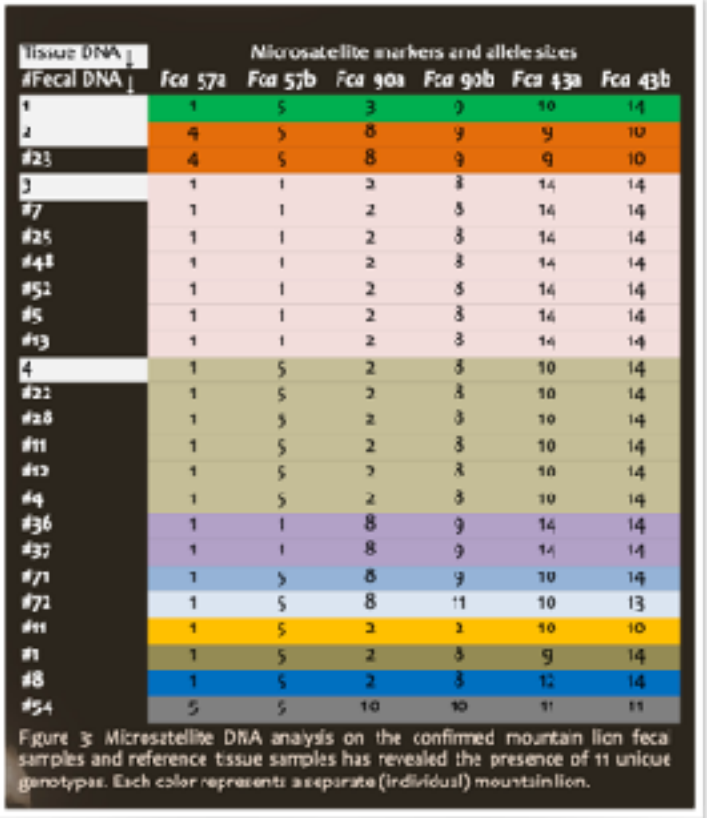


Figure 1. (Ignore "Figure 3" on the image.) This figure was used in the determination of the minimum population size of mountain lions on the Kofa National Wildlife Refuge. Genotypes unique to a single individual are identified from DNA from scat. You collect scat until you start to identify only the same mountain lions over and over - hence a minimum population number.

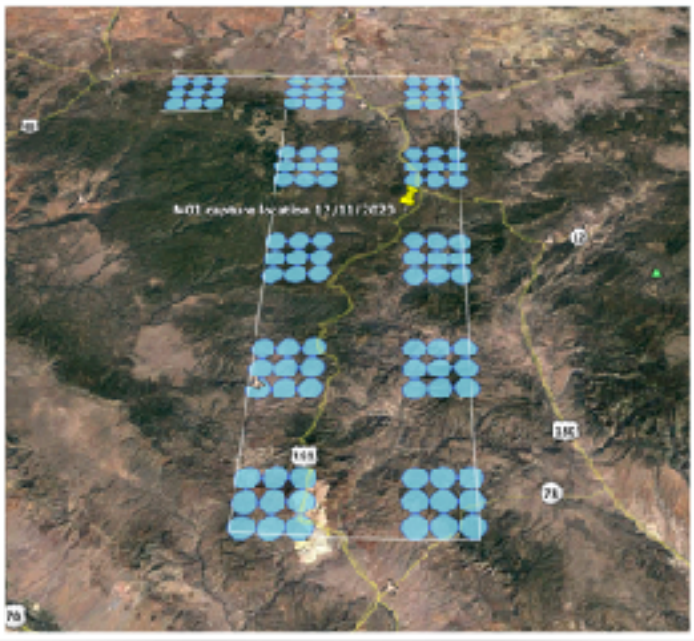


Figure 2. Spatially explicit models generate camera placement centroids by computer to capture marked (collared) or unmarked mountain lions to obtain occurrence/density data, and when combined with GPS movement, statistically valid estimates of population sizes.

A model using mountain lion movement input parameters then compares captured marked animals to unmarked camera trapped animals. The model was implemented in northern New Mexico and published in a peer-reviewed journal by Augustine et al. in 2019. The information from this study greatly reduced the density estimate of mountain lions in New Mexico and subsequently the allowable harvest level.

We are still using camera techniques (Figure 3), initially inspired by Finley's efforts to capture a mountain lion and bring the real-life images to the public. During Finley's capture, the Red Mountain lion was held at bay by hounds all night in a tall ponderosa pine so that filming could be accomplished in the next-day daytime light. Such a practice is now outlawed by many states. Eventually, the Red Mountain lion incurred the same fate as many of his kind do across the western United States;

> *"We had no evidence he had killed any calves recently, and besides he had acted very nicely for us. The girls wanted to go away and let the lion go; and Bill and I were strongly of the same mind. However, here was a serious complication. Although Cleve Miller had been hired by the Biological Survey as their crack lion hunter, still he had agreed to let the lion go, if we wanted to; but there were two cowboys present who had stock in that part of the country, and a rival lion hunter whose record we knew was not very good recently. Even if we departed it was more than likely that Ben Black would stay around and get that lion sooner or later and take credit for it with the Biological Survey authorities, when the credit really belonged to Cleve Miller, or at least to DeWitt Cosper who had kept Miller at it. Albert Hall was sitting by with his rifle across his knees, looking*

Figure 3. Cell cameras that send photos instantly to your iPhone can monitor foot snare sets 24/7 and notify researchers when a mountain lion is captured so researcher response times are immediate, and time spent in a foot snare are limited. The snare is set in the rocks in front of the unsuspecting mountain lion to be collared. The stick over the snare eliminates the capture of ungulates walking the same wash.

anxious. Cleve was distinctly worried, and there was a sort of tension in the atmosphere, so I told Albert to go ahead and shoot."

Management of mountain lions in the western United States has been a contentious issue for decades. In Texas, mountain lions are legislatively classified as "vermin", and you can chain them up in your yard or leave them in foothold traps for weeks on end. Multiple political, social, and economic interest groups exert varying influence on mountain lion management policies that are annually implemented by state wildlife agencies. Disputes among interest groups and state agencies over mountain lion management have increased in frequency in recent years, with threats of litigation aimed at banning various methods of legal harvest or prohibiting legal harvest altogether having become commonplace. Most disputes have been predicated either partially or entirely on state wildlife agencies' lacking contemporary and statistically supported estimates of mountain lion population sizes and densities. Such is the case in many western states where scientifically supported, rigorous population estimates within court-defensible confidence intervals for mountain lions do not exist. Thus, research to obtain reliable population size and density estimates for mountain lions is eminently important and needed. Scientifically rigorous data and estimates that are defensible are crucial to ensure that the wildlife agencies we, the public, entrust our wildlife resource management authority to, have a reliable basis for this management and for providing hunt opportunity for public harvest in a sustainable manner.

Although Finley was highly interested in the ecology and habits of mountain lions, he committed to no scientific study of the species. And yet, 90 years later, we still have a limited knowledge of how to timely and effectively determine "the number of jellybeans (mountain lions) in the jar (a defined habitat area). Capture-collar-recapture studies are the most definitive, and the book, *Desert Puma*, is the best result of such research methodology. *Desert Puma* which describes the ecology of the mountain lion of the San Andreas Mountains, New Mexico was written by local scientists Ken Logan and Linda Sweanor. The authors now reside in the Black Range almost next door to longtime Hillsboro retired lion biologist Harley Shaw. Mountain lions are still amongst us, despite our efforts to "manage" them. The Black Range and Blue Range would not be the same without their presence, and the ecosystem services that they provide us as humans.

Ron Thompson and Mountain Lion

PRIMERO CONSERVATION is an established 501(c)(3) nonprofit that works with ranches, landowners, and other organizations in Arizona, New Mexico, and Sonora to improve wildlife habitat and provide alternative solutions to wildlife conservation and natural resource management while complimenting social and local economic development.

Ron Thompson is a board member, and President, of Primero Conservation.

Trail Cam Photography

Self actuated cameras have become a core tool in wildlife research because they are reliable and inexpensive. These cameras, commonly called trailcams, are widely used for multiple purposes including surveillance, security, hunting, and most importantly, research. It is possible to come across one just about anywhere. The one shown here was along the trail to Sawyer Peak.

First of all, trailcams, are cameras in special packaging which are integrated with a sensory system used to activate the camera. They are multipurpose cameras and can take either still or moving images (photography or video). The resolution of the image these cameras take will vary with model, but high resolution images are the norm. Cameras of this type are generally activated by an integrated motion and/or heat detector. The effective range of the sensory detector will also vary with the model of camera.

A trailcam generally includes several batteries in its case, meaning that it can remain active for long periods between battery recharge or change out. Although the sensory array must remain at some level of activity all of the time (this setting will also vary between models), the camera is only taking images when it is activated. That means the camera uses fairly low levels of energy and, thus, battery life can be substantial.

A camera will activate once movement is noted by the sensor, generally in less than a second. The shorter the lag period (called trigger speed) the better. Cameras which trigger in less than half a second are commonly available. Related to trigger speed is something called recovery time, that is, how soon after taking an image will the camera be ready to take another image. Recovery time is generally not a technical issue, per se. The camera will generally be capable of taking another image in much less than a second. The user may, or may not, want the camera to take another image in so short a time. Therefore, most cameras will allow you to set the recovery time based on your perception of the value of lots of shots once the camera is activated versus one, or a few shots, so as to prolong battery life or save image storage space.

The sensor range can also be customized on many cameras. Does an object have to be very close to the camera before an image is taken or can it be relatively far away? Does the object have to be centered in front of the camera before the camera takes an image or can the camera be activated when the object is to one side or another (to varying degrees)? There are several things to consider when making decisions about sensor range. If a sensor is set to activate the camera when an object is fairly far away - and the recovery time is set to the minimum - the camera may take a significant number of images, using lots of storage and battery life, for instance.

There are a range of considerations involved in night photography with a trailcam. Such photography generally requires a flash. Using a flash to take an image uses more energy than not using one. There are three kinds of flash which are generally available. A white flash allows color photographs to be taken but may startle the subject being photographed. A red, or low-glow, flash illuminates the subject with light which is just outside the light spectrum visible to the human. To a human, a flash of this type will not be visible or will be just barely so; remember, however, that the subjects you are photographing have different sensory capabilities than humans. This type of flash may still startle the subject. It enables the camera to take black-and-white (grayscale), but not color, images. The other type of flash which is generally available is called black or no-glow infrared. This flash uses light which is farther outside the light spectrum visible to humans than the red flash. This flash is used for grayscale photography but not color and rarely, if at all, startles mammal subjects.

The range (from camera to subject) for which a flash will be effective also varies with camera model. While illuminating a subject a substantial distance away is one factor to consider, another is the possibility that a flash will "blow out" a subject which is to close - that is, the photo will be greatly overexposed and have little detail.

Most trail cams use standard memory cards for storage. Some cameras can transmit images via cellular service, not a very good option in the Black Range where there is very little cell coverage, but something to consider if you need immediate feedback about what is walking in front of a camera.

Trailcams can be mounted and secured using a variety of techniques.

This listing may seem to be complex and varied, but if you think about what and how many images you desire to take, the set-up process is easy.

One of the major attributes of these cameras is that they can be placed and then checked weeks later. How much later will depend on the decisions you make in setting up the camera.

The A-Spear Trailcams

Photos by J. R. Absher

J. R. Absher, at the A-Spear Ranch, maintains several trailcams and has monitored the wildlife of the ranch for years. The American Black Bear (*Ursus americanus*) was photographed in July 2020. The Cougar (*Puma concolor*) photo is one of a series of photographs taken in January 2021. The young

Coyote (*Canis latrans*) was photographed on a warm day in August 2019. The ranch has had nesting Common Black Hawks (*Buteogallus anthracinus*) for years, and they regularly hunt for crawfish in Palomas Creek. The one shown here was photographed in June 2019.

This magazine has published photos from J. R.'s trailcams on several occasions, including *Trailcams, Citizen Science and the Black Range Region*, an article he wrote for the January 2019 issue.

Trailcam Skunks

Furman University has conducted a Mountain Lion research project along the east slope of the Black Range for more than a decade. During that time the trailcams which it uses in its research have captured tens of thousands of images. Not all of those images are of Mountain Lions.

In June of this year we searched through 2,150 photographs of skunks taken by the project's trailcams in the Animas Creek drainage on the east side of the Black Range. Amazingly, those photographs included images of four species of skunk.

When I say skunk, most of us will automatically think of the Striped Skunk, *Mephitis mephitis*. However, in our sample the species most frequently recorded on trailcams in the Animas drainage was the American Hog-nosed Skunk, *Conepatus leuconotus*. The least frequently photographed species was the Western Spotted Skunk, *Spilogale gracilis*. The Striped Skunk and the Hooded Skunk, *Mephitis macroura,* were also frequently photographed.

We have included some of these trailcam skunk photographs in the following material. Special thanks to the team from Furman and to the research lead, Dr. Travis Perry, in particular, for allowing us to review and utilize this material.

American Hog-nosed Skunk

There are four species of Hog-nosed Skunk in the Americas. Only the American Hog-nosed Skunk, *Conepatus leuconotus,* (range shown below) is found in our area. There are three sub-species; only the nominate form is found here. Individuals formerly included in *Conepatus mesoleucus*, the Western Hog-nosed Skunk, are now considered members of this species.

This species is identified by the following traits:

- The top third of these skunks is pure white;
- Their tails are completely white;
- They lack the white line which runs from the crown to the nose, in other skunk species; and
- They have a flattish naked nose pad reminiscent of that of a pig or hog.

Members of this species are some of the largest skunks in the world and can reach lengths of a little more than three feet, and they can weigh almost ten pounds. Trailcam images of this species far outnumbered those of other species in our sample, which consisted of all images taken from 2008-present. They may not be the most common skunk species in the area, however, only the most photogenic.

Western Spotted Skunk

The latest research indicates there are seven Spotted Skunk species. The Western Spotted Skunk range map shown to the right (maps courtesy of IUCN Red List of Threatened Species, species assessors and the authors of the spatial data., CC BY-SA 3.0) does not reflect these latest findings. There are seven subspecies of *Spilogale gracilis* which are currently recognized. The one found here is *S. g. leucoparia*. Some authorities consider this species to be a subspecies of the Eastern Spotted Skunk, *S. putorius.* The difference in striping on this species is the easiest way to distinguish it from the Eastern Spotted Skunk. The stripes on this skunk are dramatic and distinctive.

This species is small, the total length of adults being between 14-18 inches. Adult males can weigh up to 26 ounces, 1.6 pounds, which is less than a fifth of the weight of an American Hog-nosed Skunk.

Like other skunk species, the Western Spotted Skunk is an omnivore, feeding on insects, small vertebrates (mammal, reptile, or bird), and a variety of vegetative matter (roots, berries, fruit, grains, etc.). They will eat found flesh (carrion) as well as kill prey.

Like other skunk species, they have musk glands and they are able to spray musk at those creatures which are threatening them. Skunks will generally give warning before spraying a would be attacker. Typically, skunks will stamp their feet and bend their bodies so that both their rear and face are pointed at the aggressor - but not spotted skunks, they do handstands. There are various home remedies which are touted as ways to decrease the smell which seems to cover your clothing and body, should you be sprayed.

On the other hand, small portions of very toxic materials (animal venom, for instance) are often used in medicines. And, small portions of skunk musk are found in some perfumes.

Hooded Skunk

The Hooded Skunk, *Mephitis macroura*, and the Striped Skunk (see following) were not as common in the images of our data set as the American Hog-nosed Skunk but from the sample it appears that both are fairly common.

Hooded Skunks have very long tails and this is a distinguishing feature. There are three color morphs of this species: one with the central area along the backbone (dorsal) colored black with two lateral white stripes; one which is white backed like the American Hog-nosed Skunk, but often having some black in the tail; and one which is black with a few white hairs. All of the color morphs exhibit the white stripe down the center of the face.

The black color morph is easily distinguishable, and the white-backed morph is easy to identify, if you have a look at the face (white stripe down the middle of the face = Hooded Skunk versus no white strip = American Hog-nosed Skunk) or tail (completely white in the American Hog-nosed Skunk versus some black in the Hooded Skunk). The other color morph (black dorsal stripe bordered by white stripes) can be difficult to distinguish from the Striped Skunk (unless you are able to see the very long tail of the Hooded). Although many authorities tout the extended area of white down the sides of the nape in the Hooded as an identifiable trait, it can be difficult to discern.

The range of the Hooded Skunk is shown above (maps courtesy IUCN Red List of Threatened Species, species assessors and the authors of the spatial data., CC

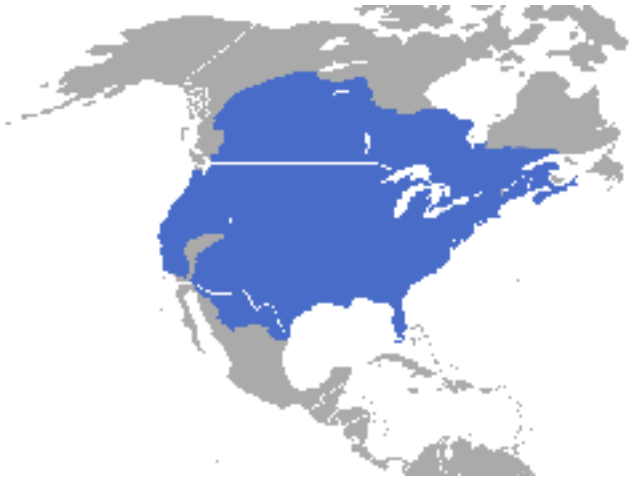
BY-SA 3.0). There are four subspecies of *Mephitis macroura; M. m. milleri* is the subspecies found in our area.

Individuals in the southern part of its range may be only half the size of those found in our area. With tail, the length of this species will reach about two feet (790 mm). Large males may weigh close to six pounds.

Although this species is an omnivore, it appears to be especially fond of prickly pear.

Striped Skunk

Of the species found here, the Striped Skunk, *Mephitis mephitis*, has the largest North American range. (See map to the right, courtesy of Udo Schröter.) There are currently thirteen subspecies of Striped Skunk which are recognized. The Arizona Skunk, *M. m. estor*, is the subspecies which is found here. In *Revision of the Skunks of the Genus Chincha*, Arthur H. Howell described the color of this species as "White stripes on back very broad - almost confluent; posterior back wholly white in some specimens; tail of black and white hairs, the white longer and chiefly on the upper surface, where they extend beyond and nearly conceal the black; white pencil at tip . . . Total length, 639 mm", or about 29 inches (pp. 32-33). This subspecies is depicted to the right, from Plate II of the cited work (above). Although the taxonomy has changed since this work was published at the beginning of the last century, it remains an excellent source of information.



The Striped Skunk is the species of popular literature and cartoons.

The Photographs

If you are looking for artistic images you may wish to use technology other than a trailcam. These are instruments of documentation and they do that very well. The quality of the images will vary, but can be remarkable sometimes.

On the following pages, we share a set of photographs which we believe depict the natural history of the skunks of the Animas drainage quite well. Since skunks are mostly nocturnal, these are all night shots.

It was uncommon, but not that unusual, for there to be another species in the images we reviewed and, although skunks tend to be solitary, there were images which included more than one individual (three individuals on one occasion). We also found four images of Common Gray Fox and various skunk species in the same frame, apparently hunting together.

Special Thanks

To Dr. Travis Perry and the Furman University team for granting access to the skunk images which follow and to Harley Shaw for his search efforts in sorting Furman's extensive image catalogue.

American Hog-nosed Skunk
Conepatus leuconotus
Animas Drainage, Black Range, NM
Here and on the following page.

July 8, 2009 1:00 A.M.

May 17, 2014 11:18 P.M.

August 10, 2013 10:29 P.M.

December 14, 2008 12:21 A.M.

March 10, 2010 4:43 A.M.

June 27, 2019 3:47 A.M.

October 20, 2008 7:23 P.M.

April 28, 2009 3:57 A.M.

Western Spotted Skunk
Spilogale gracilis
Animas Drainage, Black Range, NM
Here and on the following page.

Speciation determinations are always fluid. In "Phylogenomic systematics of the spotted skunks…", *Molecular Phylogenetics and Evolution*, 22 July 2021, McDonough, Ferguson, et al. propose six species of Spotted Skunk in the United States: Eastern and Western clades of three species each. A seventh species has been described in the Yucatan.

September 3, 2008 9:27 P.M.

June 30, 2018 2:03 A.M.

July 18, 2009 1:48 A.M.

August 24, 2008 12:01 A.M.

January 19, 2010 6:32 P.M.

December 4, 2014 4:07 A.M.

August 1, 2009 3:39 A.M. With Common Gray Fox

Hooded Skunk
Mephitis macroura
Animas Drainage, Black Range, NM
Here and on the following two pages.

November 29, 2008 1:19 A.M.

May 19, 2010 12:36 A.M.

December 17, 2008 7:24 P.M.

December 21, 2008 5:19 A.M.

August 9. 2009 9:24 P.M.

November 12, 2010 10:59 P.M.

December 21, 2008 5:01 A.M.

December 21, 2008 239 A.M.

December 14, 2010 12:12 A.M.

December 14, 2008 12:21 A.M.

Hooded Skunk
Mephitis macroura
Animas Drainage, Black Range, NM

July 30, 2011 5:34 A.M.

December 20, 2014 7:07 P.M.

October 3, 2010 9:20 P.M.

Striped Skunk
Mephitis mephitis
Animas Drainage, Black Range, NM

July 15, 2009 10:57 P.M.

March 15, 2013 10:54 P.M.

November 11, 2008 10:10 P.M.

October 8, 2012 4:40 A.M.

August 2, 2016 2:30 A.M.
American Hog-nosed Skunk

May 21, 2014 4:11 A.M.
American Hog-nosed Skunk

December 27, 2011 2:40 A.M. Striped Skunk

August 7, 2015. 8:57 P.M. Hooded Skunk

"Skunks and gray foxes in a tropical dry region: casual or positive interactions?", Gabriela Pérez-Irineo, Salvador Mandujano and Eva López-Tello, *Mammalia*, Volume 84, Issue 5, pp. 469-474.

Travis Perry reports that he saw similar interaction between fox and polecat in South Africa during his research there, and that the local people indicated that they "were hunting buddies".

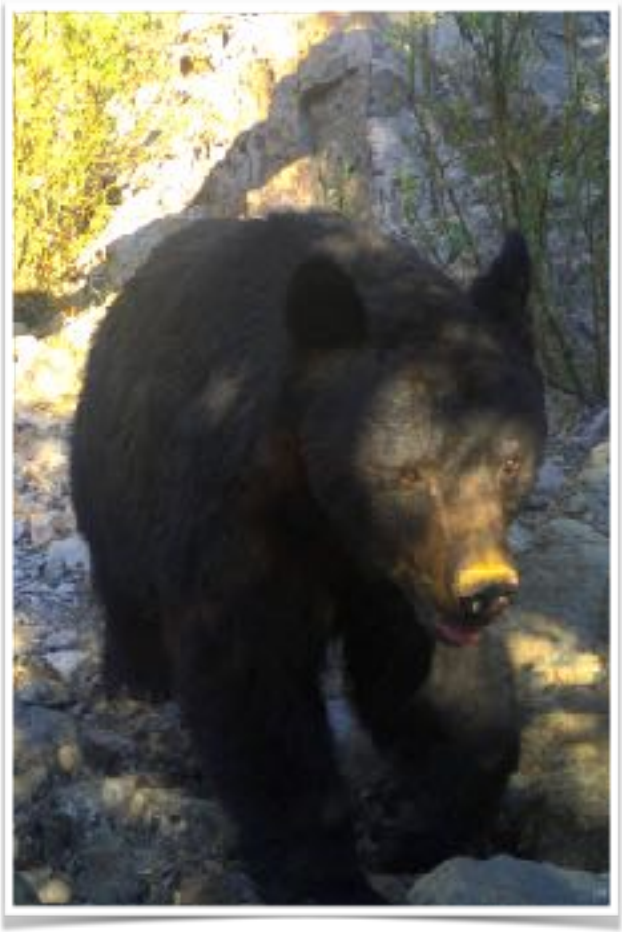
We are happy to add to the body of factoids in this emerging area of natural history research.

The survey of skunk photos turned up these four images of Common Gray Fox and skunk (two, possibly, three species) in the same frame.

There are reports of skunk and fox apparently hunting together from other locations in the Americas (see

Trailcam - Case Study

The photographs in the previous articles demonstrate some of the "rewards" of deploying trailcams: interesting photos and a deeper understanding of what is happening in the world around you, for



starts. But what is the "return on investment"? A case study of a trailcam deployment may be informative. The photograph above is a cropped image of an American Black Bear taken from a trailcam photo. The photograph is from Mineral Creek on the east slope of the Black Range, where a trailcam was deployed for four weeks during June 2021. After placement of the camera, the site was visited after two weeks to download the initial set of images, check framing, etc. At the end of four weeks the camera was retrieved.

This period was very dry, and the site selected for deployment was a small pool of water about one and a half miles west of FR 157 (North Percha Road) in Mineral Creek. Over the course of the four weeks the water went from a small pool to nothing.

Most of the material recorded during that period was of Mule Deer, followed by domestic cattle. After the images of domestic cattle were deleted, there were slightly more than four minutes of video and twenty-five useable still images remaining. The video and still images have been made into an 8:28 minute video clip which may be watched at this link. Each still is shown for ten seconds and the clip title is 14 seconds long. Of the 8:28 minutes, five minutes of material is of Mule Deer.

This video includes: American Black Bear, Steller's Jay, Rock Squirrel, Sharp-shinned Hawk, skunk (unidentified as to species), Gray Fox, and Mule Deer.

At some point during the last two-week segment the camera was knocked from its mount, apparently by a cow. It continued to record material even though it was upside down after being knocked from its mount. All of the American Black Bear video was recorded during this period. That video had to be rotated during post production; although looking at what appeared to be a bear walking across the ceiling of a cave, and not falling down, was amusing for a while, we decided that it should be rotated.

Other than the effort of finding a deployment site and monitoring or retrieving the camera, there are some other potential costs to such efforts.

Losing your camera is always a possibility. Two major risks are present when a trailcam is placed. Another human may decide that the camera is going to belong to them from that point forward. Security cables can be something of a deterrent. Secondly, depending on where you place the camera (washes and stream beds are good places), there is always a possibility that it will rain. In such an event, flash flooding is a possibility. Most trailcams are capable of weathering a submerging event, but if it is washed away (along with the log you attached it to) you may not find it again.

Since trailcams are often deployed for long periods, and are generally unattended during that time, a number of other events may occur which will diminish your "image acquisition". The short video clip (less than half a minute) at this link shows a wildfire passing through a trailcam site.

The title background of the Mineral Creek video is an image taken by the trailcam when it was knocked from its mount - our cows are artistic.

Dark-ribboned Wave - *Leptostales rubromarginaria*

We found the *Leptostales rubromarginaria*, Dark-ribboned Wave, (pictured below and at the link above) along the Black Range Crest Trail (Hillsboro Peak Trail) of the Black Range, New Mexico, in mid March of last year. In the world of identification, butterflies are difficult, but moths, that is a whole different level of difficulty entirely.

This moth is proof that they are not all dingy gray and brown. Although some of the moths of the genus are, in fact, gray and brown, this individual is certainly not. As we walked, this individual fluttered up from the trail. With a wingspan of less than 20 mm, it was quite small.

The identification of this individual required the help of the folks at the Iowa State University Department of Entomology. But eventually I got there. This species was known as *Acidalia rubromarginaria* for a short period but was placed in its current genus by Alpheus Spring Packard in 1871, the year he made the original description. The Mississippi State University Mississippi Entomological Museum site was also helpful in the identification of this individual.

An Overview of the Mammals of the Gila Region, New Mexico[1]

Jones et al. have published a survey of the mammal life of the Gila in *Therya*. The work is extensive and a description of findings is beyond the page limits of this issue. We refer you to the article (at link).

The referenced study used camera trap photos as an input in their research. A small subset of their findings is shown below (graphic and caption from the article). Skunk recordings are indicated; skunk species call-outs were added by *The Black Range Naturalist*. The study results affirmed our impression of the most prevalent species. (See *Trailcam Skunks* article, earlier.) However, it should be noted that by selecting for images suitable for publication we had introduced bias into our sample.

The article also includes a graphic (see right) which depicts a point we often make in *The Black Range Naturalist;* there are many reasons the natural history of the Black Range is very diverse. We find ourselves at the margin of the range of many species. The graphic to the left maps the range limits of 35 mammal species. The spaghetti in the middle (where the distribution limits of many species overlap) is the Gila and more specifically the Black Range.

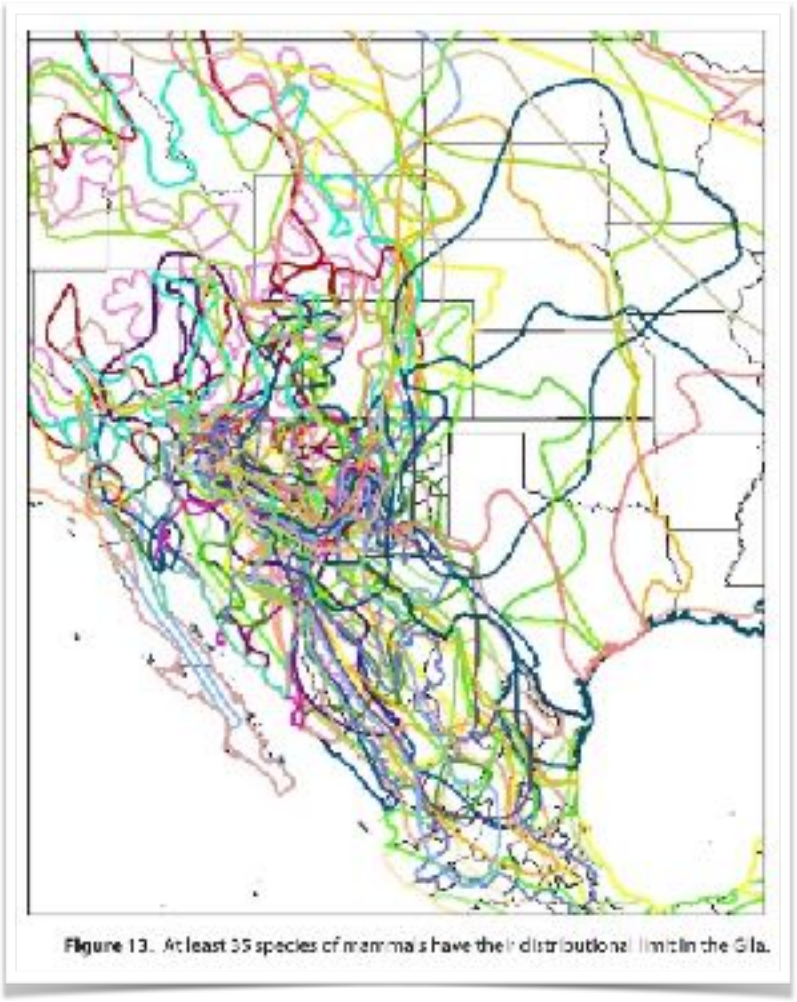


Figure 13. At least 35 species of mammals have their distributional limit in the Gila.

1. Jones, Amanda & Liphardt, Schuyler & Dunnum, Jonathan. (2021). "An overview of the mammals of the Gila region, New Mexico". *Therya*. 12. 213-236. 10.12933/therya-21-1123.

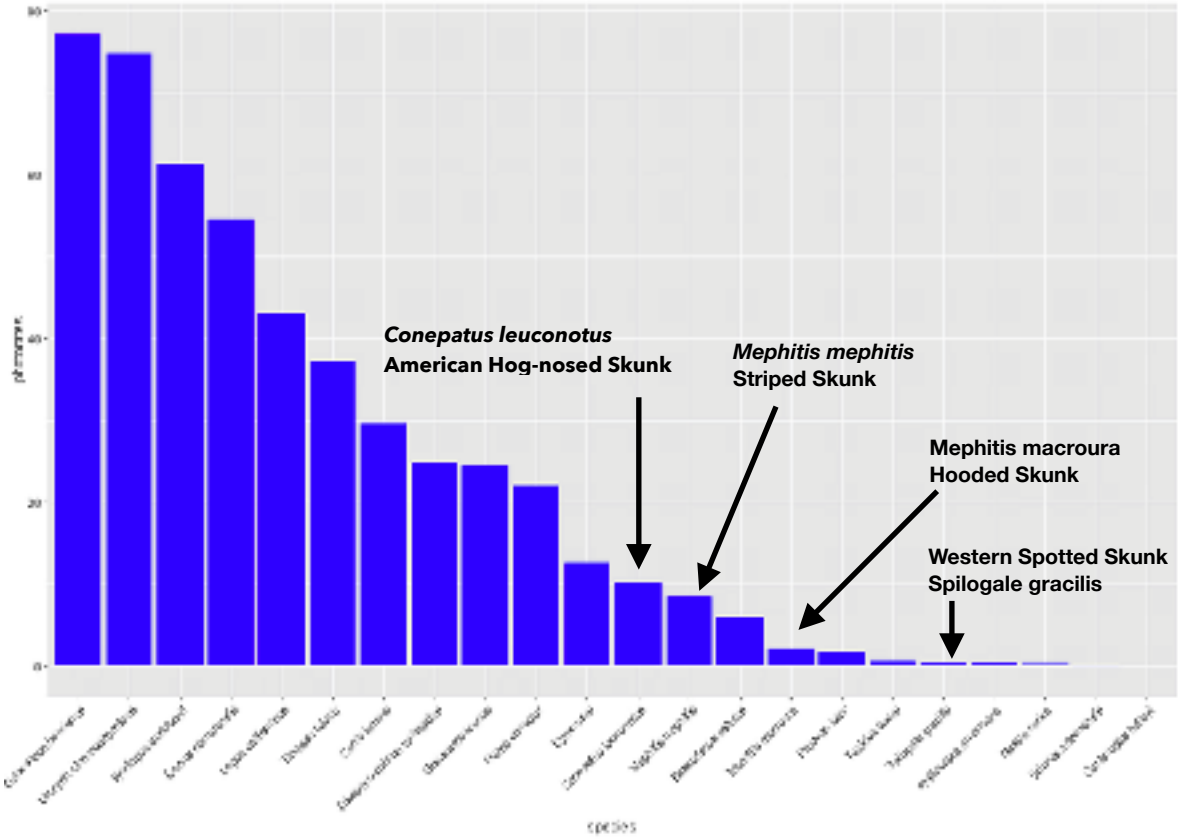


Photo capture rate of large and medium mammal species recorded from 25 cameras covering 100 square km at a density of 1 per 4 square km. A 16-camera grid was established in 2008 and expanded to 25 cameras in 2009. Cameras have been operated continuously since that time, for a total sampling effort of 81,293 camera nights through 2020. Photo rates in the figure are per 1,000 camera nights.

The Historical Introduction, Spread, and Establishment of Old World Mice and Rats in New Mexico and Adjacent Areas

by John P. Hubbard

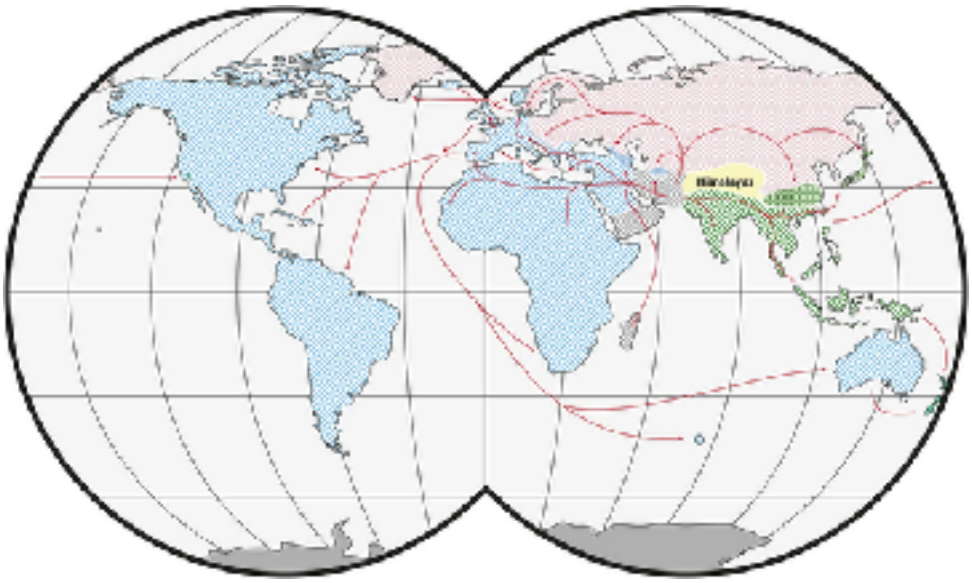
ABSTRACT. - The House Mouse (*Mus musculus*) and Black Rat (*Rattus rattus*) were inadvertently introduced by ships sailing from the European and adjacent regions to North America during the 17th century, while the Norway Rat (*Rattus norvegicus*) likewise arrived on the continent about 1775. Once established in coastal areas of the New World, these three rodent species also dispersed inland and became widespread pests in habitations and agricultural areas; consumers and destroyers of human and other foodstuffs; carriers of disease; competitors with and predators on the indigenous fauna; and otherwise unwelcome inhabitants of altered and in some cases natural landscapes. While the broader aspects of the North American range expansions of these taxa are generally known, their regional progressions have typically not been thoroughly documented there over time. This is certainly the case in New Mexico, where in 1851 Samuel Washington Woodhouse reported the earliest occurrences of the House Mouse and Norway Rat. Although those reports have been widely cited in subsequent works on the mammals of the state, I have found no evidence that they were ever substantiated by museum specimens. Nor does such material appear to have been preserved for certain other reports of the three species in New Mexico, including those of Vernon Bailey and his associates in 1889-1909 during their extensive mammal survey of the state. Given the potential for confusing *Rattus* species with each other, as well as them and *Mus musculus* with native rodents, unsubstantiated records can readily become a source of misinformation concerning the status of these Old World rodents in New Mexico and adjacent areas of North America. Therefore, I have employed specimens to at least initially reconstruct their historic introduction, spread, and establishment there, following which I have selectively utilized information from other reliable sources to further expand our understanding of the later status of these taxa in this region.

This draft manuscript was lightly revised on 2 January 2014 from one that was largely completed on 8 April 2003, and concerning which more current revision I am now requesting any comments that any of its readers might be willing to send me at either my mailing (10 Urraca Lane, Santa Fe, New Mexico 87506) or email addresses (jphubbard@cybermesa.com) - or via telephone at 505-753-6787) Thank you very much. - JPH.

Three species of rodents in the subfamily *Murinae (Mammalia*; family *Muridae*) were inadvertently introduced by Europeans into North America, where all had become established as pests by the late 18th century: the house mouse, *Mus musculus*; Norway rat, *Rattus norvegicus*; and black rat, *R. rattus* (e.g., Hall 1981). All apparently crossed the seas stowed away on ships, then debarked in coastal areas, and later spread as people and their goods moved inland across the continent. While the species' movements doubtlessly coincided with the spread of the colonists and their descendants, published information on that progression is generally limited and little emphasized. This is certainly the case in New Mexico, where all three taxa have become established as self-sustaining populations – although the two Rattus species largely persist as human commensals (e.g., Findley et al. 1975). Given that Europeans first colonized New Mexico in the 17th century, that arrival and subsequent settlement could have led to the establishment of the house mouse and/or black rat in the state. (The Norway rat apparently arrived in North America much later, i.e., about 1775 according to Silver 1927.) However, there seems to be no evidence to support this scenario, such as remains of these rodents in cultural sites or any definitive references to them in archival materials. Instead, the earliest New Mexico records of the three species date from the mid-19th century, after the region had become part of the United States and systematic inventories of the biota had begun – as detailed below.

Woodhouse (1853:48) was the first to report house mice and Norway rats in New Mexico, claiming they were common around human settlements – doubtlessly in 1851 during his traverse of the state along the Rio Grande, San Jose, and Zuni drainages and vicinities. Mearns (1907:362-367) ascribed a similar status to the house mouse during his 1892-1894 survey of the U. S.-Mexican boundary, including in southwestern New Mexico. He also noted Norway and black rats in settlements in Texas, Arizona, and California, although he cited no occurrences from New Mexico. Lastly was Bailey (1931:133-135), who indicated that house mice were numerous and widespread in the state – with records cited for Albuquerque, Aztec, Farmington, Fruitland, Redrock, and San Pedro in the years 1889-1908. In addition, he listed two state occurrences of the Norway rat (i.e., Albuquerque in 1889 and Santa Rosa in 1902), plus one of the black rat at Las Cruces in 1914. Based on these sources, it appears the house mouse was numerous and widespread in New Mexico in 1851-1908, while the Norway rat occurred in settled areas in at least the Rio Grande and Pecos drainages – plus a black rat had been collected in Doña Ana Co. in 1914. However, except in the last instance, these reports apparently lack specimen substantiation, as I have found no material of the species taken during Woodhouse's (1853) 1851 traverse of the state, Mearns' (1907) 1892-1893 border survey there, nor from the localities cited by Bailey (1931) from 1889-1908! Thus, I assume the above information is derived almost entirely from other sources, perhaps including observations and/or animals obtained and discarded without being preserved as specimens. If this is true, then I question the validity of the above status assessment, given the singular importance of specimens for verifying the identities and presence of small mammals. This is especially true when species are difficult to distinguish, which is certainly the case with these taxa. Under the circumstances, I am setting the above assessment aside and will instead focus on specimens in assessing the historic status of these rodents in New Mexico and adjacent areas. (See the acknowledgments section for an explanation of the museum acronyms used here.)

House mouse



Spread of Mus musculus from present day Iran (blue indicates present range of M. m. domesticus. From: Didion and de Villena 2013.

Baird (1857: 443-444) reported the first specimens of this species from what is now New Mexico, including a skin with skull (USNM 1773[= 1733]) taken by Capt. [John] Pope in September 1855 at the "Crossing of the Pecos, N.M." That locality was at the junction of the Pecos River and Delaware Creek (Pope 1854), present Eddy Co., not San Miguel Co. as listed in Findley et al. (1975:269). The second was an unnumbered and undated specimen (skin?) collected by Dr. [C.B.R.] Kennerly at Fort Conrad, Socorro Co., which was active in the years 1851-1854 (Frazer 1963:24-25) and visited by this collector in autumn 1853 (e.g., Cooke in Bailey 1928:19). I have confirmed that USNM 1733 is still in the collection of the Smithsonian Institution, whereas no record now exists for that taken at Fort Conrad (vide C. Ludwig, in litt.). However, I see little reason to doubt the latter's authenticity, given the identification and data were confirmed by Baird (ibid.). Whatever its fate (e.g., the specimen may still exist somewhere in a museum collection), it is the earliest known collection of *Mus musculus* from New Mexico. Another early "New Mexico" specimen is USNM 3185 (skin/skull), collected by D.C. Peters at Fort Massachusetts – which was in what is now Costilla Co., extreme south central Colorado (Frazer 1963:17-19). The specimen is undated, but that installation was active in the years 1852-1858 – after which it was replaced by Fort Garland. In addition, Dr. Peters is known to have been stationed at Fort Massachusetts from 26 October 1854 through 1 October 1856 (Hume 1942:352), during which time this specimen was likely taken. Following these collections, 16-18 years elapsed before the next *Mus musculus* were preserved from New Mexico or immediately adjacent areas. The first were two skins with skulls (USNM 61910 and 61911) taken by H. W. Henshaw (1874:95-96) on 20-22 August 1872 at Apache [=Fort Apache, Apache Co.] in the White Mountains of central-eastern Arizona. Two others (both USNM 12734; fluid specimens) were collected by H. C. Yarrow in July 1874 at San Ildefonso, Santa Fe Co., New Mexico.

The preceding appear to be the first house mice specimens preserved from the southwestern U.S., having been taken at five localities in present New Mexico, Colorado, and Arizona in 1853-1874. At first blush, this material might seem to substantiate Woodhouse's (1853:48) statement that this species was "common about all settlements in...New Mexico [which then included Arizona and southern Colorado]" in 1851. However, these seven specimens were taken over a very large area and a period of more than 20 years, which does not sound "common" to me. Even if others were collected but discarded, one might still expect more to have been retained – because collectors may not have realized they were house mice at the time! In addition, only two specimens were taken at a long-established settlement, that being the Tewa pueblo of San Ildefonso in New Mexico's upper Rio Grande Valley. By contrast, the other five specimens were from four U.S. Army posts or encampments, including a temporary one on the Pecos River – which was occupied for only a matter of months in 1855 (Shumard 1886). While this relationship may be coincidental, on the other hand it could signal a possible connection between the mid-19th-century distribution of this rodent and the U.S. Army in the Southwest! For example, it would not be surprising if house mice accompanied the Army aboard its supply wagons, including in 1846 when New Mexico was seized as part of the U.S.'s war with Mexico. The circumstances would have been straight-forward enough, with these animals having infested loads of provisions that moved westward along the Santa Fe Trail from places like Fort Leavenworth, Kansas (Frazer 1963:35). Of course, *Mus musculus* and/or *Rattus* spp. could have reached New Mexico even earlier aboard wagons following that route from Kansas. Indeed, there had been a significant movement of goods along the Santa Fe Trail since the 1820's, as trade flourished between the U.S. and New Mexico – and areas beyond (Simmons 1996). In any case, it seems likely that at least house mice moved westward in this manner. In addition, they could conceivably have arrived even earlier from the south, when New Mexico was part of a Spanish empire and supplied by wagons traveling along the Camino Real from Mexico.

As noted earlier, I have found no specimens substantiating Bailey's (1931:133-135) records of *Mus musculus* at six New Mexico localities in 1889-1908, i.e., Albuquerque, Bernalillo Co.; Aztec, Farmington, and Fruitland, San Juan Co.; Redrock, Grant Co.; and San Pedro, Santa Fe Co. However, house mice were preserved from elsewhere in the state during that period, including by members of Bailey's Bureau of the Biological Survey. In chronological order these are as follows: USNM 35996 (skin/skull), 23 Sep. 1892, Carlsbad Eddy Co., coll. B.H. Dutcher; USNM 64602 (skin only), 25 Mar. 1894, Las Vegas [San Miguel Co.], L.G. Jameson; USNM 119250-119251 and 129825 (all skins/skulls), 10-12 Sep. 1902, Roswell [Chaves Co.], J.H. Gaut; USNM 130715

(skin/skull), 10 Oct. 1903, E. slope near S. end of the Manzano Mts. [Torrance Co.], J.H. Gaut; and USNM 144996 (skin/skull/skeleton), 1907, Springer [Colfax Co.], M. Keenan. In addition, Mearns (1907:367) listed 16 specimens of this rodent from the 1892-1893 survey of the U.S.-Mexican boundary. Of these, the closest to New Mexico were four (USNM 20084-20085; all skins/skulls)) taken at El Paso [El Paso Co.] Texas on 16-24 Feb. 1892. He also collected earlier specimens in Arizona, including AMNH 2385-2386 (plus one unnumbered [=2384]; skins/skulls) at the U.S. Army post of Fort Verde [Coconino Co.] on 13 Jul. 1884, 21 Sep. 1884, and 22 Oct. 1885, respectively. Interestingly, Coues (1868:133, 137) had been stationed at that locality in 1864-1865, but he did not find the species there. However, he did indicate it had "been imported into the settlements along the Colorado River [of Arizona and California, although it had] as yet hardly penetrated to the interior of the Territory." Thus, while Coues failed to find house mice at Fort Verde, it had reached that installation within 20 years. Notably, by then the railroads were expanding in the southwestern U.S. (Simmons 1996), no doubt facilitating the spread of this species even more than might have wagons!

"Brown or Norway Rat," hand-colored lithograph by John James Audubon and William E. Hitchcock, in John James Audubon and John Bachman, *Quadrupeds of North America*, 1849-54.

The 20th century saw a considerable expansion of house mouse populations in New Mexico, as reflected by specimen collections. For example, Findley et al. (1975:268-269) list 82 specimens from 22 of the state's current 33 counties, of which 47 (from 18 counties) are at MSB. By comparison, a recent printout of MSB holdings lists 150 non-captive specimens from 21 counties, plus I found 21 others and two additional counties to bring the totals to 171 and 23, respectively. Ecologically, Findley et al. indicate the species is widespread "in and around human habitations and in agricultural areas," as well as "commonly in weedy grasslands, disturbed roadside communities, and also in better developed grasslands." However, they indicated it had not been found in "well-developed woodland or above," including grasslands such as those on "the San Augustin Plains [Socorro and Catron Cos.], the North Plains [Cibola Co.], or the Chaco Basin [San Juan and McKinley Cos.]." While most MSB specimens conform to this characterization, a few are from areas above 6000 ft. and/or more closed habitats. For example, the earliest specimen in that collection (MSB 15100) is a skull taken on 2 March 1915 by J.S. Ligon 10 miles NE of Reserve, Catron Co. That places the locality near Cruzville, a thinly settled area in riparian habitats surrounded by evergreen woodlands and forests. Other records of this type are from Canjilon, San Juan Mountains, Rio Arriba Co.; Jemez Springs vicinity, Jemez Mountains, Sandoval Co.; Glorieta, Sangre de Cristo Mountains, Santa Fe Co.; Fort Wingate, Zuni Mountains, McKinley Co.; Cedar Crest area, Sandia Mountains, Bernalillo Co., and Elk Canyon, Sacramento Mountains, Otero Co.

Norway rat

I have not located any 19th or early 20th-century specimens of Norway rat from New Mexico, including in the years 1889 and 1902 – when Bailey (1931:133) reported the rodents at Albuquerque, Bernalillo Co., and Santa Rosa, Guadalupe Co., respectively. Furthermore, Baird (1857: 438-439) did not list the species (which he called *Mus decumanus*) from the state or elsewhere in interior North America, although he did cite specimens from the Atlantic, Gulf, and Pacific coasts – including Mississippi, California, Oregon, and Washington. In fact, the earliest southwestern specimens appear to be from the U.S.-Mexican boundary survey of 1892-1894, including one (USNM 58846; skin/skull) taken by F. X. Holzner on 9 November 1893 at Fort Lowell, Pima Co., Arizona (Mearns 1907:365). The other two (USNM 83464 and 83465; skulls only) were not cited by Mearns, but the catalog entry indicates they were taken at Palomas Lakes, Chihuahua on 1 May 1892 (vide C. Ludwig and M. Carleton, in litt.). In his field notes, Mearns wrote "white rat[s], Palomas, Mexico, skins given to Stephen Barlow, no measurements." The Fort Lowell specimen is also of the white (or albino) form, which Mearns (op. cit.:364-365) reported as being notably more common than brown animals in towns such as El Paso, Texas and in Nogales and Tucson, Arizona. In fact, he referred to white rats as the "domestic variety," which may indicate that humans purposely brought them into the region – as opposed their having arrived as unwelcome

Edgar Alexander Mearns, 1900

stowaways, as wild (brown) types presumably did. The only other Norway rat specimens listed by Mearns were from San Diego, California, where he took a series of nine in the period 5-20 May 1896. Elsewhere, contemporary USNM specimens include one from Denver, Colorado (1885) and 12 from Eagle Pass, Roma, and Brownsville in the Rio Grande Valley of Texas (1890-1891) – C. Ludwig (in litt.).

Samuel Washington Woodhouse, 1847

In the light of the preceding, I cannot accept Woodhouse's (1853:48) assertion that Norway rats were "found throughout all the settlements [of New Mexico and adjacent areas in 1851] wherever there were white settlers." In fact, my doubts would remain even if Woodhouse erred in his identification, meaning this status might instead be applied to the black rat. On the other hand, I believe this is exactly what happened with Coues (1868:133, 136), namely when he indicated that "*Mus*

Elliott Coues, 1900

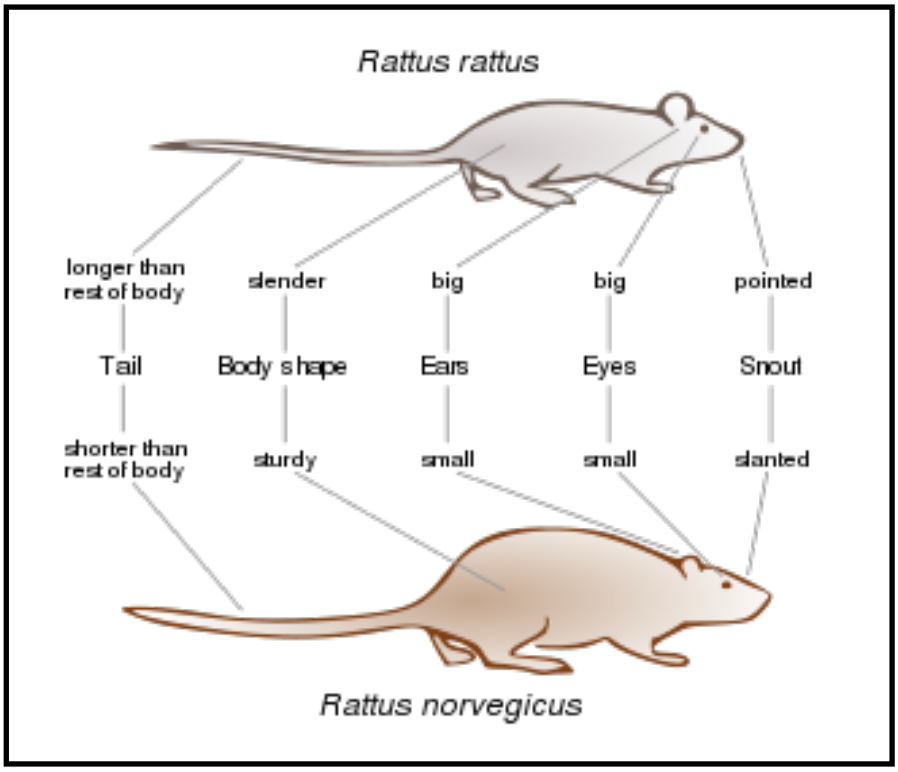
decumanus" had reached settlements along the Colorado Valley of Arizona and California. On the contrary, based on specimens from Arizona and adjacent areas, I suspect the animals in question were actually *Rattus rattus* (see below). In fact, Hoffmeister (1986:451) listed only two specimens of *R. norvegicus* from that state, one from Fort Lowell in 1893 (see above) and a second that he took at Grand Canyon Village, [Yavapai Co.] on 3 November 1958. The latter was piebald in color and was thought to be an escaped pet. In New Mexico, the first specimen (NMSUB 15379; skin only) of the species was collected by S.E. Aldous (no. 124) at Albuquerque, [Bernalillo Co.] on 16 January 1930. In 1939, two more were preserved from the west bank of the Rio Grande, Bernalillo Co. – presumably in the Albuquerque area: MSB 49, collected on 29 January by R. T. Fincke; and MSB 6, 31 March, S. Bowman. Next was MVZ 106778, taken on 24 August 1946 at Pajarito, Bernalillo Co., by J. J. Bordenare; then MSB 64591, 20 January 1952, same county, 1 mile S of the Alameda bridge by R. D. Ivey. Subsequently, seven additional specimens have been preserved from Bernalillo Co., four from the 1960's, two 1990's, and one undated. In total, there are 13 MSB specimens of this species from the state for the period 1939-1996, all taken in Bernalillo Co. in the Albuquerque area.

Of course, specimens do not tell the whole story as regards the New Mexico status of this or the following species of *Rattus*. Indeed, the two are clearly under-represented in terms of state specimens, no doubt due their being introduced rodents that often live as human commensals. In addition, some people may have an aversion to preparing the animals as specimens, which is understandable given their often uninviting habitats, habits, and related factors. However, specimens remain the best means for verifying the identification and occurrence of these two species, and hopefully material will continued to be collected to substantiate their status in New Mexico. Meanwhile, an alternative source of information is the study of Miller and Doll (1967), who detailed the status of *Rattus* spp. based on surveys carried out by the New Mexico Department of Public Health in the period 1951-1965. That work was conducted essentially statewide, and it included checking for sign, sight records, and trapping of these and other rodents. However, if any specimens were preserved, I am not aware of them or where they might have been deposited. In terms of findings, these authors report Norway rats from 27 of the state's then 32 counties, with records lacking only from Catron, Grant, Los Alamos, Rio Arriba, and Taos counties. The species was apparently most numerous in agricultural counties along the border with the Texas Panhandle and in the middle and lower reaches of the Rio Grande and Pecos valleys. In addition, localized populations were found elsewhere, including the San Juan Valley, Rio San Jose corridor and west to Gallup, McKinley Co., Magdalena, Socorro Co. (in 1953, but later died out), Lordsburg, Hidalgo Co., Deming, Luna Co., and Alamogordo-Tularosa, Otero Co. Habitats occupied in the state were said to be "farms...rural villages...cities and towns" below 7000 feet, with mountains and "lightly [human-] populated semi-desert" viewed as barriers to the species' further spread in the state.

Black rat

As noted earlier, Bailey (1931:134) cited New Mexico's first specimen (NMSUB 74; skin only) of this species (which he called *Rattus alexandrinus*) as collected by A.A. Archer at Las Cruces, Doña Ana Co., in October 1914. I have examined that specimen, which is clearly a *Rattus* but with no tail, standard measurements, or skull. While it may indeed be an example of *R. rattus*, its pelage coloration is more suggestive of *R. norvegicus*. Under the circumstances, I consider it a *Rattus* of unknown species, although its identity might ultimately be resolvable by genetic or other analysis. In 1920, W. Huber spent several months collecting mammal and other specimens in Doña Ana Co., among which were three *R. rattus* (MCZ 18704-18706) taken 3 mi W of Las Cruces on 14 August (M. Rutzmoser, in litt.). The species was next verified in that county in 1964, when J. Burns took a specimen (NMSUB 1974; skin only) 1 mile N of Mesilla Dam and 0.5 mi E of the Rio Grande on 10 May. Since then I have located 18 additional specimens (NMSUB, NMSUW, OU, USNM) from Doña Ana Co., all from the Las Cruces area in the years 1966 -1992 – including a series taken by T. L. Best at the A. B. Cox Ranch in 1967.

Besides the preceding, I have also located several other New Mexico specimens that have been incorrectly or questionably attributed to *Rattus rattus*. These include three that are actually assignable to *R. norvegicus*: NMSUB 4995 (skin and skull) taken by P.W. McCasland on 24 October 1973, 2.5 miles E of Eunice, Lea Co.; and MSB 34278-34279 (fluid preparations) collected by the Environmental Improvement Agency on 30 August 1973, Albuquerque, Bernalillo Co. In addition, two skulls (MSB 34594-34595) of this species have suspect data, having allegedly been taken in the Jemez Mountains, Sandoval(?) Co. These have no date, collector, or standard measurements, although they were probably catalogued about 1974. Finally is MSB 88997 (skin/skull/skeleton), taken by the Environmental Health Department (and prepared by P. Case) in Albuquerque on 28 June 1996, but which I am unable to locate. In fact, it was initially catalogued into the tissue collection (as NK 43077) as a *R. norvegicus*, with the standard measurements of 426-200-42-21 mm; 230 g. The latter indicate the tail in this specimen is considerably shorter than body length, which is consistent with its being *R. norvegicus* rather than *R. rattus*. Notably, Miller and Doll (1967) reported *R. rattus* in New Mexico only in Doña Ana Co., with their earliest record near Anapra in 1954. Subsequently, they found the species northward along the Rio Grande Valley another 60 miles to the village of Doña Ana. Although they reported that this species coexisted with *R. norvegicus*, I have seen no wild-taken specimen(s) of the latter from Doña Ana Co. Baird (1857:439-443) listed no specimens of the black rat (treated both as *Mus rattus* and *M. tectorum*) from New Mexico or adjacent states, but he did cite USNM material from Humboldt Bay and San Diego, California and Cadercita, Nuevo Leon. By 1890, other USNM holdings (vide C. Ludwig and M. Carleton, in litt.) indicate the species had certainly reached Arizona, where H. Brown and P. L. Jouy took specimens at Tucson in November and December. Mearns (1907:365-366) listed only one specimen (as *M. alexandrinus*) from the 1892-1894 U.S.-Mexican boundary survey, that from Nogales, Arizona in July 1893. He also indicated that Brown had found *M. rattus* at Yuma, Arizona by 1900, which agrees with Palmer's collection of two along the Colorado River in that state – presumably in the late 1800's. In addition, specimens were taken at Fort Huachuca, Cochise Co., Arizona in 1892, one on 5 May by A. K. Fisher and two on an unspecified date by T. E. Wilcox. In this regard, Hoffmeister (1986:451) quoted Fisher as saying this species "was common about the hospital and granary" there at the time. However, Hoffmeister indicates that only three Arizona specimens have been preserved since then, one from Miami, Pima Co. and two from Bisbee, Cochise Co. In fact, Hoffmeister (op. cit.: 449) and his colleagues never encountered *R. rattus* in their extensive mammal work in that state, leading him to suggest that both it and *R. norvegicus* may have died out there.



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Discussion

Woodhouse (1853:48) would have us believe that the house mouse, and by implication the Norway rat, was "common about all settlements in the Indian Territory [= Oklahoma], Texas, New Mexico, and California" during his visits to these areas in 1849-1852. In fact, that claim has been uncritically

based on the above and other information. I have found no evidence that the house mouse, Norway rat, and/or black rat arrived in the southwestern U.S. and vicinity during the early European (Spanish) colonization and occupancy of the region. Instead, the house mouse probably arrived with the U.S. Army in the 1850s, although that process could have begun with travelers along the Santa Fe Trail beginning in the 1820s. However, regional populations of this species appear to have remained small and localized into the 1880s, after which they expanded markedly. That expansion coincided with the arrival and spread of the railroads in the Southwest (Simmons 1996), which also marks the first regional appearances of black and Norway rats. Prior to that time, the nearest populations of these two species were mainly in coastal areas, including along the Gulf of Mexico and Pacific Ocean as early as the 1850s (Baird 1857). While the black rat may have reached the Southwest and spread largely on its own, the Norway rat's arrival may have been initially aided and abetted by humans. For example, not only did Mearns (1907:364-365) collect white specimens of the species in Chihuahua and Arizona, he reported those in San Diego, California may "have been recently imported from China." He further indicated the species was "very abundant" in that port city, and comprised of "black, white, or more often, particolored" animals. I am unsure as to the purposes of this alleged importation, but conceivably such rats might have been kept as pets or even for food.

Acknowledgments

First, I wish to acknowledge and thank the staffs of various collections from which I obtained North American specimen records and other information on *Mus musculus, Rattus norvegicus*, and *R. rattus,* including Ned S. Gilmore and Nate Rice of the Academy of Natural Sciences of Philadelphia (ANSP); Guy G. Musser of the American Museum of Natural History (AMNH); Maria Rutzmoser of Harvard University's Museum of Comparative Zoology (MCZ); Jeff Brown and Peter Houde of New Mexico State University Department of Biology (NMSUB); Raul Valdez of New Mexico State University Department of Wildlife and Fishery Sciences (NMSUW); William L. Gannon of the University of New Mexico Museum of Southwestern Biology (MSB); Janet K. Braun of the University of Oklahoma Sam Noble Oklahoma Museum of Natural History (OU); and Craig Ludwig and Michael Carleton of the U.S. National Museum of Natural History (USNM). In addition, I also thank Ellen Nora Cavanaugh, Robert W. Dickerman, Arthur H. Harris, Bruce J. Hayward, D. Archibald McCallum, Paul J. Polechla, and Luis Ruedas for their contributions to this study.

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Trail Maintenance Update

The Gila Back Country Horsemen continue their efforts to ensure our access to the Black Range, as shown in the photos from the East Railroad Canyon Trail (top and center) and Upper Gallinas Canyon Trail (bottom). Photographs by Melissa Green from May 2021.

New Offerings From the Black Range Website

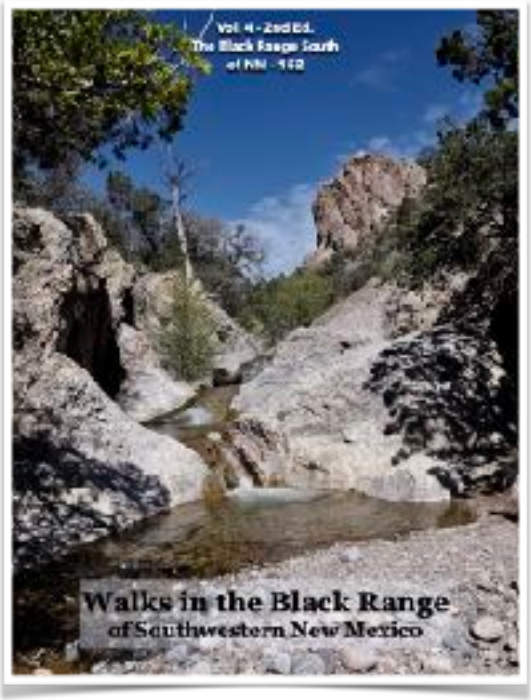
The last volume of the 2nd edition of *Walks In the Black Range* was issue at the first of July 2021. In all, the four volumes of this series cover 75 hikes, with trail and natural history information about each.

So, what now?

We are considering reviving our "Natural History of (insert trail name)" series in this magazine. We stopped the series so that we would not have to much redundancy between the *Black Range Naturalist* and the *Walks in the Black Range*. Now that the 2nd edition is "in the can" we can look to the future and consider what we do next.

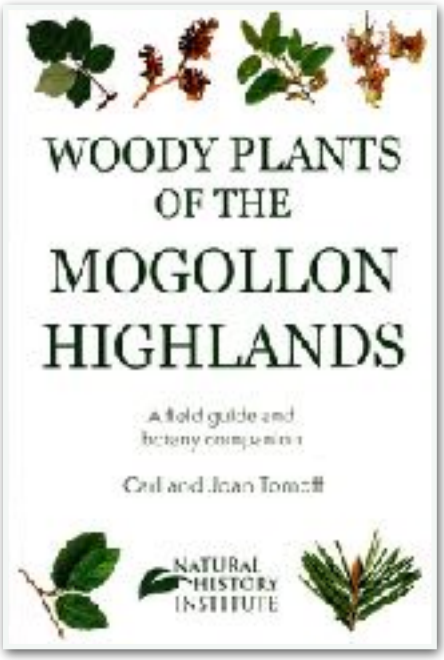
We would like to continue the natural history of specific trails series in the *Black Range Naturalist*. We do not wish to repeat trails covered in the 2nd edition.

If you have done a walk not covered in the *Walks in the Black Range* and would be interested in doing an article about it and its natural history, please let me know at rabarnes@blackrange.org.



Tomoff's *Woody Plants of the Mogollon Highlands*

Writing a review of a new field guide on any natural history subject is difficult. Field guides aren't something you sit down and read. You use them to help you identify plants, animals, rocks, etc. in the wild. They're hard to evaluate until you've used them for a while. That said, perhaps we can consider what follows to be an announcement of a book designed to help students and amateur naturalists identify plants within a particular region of the American Southwest – a region given its distinct title only within the past quarter century or so.



As noted by the authors, the Mogollon Highlands are ecologically where Mexico meets Canada. Vegetation of the Rocky Mountains, the Madrean terrains of Mexico, the Great Basin desert to the north, the Mojave to the west, and the Sonoran and Chihuahuan deserts to the south meet here. The outcome is a landscape filled with an amazing diversity of plants and wildlife. This book is a brief, but enlightening, introduction to the ecological characteristics of the region.

The book is well illustrated, providing basic botanical and ecological terminology to aid the use in its application. The drawings supporting the basic botanical knowledge are clear and attractively done. In a sense the book is a clearly written review of basic botany, a brief introduction to local plant ecology, and a well-illustrated treatise on woody plants one might expect in the various plant communities within the Highlands. As such, it will be useful to people wanting to learn the dominant plants that exist from Kingman, Arizona to Truth or Consequences, New Mexico, including a goodly chunk of the Gila Wilderness.

One particularly interesting feature is the etymology given for the various species binomials. The book makes no claim at being inclusive, but it will certainly be useful in identifying many of the most common and conspicuous plants in the Black Range. My quick count in the index came up with 86 species.

- Harley Shaw, Hillsboro, NM
September 2021

Follow-Ups

Coati: July 2021

Adding to our documentation of the White-nosed Coati, *Nasua narica*, in the Black Range, Larry Cosper has provided video (see framegrab from the video below) of an individual in Hillsboro on February 13, 2018.

Jim Laupan reports seeing Coati at the first of the new bridges going west from Hillsboro, in July of this year.

Coatimundi: The name "Coati" or "Coatimundi" is Tupian Indian in origin. Some sources use the names interchangeably. But, at least in Belize, "Coatimundi" refers only to male Coatis, especially during the non-breeding season when they are not associated with female and young groupings.

Ponderosa Pine Forests: July 2021

Roger Peterson (Santa Fe) notes that sticky Dwarf Mistletoe seeds are dispersed ("shot") roughly 10 meters when they mature. A substantial distance for such a small seed. The seeds are shot out when turgor pressure builds up within the berry (USDA photo below). Their initial velocity is about 24 meters per second. Dwarf Mistletoe plants are generally found grouped closely together.

Additional Resource: "Mistletoes: Pathology, Systematics, Ecology, and Management", *Plant Disease*, July 2008, Mathiasen, Nickrent, Shaw, and Watson.

Our Covers

The Long-nosed Leopard Lizard, *Gambelia wislizenii* (Baird and Girard, 1852) which graces our front cover was photographed near Cooke's Spring. The family, *Crotaphytidae*, of which it is a member, is found in the western United States (as far east as Missouri) and northern Mexico.

The Long-nosed Leopard Lizard is an active hunter during the day (March to October) and can leap as much as two feet to capture prey. The sex of the individual on the cover is not known, but the one shown above, photographed in Frying Pan Canyon, is a female. The orange spots seen on this lizard appear on female lizards of this species during breeding season.

The Texas Horned Lizard, *Phrynosoma cornutum* (Harlan, 1825) pictured on our back cover, and at the right, was photographed in Hillsboro. This species has a range which extends from the northern Mexican states to Kansas in the north and from southeastern Arizona to the Gulf Coast of Texas. The January 2019 issue of this magazine included an excellent article by Randy Gray on the Horned Lizards of this area.

Our Index

With this issue we complete our fourth year of publication. We have published a wealth of material and call your attention to the index of this material on the Black Range Website (www.blackrange.org).

Please join us during a few more years by providing articles, photographs, or information you believe we should share with those interested in the Black Range. (rabarnes@blackrange.org)

Published in Hillsboro, New Mexico