

**OBSERVATIONS AND ECOLOGICAL EVALUATIONS OF WILD HORSE & WILD BURRO HERDS & HERD AREAS & RELATED IN AZ & NV 2018. COMPLEMENTING EARLIER REPORT (4/2018). WITH PHOTOS**

By Craig C. Downer, Wildlife Ecologist,  
Wild Horse & Burro Fund/Andean Tapir Fund, P.O. Box 456, Minden, NV 89423. [ccdowner@aol.com](mailto:ccdowner@aol.com).

Date of Report: July 26, 2018



*Wildlife Ecologist & author of this report: Craig C. Downer in Kingman AZ. April 2018. Copyright by Craig C. Downer*

**TABLE OF CONTENTS:**

| <u>Page Number</u> | <u>Description</u>  |
|--------------------|---|
| 1                  | Title page + Photo of Author: Craig C. Downer   |
| 3                  | Prelude + photo: Cerbat Mustang band  |
| 4                  | Pilot Mountain Wild Horse HMA, Nevada BLM. Field Trip observations  |
| 7                  | Blythe Giant Horse Figure & onto Arizona  |
| 8                  | Photo: Blythe Giant Horse Intaglio  |
| 11                 | Ecological Evaluations of HMAs by Transects with Graphs & additional observations<br>+ Photo of Wild Burros of Cibola-Trigo HMA |
| 12                 | Cibola-Trigo WH & WB HMA – begin transect descriptions  |
| 12                 | Photo of 3 Desert Mule Deer in wash, Cibola-Trigo HMA   |
| 13                 | Photo of Handsome Wild Burro group in desert. C-T HMA   |

- 14 Photo close-up of wild burro near Hart Mine, C-T HMA
- 15 Photo of Palo Verde tree in blossom with bees. C-T HMA
- 16 Photo of Creosote tree in blossom. C-T HMA
- 17 Photo of Illegal Removal of Mesquite tree. C-T HMA
- 17-27 Transect Results Descriptions
- 27-28 Graphs of Transect Results for Ratings of Ecological Attributes. Cibola-Trigo HMA
- 29 Havasu Wild Burro HMA + photo of rugged peak
- 30 Photo of Crashed Fighter Jet near Lake Havasu City + Sole Transect description. H HMA
- 31 Black Mountain Wild Burro HMA begin + photo of healthy desert west of Oatman, AZ
- 32 Three Transect descriptions for B.M. HMA. + Photo of B.M. HMA wild burro in draw
- 35 Cerbat Mountain Wild Horse HMA, BLM Kingman AZ. Begin + photo wild mustangs
- 36 Photo Beavertail Cactus in blossom. Cerbat Mtn. HMA
- 37 Photo Spectacular Rocky Hill Scene with blossoming cactus, Cerbat Mtn. HMA
- 38 Photo Young Grullo Cerbat Mustang in desert
- 39 Photo same mustang as above but silhouetted on ridge against sky
- 40 Photo Alert Cerbat Mustang Pair w/ Cerbat Mtn. in background
- 41 Photo Water pipe draining higher mountain spring. Cerbat Mtn. HMA
- 42 Photo of Rancher's Red Bull in Cerbat Mtn. HMA
- 43 Photo of ancient Bighorn petroglyph near Cerbat Mtn. HMA
- 44 Photo of colorful Mural by Roy Purcell on boulders near Chloride AZ
- 45 Photo plentiful grass & forage for wild horses but in fenced out part of Cerbat HMA
- 46 Photo of Pinkish-Purple Rattlesnake near west side Cerbat Mtn. HMA
- 47 Photo several cattle grazing near west side Cerbat Mtn. HMA
- 48 Photo heavily damaged ecosystem by cattle, vehicles. Near west side Cerbat Mtn. HMA
- 49 Photo of cattle guard w/o rebar. Cerbat Mtn. Ridge in HMA
- 50 Photo of barbed wire fence on Cerbat Mtn. ridgetop restrict. wild horses. Cerbat HMA
- 51 Photo of Healthy Pinyon Pines east of Cerbat Ridge. Cerbat HMA
- 52 Photo Open Pit Mine west side Cerbat Mtn, near HMA, hazardous in many ways
- 52-65 Cerbat Mtn. HMA, 17 ecological transects descriptions
- 65 Photo "Dust Tornado" near north end Cerbat HMA, Red Lakes area
- 66-67 Graphs of Cerbat Mtn. HMA Transect results for 3 Ecological Attributes
- 67 Continued notes going on from Red Lake to visit Grand Wash Joshua Tree ACEC
- 68 Observations of Wheeler Pass WH & WB JMA + photo of clear water pool of Cold Creek
- 69 Photo lone bay mustang in desert below Cold Creek. Wheeler Pass JMA + photo of
- 69 white mustang with band of fellow mustangs amid Joshua Trees. Wheeler Pass JMA
- 70 Photo of fences restricting access of wild horses to Willow Spring. Wheeler Pass JMA
- 71 Photo of Bull Elk with rack near Cold Creek. Wheeler Pass JMA
- 72 Photo of dark mustang with vast desert panorama. East side Wheeler Pass JMA
- 73 Photo of 3 ladies who defend wild horses & burros of Wheeler Pass JMA
- 74 Photo of band of stalwart mustangs w/ Joshua Trees & Bonanza Peak. Wheeler JMA
- 75 Photo of striking paint mustangs with Cold Creek in background. Wheeler Pass JMA
- 80 Photo of commanding view from near Bonanza Spring over Cold Creek. Wheeler JMA
- 83 Photo of Wild Horse & Burro Cold Creekian couple guiding author. Wheeler Pass JMA
- 86 Photo of proud & free dark brown mustang below Cold Creek. Wheeler Pass JMA



*Band of spirited Spanish mustangs, eastern Cerbat Mountain HMA Arizona. April 2018. Copyright by Craig C. Downer*

## **PRELUDE**

In recent years, I have visited over thirty wild horse & burro herds & their habitats, several of which have been the subject of my ecological evaluations, reserve design recommendations, detailed descriptions & reports. Twenty three of these were covered in my earlier report (4/2018) in which I promised a complementary report giving additional descriptions & the results of my ecological evaluation transects. These two reports reveal a situation in our nation today that is in urgent need of corrective attention, & they concern the four states of Arizona, California, Nevada & Oregon. If remedial actions are not soon taken, I predict these herds & their legal habitats will continue to decline & be at grave risk of die-out & takeover by monopolizing interests. This would be the perverse fulfillment of the most extreme pipedreams of the wild horses' & burros' dedicated enemies! Those of us who appreciate, care for & defend these wonderful, restored-North-American natives & their graceful natural place in our shared home world must not allow this to happen! Such a dismal fate would be the final betrayal of the unanimously passed Wild Free-Roaming Horses & Burros Act of 1971 (WFHBA) & of all those kind, noble & valiant souls who have devoted so much of their lives to seeing this law passed & implemented. --But most of all, this lackluster future scenario would betray the horses & burros themselves. These unique & longstanding presences upon Earth – these highly evolved beings – are ancient yet ever young & selfrenewing. They have done so much for us humans, having made possible so much of our current level of comforts & capacity, yet, their greater place & realization lies in the free & balanced world of Nature from which they arose over the course of millions of years. For this & numerous related reasons,

isn't it high time that we humans do something truly good for them by allowing them to live in natural freedom & preserve their long-term survival vigor? This is the real purpose of the WFHBA.

My earlier report described my visits to & evaluations of both wild horse & burro herds & their legal herd areas/herd management areas (BLM) & territories (US Forest Service) & summarized what can best be termed the unfairness issue. Though the field evaluations in this earlier report took place mainly in 2018, these involved earlier years as well as 2019. In fact, these coupled reports resuscitate observations & experiences dating back to my earliest experiences with the wild horses & burros & their natural homes. These reports give insights into how the wild horses & wild burros are faring, both health- & habitat-wise & in other ways, including politically. They reveal to what degree these naturally living horses & burros are being persecuted, including through unfair allocation of resources & the unjust assignment by government officials of mere token population levels that are genetically nonviable (see earlier report). The current predicament involves many factors; those I have put my finger on are alarming. But knowledge is power & it is my hope that this report can spur the rapid correction of this extremely unjust, in fact intolerable, situation. Rather than further reduced, America's wild horses & wild burros along with their appropriate habitats need to be restored in order to assure their long-term well-being, their future survival. They are a priceless heritage & deserve respect in their own right.

We start with a day field trip (11/16/2018) to the Pilot Mountain Wild Horse HMA in central Nevada where we will learn much about the politics of wild horse conservation, or the lack of such. Then we will continue with a few-week expedition that starts with the mysterious Blythe Giant Figures on the CA-AZ border. After this amazing site, we strike east to Quartzite, AZ, then south to enter the vast Cibola-Trigo Wild Horse & Burro HMA near Yuma & just north of Mexico. Here we shall perform 15 ecological transects & explore around while camping out, before proceeding north to Arizona's Havasu & Black Mountain HMAs inhabited by wise & fascinating burros & Cerbat Mountain HMA inhabited by exciting Spanish mustangs. Finally in Nevada, we visit the Wheeler Pass Joint Management Area (BLM & USFS) in the fabulous Spring Mountain area, inhabited by both horses & burros. Here we shall meet the admirable Cold Creekians who intelligently observe, generously care for & valiantly defend the unique & valuable wild horses & burros in this majestic place.

#### **PILOT MOUNTAIN WH HMA (CARSON CITY NV BLM):**

The Carson City BLM office began their Scoping Process for a 10-year management plan with a field trip on Friday, Nov. 16, 2018. Public Affairs Officer Lisa Ross had thoughtfully invited me & accompanied the tour, as did the Carson City District Manager Ken Collum, Wild Horse & Burro Specialist John Axtell & several other BLM Range Conservationists & other specialists. Also present was Dr. Jim Limbaugh, a UNR Natural Resource academic; Ron Kyle, a retired USFS official; Willie Mollini, the retired Director of the Nevada Department of Wildlife (NDOW) for many years, along with several biologists, wildlife & land managers from both the BLM & NDOW. Departing at 5:30 AM, our caravan of several vehicles travels first east on US Highway 50 then south on US 95. We first pass through the military town of Hawthorne then proceed SE to enter the BLM grazing allotment of Mr. David Holmgren, who awaits us along with another rancher & various family & friends. We all meet at the western edge of his allotment when we arrive mid-morning.

As we passed by Walker Lake, Mr. Mollini indicated that nearly all this lake's fish had recently died due to this large inland lake's increased saltiness. This has enormously impacted many species of migratory

birds, since the lake is a major migratory stopover for loons, white pelicans, diverse ducks & geese as well as myriad shorebirds. Much of this tragedy has been caused by ranchers upstream along the Walker River & their failing to share water during years of low precipitation. So much of this deplorable situation relates to their obstinately lavish & wasteful irrigation practices, e.g. sprinkler rather than drip irrigation of alfalfa fields, etc. Also the degradation of water-absorbing soils & animal-sustaining vegetation in surrounding mountain ranges such as the Sierra Nevada, the Pine Nut & the Sweetwater is another major factor. As we observed, overgrazing & over-trampling by livestock are major culprits here; much of this situation is linked to Global Warming/Climate Change & to the pollution of the Earth's atmosphere & the destruction of its ecosystems by an exploding human population. The explosion of human numbers accelerates the exploitation of the natural world, which is too often viewed as merely a "natural resource" &, as such, merely a target to take advantage. Instead, we should perceive & conceive the natural world as a complex of vitally interrelated phenomena that should be appreciated in its own right. All components of the natural world should be viewed together as an outgrowth of the millions of years it has taken to establish Earth's complex, interrelated life community, including us humans. This should be respected & cherished within its greater context ... but I digress.

At the southern end of Walker Lake just before Hawthorne, we spy several mustang bands grazing amid well-watered meadows. As part of the Pilot Mountain wild horse herd, their presence here is owing to a vigorous defense by wild horse advocates, including Respect for Horses, Nevada Horsepower, nearby Schurz Indian Reservation, the town of Hawthorne, the Army Base in Hawthorne & other entities including filmmaker Carl Mrozek & myself. We appreciate them for their beauty & spirit, as a tourist attraction & as ecosystem restorers & wildfire preventers. Regarding this special yet vulnerable herd, it should be recognized that the Carson City BLM office planned to totally remove these wild horses, naming accident hazard on U.S. Highway 95 as its principle reason. Yet, all it took was the construction of a strong, now-accomplished fence on the western edge of the HMA to prevent this hazard. Rather than west, however, these horses usually migrate east into the Gillis Range, the Gabbs Valley Range & south into Pilot Mountain. However, due to increased persecution in recent years, they are not frequenting these ranges as much as they should be. In fact, during our field trip, we encountered neither wild horses nor their spoor, e.g. tracks, trails, rubbing posts with shed fur, wallows or droppings. In their place were many wiry, free-ranging cattle that belonged to rancher David Holmgren. We estimated approximately 300 wild horses among the marshes, which is this historic herd's largest remaining segment.

As earlier indicated, at the entrance into Pilot Mountain, we met with rancher Holmgren & his entourage. Around 30 of us gathered into a big circle to discuss the ecological & land management situation at hand. GPS was: 38.54296 deg. N; 118.25249 deg. W; 4,583' elev.; the weather was clear & sunny yet cold, a bit above freezing. Holmgren & another younger rancher, Phillip Shallenberger, were up for a 10-year livestock grazing renewal & sought to continue their near monopoly on these public lands. BLM officials revealed that the resources from 50 acres here were sufficient for one Animal Unit Month (AUM), i.e. for the survival of one cow & her calf for one month. For this the BLM collects (sometimes) the mere token fee of \$1.35 (present & minimal legal fee under the Taylor Grazing Act). Three mountain ranges to the west, the Pine Grove, Wassuk & lofty Sierra Nevada, put this area in an extreme "rain shadow" as concerns winds & moisture-bearing storms that blow in from the west & the Pacific Ocean. I was surprised by the claim that here it would take only 50 acres to support a cow & her

calf, especially when I consider the hundreds & even thousands of acres BLM assigns for the survival of a single individual wild horse or wild burro. (Compare figures from my earlier April report.)

A tall power line crossed our place of meeting, where twelve wiry cattle grazed amid sagebrush & salt brush. It was apparent from their thin condition that they were really struggling to survive & that little in the way of nutritional forage remained over this vast area that they had not already eaten. Holmgren grazes his cattle year-round with no off-season to allow this arid ecosystem to recover. It was obvious that the range condition trend was in steep decline.

The springs we visited had been terribly degraded by cattle; many of these were present in the upper Paymaster Canyon. Cornelius Spring was professionally evaluated as “Functional at Risk” with “Downward Trend;” and the Warner Corral was evaluated as just plain “Non-Functional”. The grazing allocation for Holmgren is ca. 1,000 year-round cattle, & these were causing a severe degradation of vegetation & soils. Certain thistles were starting to invade areas where the vegetation had been denuded; the notorious Cheatgrass (*Bromus tectorum*) was even more prevalent.

At Cornelius Spring, we were shown a fenced-off enclosure to grazing of several square meters. This graphically revealed the destructive impacts that cattle were causing. Within the wire enclosure grew profuse stands of Indian Ricegrass as well as various palatable grasses like Bluebunch Wheatgrass. Holmgren objected to these monitoring fences, claiming loudly that they were “unnatural” & that if the BLM fenced off the entire spring they would have to pay him for what he lost in terms of cattle forage, etc. Also growing here were Big Sagebrush & Four-Winged Saltbush. Some of the range experts informed us that the latter is an excellent protein source for herbivores. Spiny Hopsage was also observed; I could see that it was benefiting several species of vertebrates as well as invertebrates.

When I asked if the Holmgren grazing allotment was part of the Pilot Mountain WH HMA, WH & WB Specialist John Axtell indicated in the affirmative. However, he offered no reasons as to just why all the areas we visited this day, with the exception of the southern meadows of Walker Lake, had no wild horses nor any recent sign of them. Mr. Axtell as well as the younger rancher Shallenberger did indicate, however, that there were a few bands further north within the Pilot Mountain HMA & that they watered at one certain spring. Shallenberger gave me his telephone number & indicated he could show me where they were if I wanted to see them, recommending coming in the Spring.

The “Functional-at-Risk with a Downward Trend” Carnelian Spring had a GPS of: 38.36494 deg. N; 117.96238 deg. W; 7,161’ elev. A geologist on the tour explained how a major fault zone caused this spring’s upwelling. Bighorn sheep, mule deer & domestic cattle were the three main large herbivores present. But, in spite of this being part of their legal HMA, no mention of wild horses was made. The BLM range conservationist revealed that in the enclosure at Carnelian Spring the following species grew: Red Top, Douglas Sedge, Blue Grass, Spike Rush, Veronica & Clover. Black-tailed Jackrabbits & various species of songbirds also loped or flitted about here. Everyone but the grazing permittee & his companion seemed alarmed at the pedestalling & surface erosion of soils. A barren exposed area reached out 100’ or more from the spring due to cattle “camping,” or lingering in & around the spring. It was obvious that this was being converted into a wasteland, causing many natural species to disappear.

Warner Corral Spring had a GPS of 39.38157 deg. N; 117.98895 deg. W; 6,585’ elev. & was in the very worst condition imaginable! Hence, its professional rating was “Non-Functional.” Here the BLM District Manager gave each of us an opportunity to give our own opinion concerning what was happening at this

spring & what could be done to rescue it. Nearly everyone recommended either fencing the whole spring area off or not allowing cattle to graze in this part of the allotment in order to permit the ecosystem to restore itself. Some recommended both. The grazing permittee Holmgren suggested bringing in a D10 Caterpillar to reshape the spring landscape & create a more ample reservoir to collect the spring water & permit the cattle to drink. One tour participant called this spring & vicinity a “sacrifice area” & recommended complete cow-proof fencing. Another thought that the eroded areas should be filled with rocks & soil & that grasses should be planted here to convert the place into a meadow. “But for whom?” I tacitly asked.

The Appropriate Management Level for wild horses In the Pilot Mountain HMA is from Low 249 to High 415 with mean of 332; the acreage in the HMA is 477,133. At the mean AML, this works out to 1,437 acres per individual wild horse. The vast majority of the HMA simply has no wild horses. Obviously their rights are not being defended & in spite of the WFHBA, which, in its Section 2 (c), mandates them to be the principal presences. In 2017, 642 wild horses were estimated through a census, which corresponds to 743 acres per individual wild horse (compare the 50 acres per cow-calf pair for Holmgren’s year round cattle allotment). By any reasonable standard, this is an underpopulated, not overpopulated, HMA that should be restored to a more truly viable wild horse population level. Also, these horses should not be further pushed off their legal habitat! Concerning the latter, I was alarmed when BLM WH & WB Specialist Axtell said he was disappointed that the wild horses present at the south end of Walker Lake still remained. He merely stating they were “destructive.” With beliefs like his, it is no wonder our nation’s wild horses continue to be “falsely maligned & unjustly set up & squeezed out.” This situation represents an “agency capture” by the very segments of our society that the WFHBA intended our officials to defend America’s wild horses & burros against!

Rancher Shallenberger offered more details than Axtell, indicating that at least some of the wild horses here still annually migrated to higher mountains during warmer seasons.

Before leaving, I photographed the Warner Corral spring & some attractive angles of nearby spectacular canyons, peaks & pinyon-juniper woodlands in the mellow last rays of day. At 4 PM, we all headed back home, many to Carson City, Nevada’s capitol, arriving after dark at 7 PM. Some of the tall mountains we spied here are Pilot Peak at 9,182’ elev., located just north of the town of Eddyville; Table Mountain at 7,822’ elev. & Muller Mountain at 8,310’ elev. This fascinating & scenic area deserves a lot more attention from both Nevadans & Americans! Strong input should be given to the Carson City BLM & BLM’s state & national offices as well as to legislators & the media so that the “national heritage” mustangs here can be restored to a higher, more truly long-term-viable population, while cuts are made in the plainly excessive cattle numbers that are seriously damaging the ecosystem. The springs we visited should be protected & restored & wildlife species, including the mustangs, allowed to reestablish themselves – to fill their respective niches at viable levels according to their age-old wisdom/instincts.

### **Blythe Giant Horse Figure & onto Arizona Wild Burros & Wild Horses starting with Cibola-Trigo HMA**

**4/19-20/2018, 6:15 PM to 7:45 AM:** Camping out near Big Maria Area of Critical Ecological Concern (ACEC) on BLM land. Strong wind arising. Observe intaglio of a horse dated to ca. 900 years ago by University of California-Berkeley archeologists. (See photo below.) Though some Native Americans & BLM officials claim this represents a puma, its long legs & hooves are not puma-like. The head is much more horse- than puma-like; & the juxtaposition of body parts & their relative proportion, especially the

long neck, legs & trunk, suggest a horse, as other professionals agree. The figure orients NW to SE & measures 54.1' from head to tail & its body is 7.5' wide. Its legs are 26.2' long. At the end of each leg is a small half circle accurately depicting a horse hoof. A coiled figure below the horse may depict a snake & is 8.8' wide. Many other intaglios are found in the area including a giant human 105.6' long with head pointing south & torso & arms measuring 91.8'. Temperature is a mild 61 deg. F. at 7:45 AM.



*Blythe intaglio strongly resembles a horse, viewed from posterior toward anterior. April 2018. Copyright by Craig C. Downer*

4/20/18: 8 AM on: I head south from the Big Maria ACEC to the border town of Blythe CA then pass over into Arizona on US Interstate 10. Stopping to observe the Sonoran Desert, I notice many blooming trees & shrubs, including various cacti & the impressive Palo Verde, whose green trunk photosynthesizes, thus allowing it to shed its leaves during extreme heat. Arriving at Quartzite ca. 11 AM, I head for the public library to learn more about the herds & their ecosystems that I am about to visit as well as the best way to enter the Cibola-Trigo WH & WB HMA to the south. A friendly librarian gives me basic directions; from my maps & BLM printout I soon orient myself & begin striking south on US Highway 95 towards Yuma. Before leaving, I converse with a young family who turn out to be very interested in the wild horses & nature conservation in general. So I gift them my 60-page booklet entitled "America's Wild Horses & Burros Must Make a Comeback!" As I drive south, it cheers me to know that the vast Kofa National Wildlife Refuge lies to the east. Though its fantastic pointy peaks & deep valleys beckon, I leave this for another time.

1:13 PM on. I turn west off 95 on Cibola Road & travel toward the Cibola-Trigo WH & WB HMA. Temp. 80 deg. F. I enter a BLM primitive area & head up Gould Wash, where my BLM printout indicates there is a herd of 60 to 75 wild horses. Though I survey a large part of this area, including with high-power Bushnell binoculars, & explore several entrances, I see neither horses nor any sign of their spoor. Then I

enter around Castle Dome, where 50 to 60 wild horses are indicated on the printout, but again, in spite of minute inspection, none appear. In order to continue west, I have to obtain clearance from the U.S. Army, as this is part of the Yuma Proving Grounds. I am fortunate, since there are no current combat trainings or bombings & the control officer allows me to proceed across the HMA to the Colorado River. A bit beyond the control point, however, a startling sign indicates danger from laser radiation of the scattered sort that can affect both eyes & skin -- which gives me the creeps! I drive 12 miles to a fork where a road leads south toward Gould Wash in the area of Trigo Mountain. The temperature is 79 Deg. F. Driving toward Felipe Pass, again I am disappointed to find no sign of wild horses or burros. Many military airstrips & warning signs are posted, however. --Basically, this seems like a very hectic & dangerous place for the naturally living horses & burros!

2:10 PM: 81 deg. F. Continuing west on Cibola Road, I notice neither sign of wild equids nor cattle. 2:22 PM: At a vantage point, I again scour the area with binoculars; no wild equids are seen. It is extremely dry; the most abundant plants are Creosote bushes. Statuesque, 12'-tall Saguaro cacti are also present, alongside orange-blossoming Ocotillos that grow several feet high with their many flexible & thin, thorn-covered branches radiating from their bases at ground level. I surmise that the low plant productivity here has a lot to do with why BLM designated this as a wild horse & burro HMA. This is similar to what happened to Native Americans relegated to their bleak reservations.

2:34 PM: Stop to photograph the intriguing desert. GPS: 33.38671 deg. N; 114.37615 deg. W. 1,155' el.

2:55 PM: I arrive at an abandoned well with an old corral & the remains of an old adobe building. Sprayed on the well is "FATUEADO," which may be a misspelling of the Spanish word "fatigado" meaning "tired," perhaps placed by illegal immigrants who may have been in desperate straits. I notice moister air wafting from the Colorado River a few miles to the west. GPS here is: 33.40489 deg. N; 114.42618 deg. W. 917' elev. Several gully washes tell of torrential rains & dramatic flash flooding.

3:17 PM: At a major, 250'-wide wash, I again imagine violent flash floods that transpire during cloudbursts. Temperature is 83 deg. F. Some of the many species present include an orange-colored plant parasite known as "Dodder," in the Cuscutaceae family. Also present are Rabbit Brush (*Chrysothamnus* sp.), more of the stately Palo Verde trees in blossom, as well as the ancient-looking Creosote bushes. The latter may live over 11,000 years in some deserts of the West, e.g. Mojave. 3:19 PM: Carrying on west, I cross some deep, loose sand with heavy corrugations that I am lucky to traverse without getting stuck. I have to gun my SUV AWD & undoubtedly loosen some bolts in the process -- but made it! On the other side of this ordeal, I encounter fresh spoor of a few wild burros with their distinctively compact & square-ish hoof prints as well as their small, ball-like droppings that rejuvenate soils with humus & successfully disperse the intact seeds of many desert plants. GPS here is 33.41092 deg. N; 114.44791 deg. W, 829' elev. I am surprised that after travelling several miles within the designated Cibola-Trigo WH & WB HMA, this is the first evidence of any wild equids.

3:29 PM: Continuing west on Cibola Road, I observe Ground Squirrel (*Citellus* sp.) holes & dens at the base of Creosote bushes, along with Rattlesnake tracks & my first Barrel Cactus, which is 6' tall. Also encountered are Cholla colonies on a lower flat. The piercing needles of this cactus lie all around in the form of breakoff segments. These can fester in flesh, so I proceed gingerly.

3:41 PM: I encounter a 17' Saguaro alongside several shorter Ocotillos growing from the hard, dry desert pavement, but no equid spoor. Traces of desert mice, lizards & snakes reveal their nocturnal activity. GPS: 33.42022 deg. N; 114.46164 deg. W. 817' elev.

3:44 PM: I drive further west. The vast Palo Verde Valley, opens to the NW, intervening between the Palo Verde Mesa lying many miles distant & on the California side of the CA-AZ border.

3:51 PM: At junction of Cibola Road & Erhenburg Road. 85 deg. F. Interstate Highway 10 is 17 miles to north. A barren rocky plateau lies just east of the Colorado River here. GPS is 33.43619 deg. N; 114.48554 deg. W; 737' elev.

3:53 PM: Trigo Mountain & Mohave Peak lie to the SSW. From its tracks & a broken Palo Verde branch, I note that a solitary burro has stopped abruptly & interpret these signs as a possible burro poaching & removal by people in a vehicle. I drive several miles further to the SSW toward Cibola Lake & Cibola National Wildlife Refuge, but turn back, deciding to go there another day.

4:03 PM: More burro droppings noted in a wash to the south of an intersection. Here I encounter a fellow visitor with a large truck with mounted camper on the back. I also observe a Kangaroo Rat & photograph my first visible Wild Burro!

4:13 PM: GPS is: 33.43156 deg. N; 114.50469 deg. W; 640' elev. A small group of burros browses amid a thicket of trees & bushes. I also notice the distinctive 2" cross-like track of the Greater Roadrunner. These can fly, but mainly run, & are also famous for being able to kill poisonous, even aggressive rattlers. This spot sports green mustard forbs & imposing Palo Verde trees, as well as a pungent desert bush in the legume family that has bright green leaves & is 10' tall & 20' wide. My guidebook reminds me this is the famous Mesquite (*Prosopis juliflora*), a common bush/tree of the Sonoran desert. Further along, I notice moist soil in the wash as well as much ORV disturbance & tracks of a desert fox & a Cottontail Rabbit. Present too is the fragrant Sage (*Salvia* sp.), sacred to Native Americans. Daisies & Saltbushes accompany several burros a few hundred yards away; several Mourning Doves are cooing to the west. Their music lends a special tranquility to the scene. A third of a mile to the east, the broad Colorado River flows deeply & swiftly. At 200' wide, it carries the precious "lifeblood of the desert." 4:21 PM. I drive SSW toward the river. The temperature is 100.1 deg. F.

4:25: I notice & photograph a large, white blimp-like aircraft, possibly military, ca. 20 miles to the south. This must be huge to loom so large from this distance. GPS: 33.42852 deg. N; 114.50741 deg. W; 675' el.

4:48 PM: More burro droppings & tracks by road. Photo. The burros here are becoming more active as daylight recedes. In general, they become more nocturnally active as temperatures rise later in the Spring & into Summer & Fall. The crepuscular hours see a renewed energy & playfulness in them as well as other species. They all seem to engage in a mutually delightful, interactive dance – the ancient, yet ever renewing, dance of life! GPS: 33.42387 deg. N; 114.54226 deg. W; 567' elev.

4:53 PM: I choose a campsite to pitch my tent. This is on a high rise just to the south of a dry creek bed, which enters from the east into the Colorado River. Here a burro trail enters to a drinking & bathing spot at the river. During the night, I hear the braying of several donkeys & realize they are having a real gettogether, splashing, bathing, grooming & interacting in a variety of ways. This fascinates me; I learn a lot about these ancient & beneficial, life-enhancing presences by way of eavesdropping.

Now I will continue with the more detailed ecological examination of the Cibola-Trigo HMA & the other HMAs I entered. First I will give some details concerning the methodology I employed, particularly in performing the ecological transects.



*Alert Wild Burros by Creosote & Palo Verde with Trigo Peaks in background. April 2018. Copyright by Craig C. Downer*

### **ECOLOGICAL EVALUATION OF HMA'S BY TRANSECT WITH GRAPHS & ADDITIONAL OBSERVATIONS**

**I welcome those interested to read my report on the WARM SPRINGS WH & WB HMA OR0007 (BURNS OREGON BLM).** This is available upon request. Warm Springs is also treated in my report from 4/2018.

The ecological evaluation manual I used was from United States Geological Survey, *et al.* (2005 in Bibliography). And its methodology includes:

**Assessment of Three Major Ecological Attributes made for each transect performed. These attributes are: Soil & Site Stability (SSS); Hydrologic Function (HF); & Biotic Integrity (BI)**

**Categories for ratings indicate deviations from what would be expected in the ecosystem under natural conditions & are as follows:**

**N-S = None to Slight; S-M = Slight to Moderate; M = Moderate; M-E = Moderate to Extreme; E-T: Extreme to Total.**

The 17 ecosystem features for which (among others) the above ratings were judged based on in-field observations correspond to the following: 1. Number & extent of rills; 2. Presence of water flow patterns; 3. Number & height of erosional pedestals, or terracettes; 4. Bare ground percentage from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground); 5. Number of gullies & erosion associated with gullies; 6. Extent of wind scoured, blowouts &/or depositional areas; 7. Amount of litter movement describing size & distance expected to travel; 8. Soil

surface (few top mm) resistance to erosion; 9. Soil surface structure & SOM (Soil Organic Matter) content; 10. Effect of plant community composition (relative proportion of different functional groups) & spatial distribution on infiltration & runoff; 11. Presence & thickness of compaction layer; 12. Functional/Structural Groups; 13. Amount of plant mortality & decadence; 14. Average % litter cover; 15. Expected annual production (total above-ground production, not just forage); 16. Potential invasive species; 17. Perennial plant reproductive capability. (See USGS, 2005 in Bibliography for further details.)

**Each transect is 100-feet long; & I note plants, animals, soils, rills, etc., going out 10 feet on each side. Therefore each transect is 100' by 20' for a total of 2000 square feet.**

**CIBOLA-TRIGO WH & WB HMA AZ001. YUMA ARIZONA BLM.**



*Three Desert Mule Deer in wash, Cibola-Trigo HMA. April 2018. Copyright by Craig C. Downer*



*Handsome Wild burro in Cibola-Trigo HMA with Trigo Peaks in background. April 2018. Copyright by Craig C. Downer*



*Close-up of wild burro near Hart Mine, Cibola-Trigo HMA. Note slender size connoting less forage consumption, especially when compared with one of the hefty cows & her calf that grazed on BLM lands today.. April 2018. Copyright by Craig C. Downer*



*Palo Verde in full blossom & with bees, backlit. Cibola-Trigo HMA. April 2018. Copyright by Craig C. Downer*



*Creosote in blossom, backlit. Cibola-Trigo HMA. April 2018. Copyright by Craig C. Downer*



*Illegal removal of Mesquite tree in Cibola-Trigo HMA. Other similar crimes observed. April 2018. Copyright by Craig C. Downer*

**Transect #1:** 4/22/2018, 8:30 AM; GPS: 33.42245 deg. N; 114.63382 deg. W; 249' elev. 100' x 20' transect NE down to SW on east side of Colorado River. High overcast. Photos 545 – 548.

Description: Stony, gravelly soil with some desert loam. Palo Verde in blossom. Mule Deer & Cottontail Rabbit tracks. Great Blue Heron near riparian habitat at side of river. Excessive litter waste left by campers is unpleasant & toxic, especially plastic & discarded fluids like oil from vehicles. Serious OHV problem with tearing up or compacting soils & vegetation. Campfire stone circles present. Observe burro droppings with intact seeds, also various bushes & Mesquite saplings springing up from burro dung. Many songbirds present. Exotic Tamarisk trees growing at side of river. Various aster forbs grow on riverbanks; some are clinging like vines. River is quite high. Honey Mesquite tree in blossom exudes delightful sweet aroma. Many small furry bees visit her blossoms. Other species include shore birds,

waterfowl & song birds. Many orange bubbles at edge of river – form of algae? Big wash & deeply cut stream bank just to north of transect. Like an impetuous charging bull, a large, black bumblebee flies from blossom to blossom. Palo Verde tree is 30' high. Its bright yellow blossoms are being visited by certain orange-yellow bumblebees that are a half-inch long. Human excrement & toilet paper; plastic dishes, cups & utensils; other contaminants lie alongside transect. This debris is major in quantity, amounting to many pounds & including hundreds of items. Such trash is a serious public problem and infraction of national, state & local laws; something should be done about it! Tamarisk tree with bright, light lavender blossoms grows near the riverbank as well as inland. Three American Coots swim in river, as the wild burros (aka donkeys) prune leaves off Mesquite & Palo Verde trees, breaking some twigs in the process. Desert Mule Deer are also seen & quickly dash off into the thicket (see photo). I notice where an illegal extraction of a large Mesquite tree has recently occurred; & in the manner of a detective, I document the evidence of thick tire tracks, four-foot-wide trunk hole in the ground & broken limbs (see photo). I estimated that this federal crime happened within the past week.

Departure from Expected: 1. S-M; 2. M. 3. S-M; 4. 70% bare ground, M. 5. S-M; 6. M-E; 7. M-E; 8. M-E; 9. M-E; 10. M. 11. M-E. 12. M. 13. M. 14. M. 15. M. 16. M. 17. M.

Attribute Ratings: Soil & Site Stability: M-E; Hydrologic Function: M-E; Biotic Integrity: M.

Conclusions: Main causes of degradation are definitely human, including vehicles, trash, removal of plants, trees, illegal poaching, burning, etc. The burros are causing a beneficial effect, seeding Acacia trees, building soils, opening thickets for other animals such as deer. There is a crying need for much more conservation education & enforcement of laws here.

**Transect #2:** Date & Time: 4/22/18, 8:30 AM. GPS: 33.41441 deg. N; 114.63686 deg. W; 234' Elev. Soil: 80% bare, shallow sandy powdery desert loam; Slope N down to S, 7%; Weather: Clear, morning breeze.

Description: Inland from Colorado River ca. third of a mile to east near a graded landing strip. Old discarded barrel potentially with toxic waste. Burro tracks & trails. 10' Mesquite tree. Creosote bushes w/ white flowers. Young Creosote saplings growing near Tamarisk trees. What appears to be old horse droppings, wild or domestic? Old barbed wire & dilapidated shed, old tires, discarded clothing, cans. Mesquite flowering nearby. Large earthen mound here created by surface rain runoff. Soil is powdery. Deer tracks frequent. Machine gun fire heard toward mountain, likely U.S. Army exercises. Remember that the Yuma Army Proving Ground is nearby. Are they killing animals for target practice? Are there any controls on their activities? This is a very "wild" place; & the most out-of-control element is the human one. Many of the trees & bushes here have deep &/or wide-spread root systems in order to gather water crucial to their survival, especially when temperatures often soar over 100 deg. F. Very few forbs & grasses are encountered on the soil surface. So much of the life here is permanently preserved underground. An Onagraceae tree parasite similar to Mistletoe grows on several Mesquite trees, which still manage to blossom. Diverse species interrelate & mutually adapt. Sign of deer & burro eating desert bushes, but not so excessively as to affect their survival. Actually, such pruning can increase their annual productivity. The sound of Gambel's Quail calling is cheerful & upbeat. Significant cow dung present. This area is being most heavily impacted by vehicles & the people who arrive in them. Frequent OHV (Off Highway Vehicle) entrances & trails are tearing up & fragmenting this landscape. Proof that burro droppings are restoring the soils & vegetation is abundant. (See Lundgren in Bibliography)

Departure from Expected: 1. M; 2. M; 3. M. 4. 80% Bare, M-E; 5. M; 6. M; 7. M. 8. M-E; 9. M-E; 10. M; 11. M; 12. M; 13. M-E; 14. M-E; 15. M-E; 16. S-M; 17. M

Attribute Ratings: Soil & Site Stability: M-E; Hydrologic Function: M-E; Biotic Integrity: M.

Conclusion: Deep-rooted bushes holding soils together here. Ecosystems holding on in spite of serious human disruption, especially by OHVs & including that of military personnel, hunters, fishermen, partiers, boaters & other visitors. Campsites are very unpatrolled & littered. I recommend the same remedies as for Transect 1 above.

**Transect #3:** Date & time: 4/22/2018, 12:37 PM. GPS: 33.30352 deg. N; 114.65017 deg. W; 256' elev. Photo # 522 toward Trigo Peaks. Weather: 93 deg. F. Location: Starting up Hart Mine Road from River Road. Slope: 5% E down to W.; Soil: 75% Bare. Desert loam with cryptobiotic crust, very shallow & rocky soils, some more impermeable desert crust, amounting to a third of the 100' transect.

Description: Burro & deer tracks here. Palo Verde in blossom being swarmed by many small bees extracting nectar. Cryptobiotic crust covered soil intact. Mesquite & Creosote thriving. OHV disturbance nearby. Also, large Black-&-Orange Bees (ca. 1/3 inch long) were pollinating the Palo Verde. Thick litter under Creosote bush & Golden-blossomed Mesquite tree. Thorny Mesquite growing to 25' high is spherical shaped & hosts nesting songbirds. Thorns constitute an evolved defense against herbivores, harkening back thousands of years. Desert soils with cryptobiotic crusts are present over most of this transect. Increasing OHV impact destroying these crusts occurs nearer the river. Mining is also causing severe ecological damage. Huge gravel borrow pits nearby add significantly to air pollution, especially of fine particulates that are dangerous to our health & that of many other species. Turkey vultures overhead are looking for rabbits, lizards & small rodents, which take cover in the shade of bushes.

Departure from Expected: 1. M; 2. M; 3. M; 4. 75% Bare M; 5. M. 6. M. 7. S-M; 8. M; 9. M; 10. M; 11. M; 12. S-M; 13. S-M; 14. M; 15. M; 16. S-M; 17. S-M.

Attribute Ratings: Soil & Site Stability: M; Hydrologic Function: M; Biotic Integrity: S-M.

Conclusions: The Burros here are helping this desert community by enriching its soils & seeding its plants – both through their droppings. They also dig wells of benefit to other species, both animal & plant (see Lundgren). I notice how trees & bushes here are channeling water from rain into the soils & underlying water tables. This minimizes the erosion of soils. I recommend the same remedies as for Transect 1.

**Transect #4:** Date & Time: 4/22/28, 1:09 PM; Weather: 98 deg. F. Clear; GPS: 33.30418 deg. N; 114.62893 deg. W; 402' elev. Photo: #521; Slope: NE down to SW, 5%. Soil: 80% Bare ground with desert loam, especially under bushes. Burro droppings.

Description: Signs of flash flooding & washouts, heaping up ridges. Tractor grading of road & entrances constitutes major disruptive impact. Most of the life of these soils is subsurface due to high temperatures & aridity. Tractor blading can be very damaging. Several healthy Creosote bushes are present. Brittlebush leaves are drying up & falling off. The scientific name for this highly arid-adapted plant is *Encelia farinosa* in the Sunflower family. Creosote bushes grow in close association with Brittlebush. Tall Mesquite trees grow nearer to or in gullies. Those present appear nearly dead, but in the desert such appearances can be misleading. The ecosystem here is being heavily impacted by nearby mining activities, including roads & excavations. Many serious washouts leading to the scouring of soils to bedrock are occurring. Further from the road, Mesquite trees & other plants are doing better; especially those on higher ground seem in better health, perhaps due to less damage by periodic washouts. The best soils are under trees & bushes or in association with burro droppings, whose incompletely digested food gives much nutrition to soil microorganisms, insects, rodents, lizards, birds, etc. A few lizards observed.

Departure from Expected: 1. M-E; 2. M-E; 3. M-E; 4. 80% bare, M-E; 5. M-E; 6. M-E; 7. M-E; 8. M-E; 9. ME; 10. M. 11. M; 12. M-E; 13. M-E; 14. M; 15. M-E; 16. S-M; 17. M-E.

Attribute Ratings: Soil & Site Stability: M-E; Hydrologic Function: M-E; Biotic Integrity: M-E.

Conclusions: Site definitely declining due to washouts, vehicle impact associated with the mining road & nearby excavations. Needed is an intelligent plan to restore the ecosystem & prevent serious scouring of soils during cloud bursts & to protect the ecosystem from toxic chemicals from mining that are probably influencing many species here.

**Transect #5:** Date & Time: 4/22/18, 1:35 PM. Weather: Clear, Hot: 100 deg. F +. Still wind. GPS: 33.30504 deg. N; 114.62043 deg. W; 454' elev. Photo: # 520, looking NE up the mountain road. Slope: NE down to SW, 10%. Soil: 65% Bare. Dark rocky surface with quartz. Some intact cryptobiotic crusts.

Description: This transect is near a stately, 9-foot Saguaro cactus whose ribs are moderately shrunken as an adaptation to extended aridity. This is a broad-sloping mesa present just before the foothills. Several dome-shaped Brittlebushes are rooted in cryptobiotic crusts. Several annual mustard bushes, Creosote bushes & Mesquite trees to 5' tall are also present. I notice a possible mutualism going on between Creosote & Mesquite species. Old beer cans under Mesquite. Swales hold water after rain for desert wildlife to drink, including birds, mammals, reptiles & insects. Burro & horse wallows can function in the same way. From various species' spoor, including tracks & droppings, I detect the presence of deer, coyotes, rabbits, burros & lizards. Some green serpentine rock outcroppings are also evident. A few more impressive Saguaros observed up the wash. As is so typical here in the Sonoran Desert, life's activity is going underground to escape from the harmful effects of intense solar radiation as well as harsh, drying winds, lashing rains from cloudbursts & other factors. Mining roads nearby have been recently bladed by tractors. Burro droppings are incorporating themselves well into the soils, including where they collect under plants.

Departure from Expected: 1. S-M; 2. S-M; 3. S-M; 4. 65% Bare, S-M; 5. S-M; 6. S-M; 7. S-M; 8. N-S; 9. SM; 10. S-M; 11. S-M; 12. S-M; 13. M; 14. M; 15. M; 16. S-M; 17. M.

Attribute Ratings: Soil & Site Stability: S-M; Hydrological Function: S-M; Biotic Integrity: M.

Conclusions: Area very exposed to wind & high plateau drainage due to undercutting of water tables. This is exacerbating aridity. Burro droppings helping to keep soils healthy by retaining moisture, also dispersing intact seeds to benefit vegetation. Also noted are some damaging effects of vehicles when they pull off a nearby road.

**Transect #6:** Date/Time: 4/22/18, 2:05 PM. Weather: 105 deg. F. Clear. GPS: 33.3086 deg. N; 114.61232 deg. W; 484' elev. Photo: Yes. Slope SW up to NE, 5%. Soil: 80% Bare. Desert pavement fairly intact. Silt.

Description: Near pyramidal peaks located just upslope to east. I again observe mutualism between Saguaro cacti & Mesquite trees, both in fairly good health. This desert holds many unique mysteries. Four Creosote bushes are mature & in full growth. Some colonies of this species (*Larrea tridentata*) that have been dated to over 11,000 years are considered the longest living individual organisms extant by some botanists. (But then who has asked the individuals?) This resinous shrub, aka "Greasewood," has waxy leaves that conserve water in its tissues; & its root tips excrete toxins that prevent other plants from growing close to it, including other Creosote – hence the regular ample spacing often observed, as though planted by people. Several dwarf Brittlebushes, ca. 6' tall & 12" wide, are present. An unknown composite bush is ca. 2-feet in diameter. A large Saguaro is beginning to parch. Sparse burro tracks present. Litter accumulating at base of Creosote. A large boulder, ca. 5' wide & located just below the

transect, is having beneficial effects for certain rodents, reptiles, insects & various plants living here. The boulder moderates temperatures & holds & releases moisture depending on the weather, etc. It is surrounded by a 30'-tall Saguaro cactus & a Mesquite tree. Creosote may survive better than most species in fact of increasing Global Warming. Vehicle & road impacts are major here. Burro droppings are again observed to be a positive for soils, seeding of plants, moisture, etc.

Departure from Expected: 1. M; 2. M. 3. S-M; 4. 80% Bare, M; 5. S-M; 6. S-M; 7. S-M; 8. S-M; 9. S-M; 10. S-M; 11. M; 12. M; 13. M-E; 14. S-M; 15. M; 16. S-M; 17. M.

Attribute Ratings: Soil & Site Stability: M; Hydrological Function: M; Biotic Integrity: M.

Conclusions: This area is being significantly impacted by heavy washes from flash floods during cloud bursts & also from vehicles & nearby road & mining activities, including pollutants associated with mining that is contaminating air, water, soils, plants, animals, etc. Also negatively impacting here are hunting activities & visitors removing plants, poaching animals, collecting rocks, leaving trash, putting new oil into their vehicles & pouring their old oil out onto the desert soil & similar thoughtless activities. We need much better public education & law enforcement here!

**Transect #7:** Date/Time: 4/22/18, 2:46 PM; Weather: 105 deg. F. Clear. GPS: 33.29807 deg. N; 114.60151 deg. W; 671' elev. Photo: #510 on. Slope N down to S, 40 deg. Soil: 65% Bare, Rocky. 20% is intact cryptobiotic crust.

Description: Here I encounter a steep rock-debris strewn slope with break off, or scree, from higher boulders on southern exposure. Also bristly Cholla cactus. And the seven-foot, spindly & thorny trunk of an Ocotillo is in blossom. Twenty Brittlebushes, a few Saguaros plus one healthy, foot-tall Barrel cactus are also present. A burro trail with fresh tracks leads up the mountain. Bighorn sheep tracks are also present on these multi-species trails where spoor from coyotes, foxes, mule deer, bobcats & puma among smaller animals like jackrabbits, cottontails, rodents & lizards are encountered. A 10'-tall Palo Verde tree grows at bottom of the draw along with an amazing Beavertail cactus. This ecosystem is in fairly good condition. Nearby to the transect is a purple-flowering Mesquite with many dark gray- & orange-furred bees humming around the tree extracting pollen & inadvertently pollinating the flowers as they travel to other Mesquite trees. There is considerable sign of recreational vehicle damage, i.e. OHV/ORV/4WD & of hunter &/or shooter target practice causing much damage to trees, bushes & soils. Also, a huge mound of crushed ore from mining activities lies not far from transect & constitutes a major ecological disturbance. This mound can leach toxic chemicals such as sulfuric & nitrous acids for many years, poisoning this habitat for many species far into the future!

Departure from Expected: 1. N-S; 2. N-S; 3. N-S; 4. 65% Bare, N-S, gritty soil DG (decomposed granite) & loess, some desert litter decomposing to humus & burro droppings also; 5. S-M; 6. S-M; 7. S-M; 8. S-M; 9. S-M; 10. S-M; 11. S-M; 12. N-S; 13. N-S; 14. S-M; 15. S-M; 16. N-S; 17. N-S.

Attribute Rating: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M.

Conclusions: Ecosystem doing fairly well here. Main impacts from many excavations, OHR/ORV vehicles, hunters & hikers. Pollution of air, especially particulates, is also a big problem, given nearby US Army Yuma Military Proving Ground & all that goes on there involving explosives, desert warfare & training involving disruption of soils, vegetation, animal life, water sources, air quality, etc.

**Transect #8:** Date/Time: 4/22/18, 4:09 PM; Weather: 99.5 deg. F, afternoon adiabatic winds arising; GPS: 33.28635 deg. N; 114.65627 deg. W; 220' elev. Photo: #501 ff. Slope: W to E, level. Soil: 50% Bare. Gritty in places, silty in other. Has clay. Washouts of top-soils in parts of transect.

Description: Flat desert valley with tracks including of burros, near BLM information kiosk, which wrongly states that horses & burros are non-native to North America, ignoring the abundant evidence to the contrary (I take a photo of this). This misinformation is repeated in at least a few other kiosks I saw in the HMA. Many Salt bushes in the *Atroplex* genus occur here, especially in very alkaline soils. Burro trails & droppings are sporadically present. Also, Honey Mesquite bushes/trees. I encounter the spoor of Coyote, Bobcat, Jackrabbit, Cottontail Rabbit, desert rodents & lizards. Sand Devils with their funnel ant traps are present in sandy soils. Creosote bushes provide some limited shade. Wallows from burros in this clay-containing soil serve to create natural reservoirs that benefit a variety of plants & animals, large & small. There are a few man-made rocky piles here, perhaps made by Native Americas generations ago.

Departure from Expected: 1. N-S; 2. N-S; 3. N-S; 4. 50% Bare, N-S; 5. N-S; 6. S-M; 7. S-M, Wind; 8. S-M, some disruption; 9. S-M; 10. S-M; 11. N-S; 12. S-M; 13. S-M; 14. S-M; 15. S-M; 16. S-M, vehicles bringing in invader plants; 17. S-M.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M.

Conclusions: Road & vehicles causing pulverizing of soil, increasing its erosion by wind. Some plants are moribund, i.e. dying, on account of this. Yet this community revives remarkably even with moderate rain. Many of the vital life processes transpire underground where they are more protected from intense solar radiation, heat & desiccation. Hunters, poachers, prospectors & military personnel are also having significant impacts.

**Transect #9:** Date/Time: 4/22/28, 4:33 PM; Weather: Hot. 100 deg. F.; GPS: 33.27957 deg. N; 114.64787 deg. W; 333' elev. Photo: # 498 ff.; Slope: E down to W, ca. 20 deg. Soil: 75% Bare, near recently bladed road. Considerable leaf litter under bushes forming desert loam. Burro feces helping to build healthier & more water-retentive soils.

Description: At a high ridge leading into the Trigo Wilderness Area. Photo #500 looking east into the wilderness. A deep valley is nearby with some animal trails leading into it including for burros. Some of the aged Creosote bushes may be centuries, even millennia, old. This Sonoran Desert ecosystem is fairly intact in those areas with cryptobiotic crusts, but some desert crusts caused by flash flooding or cloudburst are sealed including with rocks & pebbles & have much less life in them. Afternoon winds are arising. Some scientists call these "adiabatic," a term that conveys how they relate to different air temperatures at different elevations, valley and mountain, & how these alternate & equalize between solar-radiated daylight hours & hours of darkness at night. Generally colder air that is denser sinks while hotter air that is less dense rises. So go figure how this applies to morning & evening winds up and/or down the mountain sides. I encounter twelve Creosote bushes along transect. A large embankment north of transect testifies to a recent, violently descending flash flood from the mountain. Fresh burro tracks are present. The serpentine rock here contains greenish copper compounds along portions of transect. I observe how the burro droppings are seeding many plant species & fertilizing the soils here. Remains of an old mining encampment rusts away nearby. Again in blossom, the Honey Mesquite exudes its sweet aroma, with which the whole place is redolent. A real treat! Also present: Palo Verde tree & Saltbush. I spot one lone adult burro standing in the shade of a Mesquite tree one mile to the south & take a photo of him. He begins to bray, perhaps to call to fellow burros. Finally I spot a few more burros coming down to meet him. These are large & dark – even black – which I consider unusual in such a hot climate, since black bodies absorb heat. They may be descendants of prospector burros & bring a remembrance of old times & partnerships -- & how much we humans owe them!

Departure from Expected: 1. N-S; 2. S-M; 3. S-M, at side; 4. 75% Bare, S-M, near bladed road; 5. S-M; 6.

S-M; 7. S-M; 8. N-S, intact desert pavement; 9. N-S; 10. S-M; 11. S-M; 12. S-M, Creosote association; 13. N-S; 14. S-M; 15. S-M; 16. N-S; 17. N-S.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M. Conclusions: This life community is holding on in spite of impacts from vehicles, mining, military, big wash-scouring floods & poaching. There is an urgent need for more vigilance & the application of laws that protect nature.

**Transect #10:** Date/Time: 4/22/18, 5:05 PM; Weather: 95 deg. F. Cooling; GPS: 33.28631 deg. N; 114.62659 deg. W; 372' elev.; Photo: # 495 ff.; Slope E down to W, 5 deg.; Soil: 68% Bare. Clayey soils interspersed with tumble of rocks brought down by flash floods or just ineluctable gravity & time. Rocks include purple jasper & green serpentine rocks.

Description: Near site of my camp. Transect is in an ephemeral stream down a draw with tall Palo Verde & Honey Mesquite trees, 10' to 30' high. There is ample evidence of torrential flash floods that have scoured this landscape, causing deep streambank cutting. I observe a Black-Tailed Gnatcatcher (*Polioptila melanura*) flying around the Mesquite trees & issuing his characteristic high-pitched, agitated "CHEE" song a few times in succession before subsiding, then churning this out again. These are year-round residents here that I find very musical. Their song seems to communicate the spirit of the place. I also encounter Brittlebush, Creosote in blossom & Tumbleweed, which is an exotic though very pervasive species in the West. Mule deer, quail, coyote, fox, bobcat, puma & burro tracks are also present along with the distinctive cross-shaped track of the Roadrunner (*Geococcyx californianus*), aka "Chaparral Cock." Again, I observe burro droppings to be greatly restoring the vitality of soils. These are serving to create fertile germination beds for many diverse plants. I encounter a jenny with newborn burro. She is very protective & steers off into dense thickets to avoid me. It is substantially cooler in the shade of the trees here, 10 or more degrees F. less. Honeybees are swarming around a Palo Verde tree with yellow blossoms. Several Brittlebushes encountered whose sweet fragrance precedes my catching sight of them. Many plants & animals still fight on & even manage to thrive here, but I must be honest; many do not. Yet perhaps those who appear to die live on with all those who remain alive! Many flies buzz around. A few rattlesnake dens are observed amid bushes & rocks. Holes in bank reveal dens of rodents, reptiles, even some species of birds, etc. Situated about 20' to the west, the Colorado River gives water & life to this riparian habitat in spite of its suffering seemingly over-whelming damage from vehicles, campers, hikers, fishermen, boats, litter, pollution, oil changes, etc.

Departure from Expected: 1. M; 2. M; 3. M-E; 4. 68% Bare, M; 5. M-E; 6. M; 7. M. 8. M-E; 9. M; 10. M; 11. M; 12. S-M; 13. S-M; 14. M; 15. M; 16. N-S; 17. N-S.

Attribute Ratings: Soil & Site Stability: M-E; Hydrologic Function: M-E; Biotic Integrity: M.

Conclusions: Though this is a severely impacted ecosystem, the tough desert-adapted life here rebounds largely due to the abundant water available & "osmosing" into the arid ground through a form of "capillary attraction" in from the border of the Colorado River. This transect is heavily impacted. Soils are scoured off in many places. Plants & animals are struggling to adapt to abuses by people. Greatly needed here is a curb on destructive activities, including recreationalists, miners, military personnel, hunters, fishermen, ranchers -- & who knows who else!

**Transect #11:** Date/Time: 4/23/18, 7:16 AM; Weather: 76 deg. F. Sunny. Clear; GPS: same as Transect 10, but slightly to west, ca. 50'. This is just E of Colorado river near my camp & just N of transect 10.

Photo: # 474 ff.; Slope: SE to NW, level; Soil: rocky & compact, with some litter & pollutants from campsites, like fuel, oil, charcoal & plastic.

Description: Burros are braying; Coyotes are howling & Mourning Doves are calling this early Spring morning! Female Great-Tailed Grackle (*Quiscalus mexicanus*) comes to visit me at camp, probably looking for a handout, or just to say "Good Morning!" This is an elegant member of the Blackbird family (Icteridae) whose lengths are 18" long in males & 14" in females as adults. He is remarkable for his yellow irises. Males are purple glossy black while females are brown -- the better to camouflage themselves while nesting. These grackles fly all the way south to Peru & are also extending their range northward in recent years. In transect, I encounter Creosote bush growing 5' high & a Mesquite grove whose members reach to 12 feet. Some large motorboats cruise the river, mainly fishing, or simply enjoying being in "God's fresh air & sunshine." A Palo Verde reaches 20' high & is in blossom. Its dead lower limbs provide shelter for rabbits, rodents & birds (photo #474). Some burro bones are scattered about on the ground. I observe the droppings of a Desert Bighorn Sheep who came down to visit the river. Some rusting box springs, an old gas tank & an old car constitute hazards here, but nature is gradually neutralizing & reabsorbing even these seeming misfits! I note deeply rooted bushes & trees at the stream's edge. These go several feet down into the earth. Considerable leaf litter accumulates under the trees. The latter in combination with burro feces is forming rich desert topsoil that will benefit myriad species. This thicket shelters burros, deer, & other animals. As many warn today, bees are becoming more impacted by pollution & are diminishing alarmingly, so seeing these bees swarming around the trees encourages me. A dusty burro wallow is nearby. A badger hole & track is noted at the base of a dead Mesquite tree. In spite of hot, dry conditions here, & even a proclaimed drought, the life community appears remarkably adaptive & resilient -- a real fighter for long-term survival!

Departure from Expected: 1. N-S; 2. S-M; 3. N-S; 4. 67% Bare, S-M; 5. N-S; 6. S-M; 7. S-M; 8. S-M; 9. S-M; 10. S-M; 11. S-M; 12. N-S; 13. N-S; 14. N-S; 15. S-M; 16. N-S; 17. N-S.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M. Conclusions: OHV/ORV trampling, trash & pollution from visitors as well as some cattle, are major disruptive factors. Burros, deer, songbirds, a variety of desert insects & plants as well as essential decomposers like fungi of the heat-tolerant variety -- all are struggling in concerted fashion to survive in this heavily human-impacted area. There is a serious need for better, stricter environmental protection, including the serious application of laws that instill a better conservation ethic among the public, one that includes a positive, rather than a prejudiced, view of the naturally living burros -- & wild horses, if there are any left in this vast Cibola-Trigo HMA!

**Transect # 12:** Date/Time: 4/23/2019, 7:57 AM; Weather: 77 deg. F.; GPS: 33.41444 deg. N; 114.63686 deg. W; 236' elev.; Photo: # 472; Slope: E down to W, 6 deg.; Soil: 75% Bare ground. Eroded gully with mixed desert plant litter. Sand & rocks present & some large boulders that have tumbled down. These boulders aid in heat & moisture balance that favors a more thriving life community.

Description: Three Creosote bushes along transect here are doing well in spite of erosion. They are deeply rooted. Humus forms from their leaf litter, especially when mixed with burro droppings & especially at base of bushes where protected from wind. Several annual plants have been parched by the sun. Here Honey Mesquite grows to 15' & Palo Verde grows to 18' & is in blossom at the edge of a broad wash. The burro hoof print near a small squash plant impresses me with how much smaller it is compared to the hoof print of a normal horse. Neither burro nor horse hoofs cut as deeply into the soil

when compared to many cloven-hoofed herbivores, especially heavy cattle. Many tracks indicate that the burros are moving frequently while foraging. I am amazed by the anastomosis of all the small & large gullies & washes & how they spread out as they come down from the mountain tops like the veins & arteries of our bodies radiating from the heart or like tree branches, twigs & leaves from the trunks of trees. This process is essential to keeping the ecosystem alive & thriving. The channeling of water from sky to plants to soils & on down along slopes to the Colorado River forms an efficient order to the natural life community here. I note dens of rodents & reptiles at the base of a majestic Palo Verde as well as at the base of more modest but nonetheless vital Mesquite trees. The openings of these dens are often under dead branches. Many Palo Verde petals cover the ground as several birds sing & I feel that I have entered Nature's Palace & we are all celebrating being alive together during this unique time.

Departure from Expected: 1. M-E; 2. M-E; 3. M-E; 4. 76% Bare, M; 5. M; 6. M; 7. M; 8. M; 9. M; 10. S-M; 11. S-M; 12. S-M; 13. S-M; 14. S-M; 15. S-M; 16. S-M; 17. S-M.

Attribute Ratings: Soil & Site Stability: M-E; Hydrologic Function: M; Biotic Integrity: S-M.

Conclusions: OHV & ORV are the biggest disruptive factors here, along with thoughtless trash, garbage & oil disposal. Deep rooted plants aid the community in withstanding this erosion-prone ecosystem that receives intense solar radiation, winds & lashing rains during cloudbursts. However, this particular ecosystem is doing fairly well in spite of all these impacts. The nearby abundant water source at the Colorado River bolsters this resilience.

**Transect #13:** Date/Time: 4/23/18, 8:15 AM; Weather: 88 deg. F. in shade. Clear, sunny; GPS: 33.41588 deg. N; 114.62709 deg. W; 244' elev.; Photo: # 470 ff.; Slope: W up to E, 4 deg.; Soil: 65% Bare, pulverized by trucks, jeeps & ORVs vehicles, especially those with large, heavy tires.

Description: This is the site of the apparent illegal removal of a large Mesquite tree. I estimate this happened within the past week. The soils here have been pulverized by the thick quad tires & the uprooting & dragging of the 30' tall, 3' DBH tree by means of nylon straps. Authorities need to stop this plunder of the desert ecosystem! Such majestic trees (that are mini-ecosystems in their own right) are often used in landscaping. Another species of purple-flowering Mesquite nearby is 30' tall. Another is 11' & bears profuse blossoms redolent with sweet fragrance. Many bees hum around extracting nectar. Their buzz produces a hypnotic effect on me. But the major ORV abuse to the ecosystem jars me awake as a tiny 3" grey finch with a whitish belly flits about & various songbirds sing. The same gold- & black furry bees grab my attention. Tumbleweeds are present. Large rocks at pivotal points along the wash divert rain water's surface-runoff. A rapidly flying hummingbird passes by issuing a high-pitched whistle. This appears to be Anna's Hummingbird (*Calypte anna*). To me, this area projects a Biblical quality. I read a note from a visitor: "Rains & Rot Restore Life Over Time," which seems so perceptive. Not all the people who come here come to despoil, to "live it up" regardless the expense to the great Rest of Life.

Departure from Expected: 1. N-S; 2. N-S; 3. N-S; 4. 65% Bare, M, soil by tree much richer due to leaf litter; 5. N-S; 6. S-M, disturbed soil; 7. E, due to removal of large Mesquite tree.; 8. M-E, OHV disturbing ground; 9. M-E; 10. M-E; 11. M-E; 12. M; 13. M-E, removal of tree; 14. M-E; 15. M-E; 16. S-M; 17. M-E.

Attribute Ratings: Soil & Site Stability: M-E; Hydrologic Function: M-E; Biotic Integrity: M-E. Conclusions: BLM workers should investigate the tree removal here. Ca. 2 acres have been badly impacted by this illegal operation, which has caused severe erosion & the loss of habitat for many species. This is a festering wound (see photo). Wood gathering for crafts or for simple burning also occurs here as well as

the likely supplying of landscapers with cacti & other types of plants & animals for pets or their skins or as food.

**Transect #14:** Date/Time: 4/23/18, 9:03 AM; Weather: 90 deg. F. Clear; GPS: 33.41246 deg. N; 114.62102 deg. W; 277' elev.; Photo: # 462 ff.; Slope E down to W, 2 deg.; Soil: 60% Bare. Shallow. Wash area. Sandy & rocky.

Description: Inland from Colorado River, east of N-S flowing river, paralleling OHV road. Many hearty Mesquites to 30' high. Palo Verde trees to 25' high. Bees here. Cheerful bird chirping. Soothing wind arising from east. A few Mule Deer spotted. They are very alert & scrutinize my every move, probably due to frequent hunting – including poaching. I get some fine photos of them (see photo). I also photograph a Sonoran Collared Lizard (*Crotaphytus collaris* subspecies) that is “all dressed up” hopefully with somewhere to go. He runs off with amazing alacrity! Honey Mesquites continue their flowery display. Many bees pollinating a full blossoming Palo Verde, which appears gnawed at the trunk, perhaps by deer, burros, porcupines. Young Palo Verdes have long, sharp thorns I treat with respect. The Mule Deer droppings are elongated & cylindrical, ca. half inch long. Cottontail's droppings are more round & spherical, ca. third of an inch long. This is the Desert Cottontail (*Sylvilagus auduboni*), which is pale grey with yellow tail & very large ears useful in dissipating heat. Many plants & animals of hot desert areas are pale in order to reflect the intense solar radiation & to prevent overheating. As mentioned before, the life of the soils is much more beneath the surface in these harsh, hot, dry & windy deserts, lending a subtle mystery to this ecosystem. All is not what meets the superficial eye! I notice that some burros have deposited dung on a recently deceased burro body in a shallow, sandy wash. Significance? Speeding its decomposition into soil? Paying homage to a departed fellow burro soul? What do you think?

Departure from Expected: 1. N-S; 2. S-M; 3. N-S; 4. 60% Bare, N-S; 5. S-M; 6. S-M; 7. N-S; 8. S-M; 9. S-M; 10. N-S; 11. S-M; 12. N-S; 13. S-M; 14. N-S; 15. N-S; 16. S-M; 17. N-S.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: N-S. Conclusions: Healthy ecosystem. Pleasant place. Many diverse minerals in the soils from mountain erosion. The absence of ORVs makes a big positive difference! Burros are still present & positively affecting the ecosystem. Some plastic & tin cans remind me of the reach of monster civilization. The sweet odor from Palo Verde blossoms is not as heady as the Honey Mesquite's aroma, but is still subtly pleasant. Litter decomposition proceeds well here, & the most basic ecological functions seem intact. BLM seems to permit vehicles to drive up washes that branch off extensively; however, this is causing much destruction of plant & animal life & of soils. This is breaking the natural cryptobiotic crusts in many areas. I also encounter many desert insects, including ants, as well as myriad lizards & rodents. The latter are mainly nocturnal in activity.

**Transect #15:** Date/Time: 4/23/19, 11:11 AM; Weather: 97 deg. F. Hot, clear, sunny; GPS: 33.42477 deg. N; 114.62196 deg. W; 277' elev.; Photo: # 458; Slope: S down to N, 7 deg.; Soil: 85% bare. Dark cryptobiotic crusts largely intact. Rocky ground with some sand.

Description: Impressive desert patina is present on rocks where these are not trampled by vehicles. East of Gould Wash. Higher & drier, more drained than earlier transects. Narrow animal trails run ESE to WNW, including burro, bobcat, deer, coyotes. Hummocky topography. Creosote in blossom. Dark black patina on rock little marred in area due to absence of vehicles, which cause wind erosion & loosening of cryptobiotic crusts in many places. A Lesser Nighthawk (*Chordeiles acutipennis*) is spotted flying low to

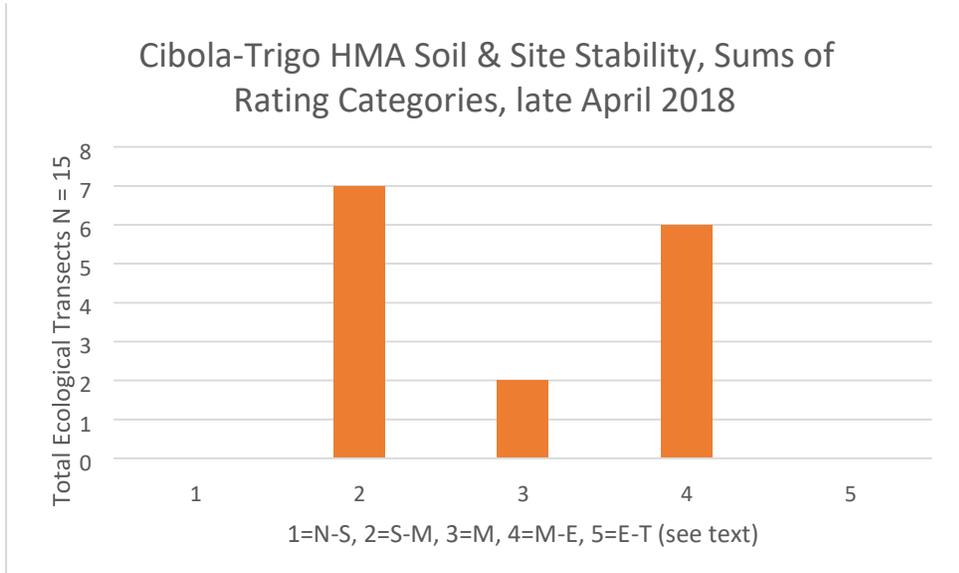
ground. It is ca. 9" long & issues a strange, whinny-like cry. This bird performs a distractive act to lure me away from her nest set amid large rocks. A Killdeer did this same sort of act yesterday near the river. Creosote bushes grow along wash. Yellow blossoming Palo Verde here is ca. 15' tall. Brittlebushes also present. The latter are very arid tolerant. Ecologically we say they are a very "xeric" adapted. The main disturbances relate to vehicles, especially ORVs – not burros! ORV paths are fragmenting the habitat & are having harmful effects upon smaller, ground-based terrestrial animals. Many tiny black flies whiz about in the air; some seem interested in landing on me, but I am quick to shoe them away.

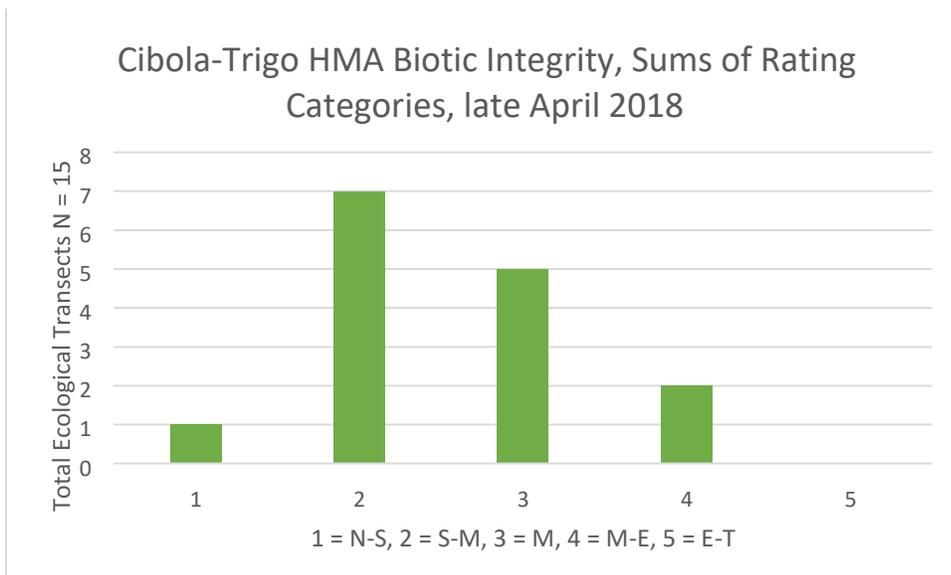
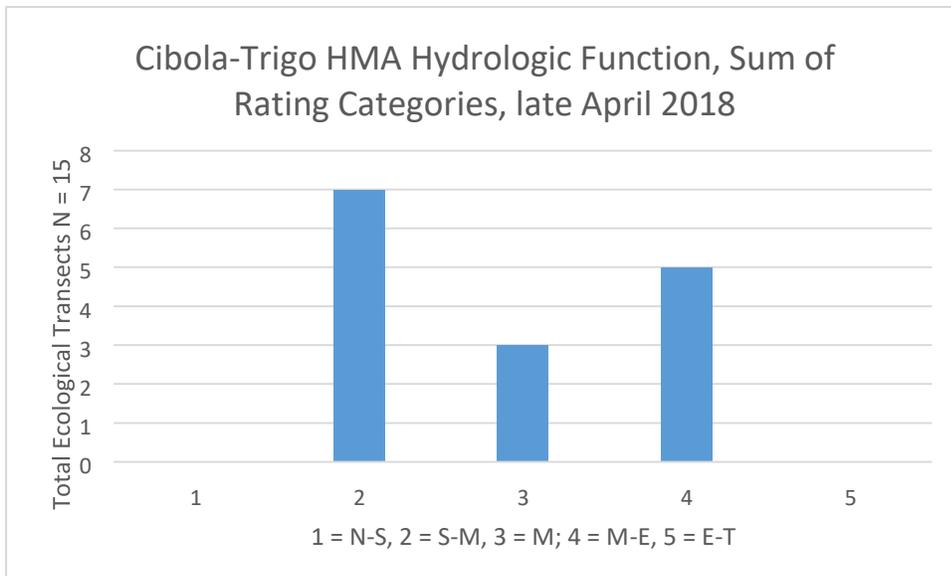
Departure from Expected: 1. N-S; 2. S-M; 3. N-S; 4. 85% Bare, S-M, OHV related; 5. N-S; 6. M, wind scoured; 7. S-M; 8. S-M; 9. S-M; 10. S-M; 11. S-M, OHV related; 12. N-S; 13. S-M, wind related; 14. S-M, wind related; 15. S-M, 16. N-S; 17. S-M.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M.

Conclusions: OHV (Off Highway Vehicles) & ORV (Off Road Vehicles) are causing the serious erosion of soils, which is seriously impacting air & water quality. Much particulate pollution is generated, including fine dust that filters deep into the interstitial tissues of the lungs & also plugs & smothers the pores of plants. The military proving grounds are also majorly impacting the ecosystem, e.g. toxic gases, gun fire & noise pollution that alarms animals, causing them fear & stress. Poaching & the removal of beautiful, often large, but also medium- & small-sized desert plants goes on here to a large degree & needs to be stopped or at least greatly curbed! I recommend a combination of increased public education & crucial law enforcement accompanied by the public divulgation of these serious sanctions.

Above is the final Cibola-Trigo transect. Later I will continue with wild horse & burro areas further north, but first I present the graphs showing the sums of rating categories for each Ecological Attribute.)





Overall the ratings show an amazing resilience of the biotic community in spite of significant disruptive impacts that this ecosystem is suffering. The nearby presence of abundant year-round water from the Colorado River probably explains a large degree of this resilience by this, none-the-less admirable & extraordinarily hearty life community.

**Havasu WB BLM HMA AZ0010 (Lake Havasu City AZ BLM)**



*Spectacular morning shot of rugged peak. Havasu WB HMA. April 2018. Copyright by Craig C. Downer*



Crashed Fighter Jet near Lake Havasu City AZ. April 2018. Copyright by Craig C. Downer

**Transect #1.** Date/Time: 4/24/18, 6:52 AM; Weather: 78.4 deg. F. Clear; GPS: 34.40444 deg. N; 114.16282 deg. W; 1,111' elev.; Photo: Yes; Slope: NE down to SW, 3 deg.; Soil: 85% bare, disrupted desert pavement.

Description: At my campsite north of Parker Dam off U.S. Hwy. 95. Wind-scoured landscape. Some spectacular sunset photos as well as early morning sunrise shots. No spoor of burros present. Rabbits frequently noticed. Upon making camp right after sunset, I heard a loud growling that I identify as a Bobcat's (*Felis rufus*). The evening wind cools the air after a hot day. Southwest-facing slope. Many signs of campers, much litter, oil dumping from vehicles, stone hearths, old discarded wrecks of cars, etc. This place needs cleaning & law enforcement concerning profuse waste, lack of hygiene by campers, etc. I note Coyote tracks & get a thrilling observation of a 3-1/2"-long male Costa's Hummingbird (*Calypte costae*) with his scintillating, gem-like purple throat & feathery protuberances from both sides of throat. He is soaring between flowering Creosote bushes that are sparsely arrayed along the terrain. The Palo Verde trees are even sparser here, but are still blossoming. Honey Mesquite remains present. A spritely Greater Roadrunner (*Geococcyx californianus*) runs rapidly upon his long & forceful legs. This very agile, seemingly nervous bird, in the Cuculidae family, is known to battle & kill even rattlers..

Departure from Expected: 1. M-E; 2. M-E; 3. M-E; 4. 85% bare, M-E; 5. M; 6. E. 7. M-E; 8. M-E; 9. M-E; 10. M; 11. M; 12. M-E; 13. M; 14. M; 15. M; 16. M; 17. M.

Attribute Ratings: Soil & Site Stability: M-E; Hydrologic Function: M-E; Biotic Integrity: M-E. (No graph due to only one transect conducted.)

Conclusions. Much damage to the habitat here from vehicles, campers, shooters, etc. There appears to be little law enforcement. I judge that the badly degraded ecosystem is due largely to ORV & OHV disturbance along with human disrespect & abuse of soils, plants, animals, e.g. oil changing, target practice & littering. The cryptobiotic crust is being broken; & the top soils are being scoured away by wind. Lake Havasu City BLM Field Office's details: (800) 213-2582 & (928) 505-1200; 1785 Kiowa Street. Note: Just north of Lake Havasu City at ca. 10:30 AM, I observed a fighter jet crash just short of a US Air Force runway & ca. 200' from where I was driving on Hwy. 95. (See photo.) Fortunately the pilot was able to eject. The crash site was quickly evacuated; fortunately, the jet did not explode. I wonder about the impacts of sonic booms & loud terrifying noises as well as crashes, strafing, bombing, emptying of excess fuel (J-6 jet fuel with its carcinogenic Benzene compounds) into the atmosphere, onto the ground & into bodies of water & its toxic effects on plants, soils, wildlife as well as us people. All this is associated with military jets & training out in the remote desert areas that are inhabited by the wild horses & burros & all wildlife, as well as human visitors & even some residents.

### **Black Mountain WB HMA AZ0003 (Kingman AZ BLM)**



*Healthy desert ecosystem in Black Mountain Wild Burro HMA west of Oatman AZ. April 2018. Copyright by Craig C. Downer*



*Harmonious Wild Burro in desert draw. Black Mountain HMA AZ. April 2018. Copyright by Craig C. Downer*

**Transect #1:** Date/Time: 4/24/18, 11:18 AM; Weather: 108.4 deg. F.; clear, sunny; GPS: 34.90089 deg. N; 114.42636 deg. W; 1,278' elev.; Slope: W down to E, 4 deg. Soil: 81% bare. Some micro-patches of topsoil between, along &/or under bushes.

Description: Between Golden Shores & Oatman on Historic US Route 66. Transect just to S of highway. Route 66 is a National Backcountry Byway. Sparse Creosote bushes accompany Brittlebushes in a wash. There is an occasional Palo Verde tree. Considerable OHV disturbance associated with hunters, possibly poachers, is much in evidence: many cast off shotgun shells, target shooting aftermath. Some sparse wild burro droppings are observed. Very hot site & much of the vegetation here is absolutely parched, at least on ground surface. Some very black desert patina is present on large rock surfaces. Old campfire stone circles are noted. A few birds take shelter in bushes & "gular flap" to cool off. A few short clump grasses, such as *Stipa*, are present amid bushes & rocks.

Departure from Expected: 1. N-S; 2. S-M; 3. N-S; 4. 81% bare, S-M; 5. N-S; 6. M, OHV & nearby main road; 7. M, ditto; 8. S-M; 9. S-M; 10. M; 11. M; 12. S-M; 13. M. 14. S-M; 15. M; 16. N-S; 17. S-M. Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M Conclusions: This is a "hot backed" desert surface with much sun-baked, dark patina on large rocks strewn about the landscape. A very harsh & arid life community. Again, the ecosystem is being impacted by vehicles, shooters, etc., yet life here miraculously holds on due to its rugged persistence & its remarkable preadaptation over thousands of years to extreme conditions, including the dramatic vicissitudes of

climate, natural cycles of abundance & dearth, etc. Due to proximity to the highway, this transect is influenced by people getting out & deliberately or inadvertently harming plants & animals. This is having a significant damaging effect. There is considerable evidence for wildlife poaching, especially the taking of desert plants & the shooting of animals. Many cartridges litter the ground.

12:30 PM. Arrive at the town of Oatman. It is 100 deg. F. I notice that several burros are in town & intermingling with people. This old, historic mining town is a big tourist attraction, & the burros are a large part of its success. I take photos from diverse angles of this quaint place, including some of its character-laden burros & townsfolk.

**Transect #2:** Date/Time: 4/24/18, 1 PM; Weather: 100.6 deg. F. Mainly sunny with a few billowing cumulus clouds being uplifted 1,000's of feet by hot thermal columns; GPS: 35.04396 deg. N; 114.39120 deg. W; 839' elev.; Photos: Yes; Slope: SE down to NW, nearly level; Soil: 65% bare. Little topsoil.

Description: Very rocky at a wind-scoured point on the mountain, frequented by hawks, falcons, vultures, etc. These raptor droppings fertilize soils, especially along rocky ledges where they perch. This transect is located on a dome amid peaks near the highway, just north of Oatman. As might be expected, there is a naturally arranged collection of Yucca, Ocotillo, Cholla, Brittlebush, & blossoming Creosote bushes. Burro droppings are contributing to humus formation & enriching soils & making them moister. Old discarded cars are rusting away. Some seemed to have plunged over the cliff from Route 66 – which is kind of eerie! Old mines with ore heaps & tunnels dot the landscape. These crushed ore piles leach toxic chemicals that affect plants & animals harshly. Some of the desert patina on the rocks is being disturbed by vehicles like ORVs as well as by hikers. Broken shards of glass from bottles, etc., are frequent. Cross-adorned memorials to deceased people & pets decorate the landscape. I spy a hawk hunting a rabbit. Raptor & scavenger birds are much in evidence. As mentioned, their white-gray droppings fertilize the soil thus aiding a variety of desert species. Nature is wise in her all-inclusiveness; I am awestruck by the many interspecific relationships tying us all together so much in evidence here. For every action there is an equal & opposite reaction” comes to mind. A high energy is palpable in this very scenic place as I contemplate the vast view to the west & its many receding desert mountains & valleys. These stimulate my imagination & enhance my sense of awesome all-unifying Time!

Departure from Expected: 1. S-M; 2. M; 3. N-S; 4. 65% bare, S-M; 5. N-S; 6. S-M; 7. M; 8. M; 9. S-M; 10. SM; 11. M; 12. S-M; 13. N-S; 14. S-M; 15. S-M; 16. N-S; 17. N-S.

Attribute Ratings: Soil & Site Stability: M; Hydrologic Function: M; Biotic Integrity: S-M

Conclusions: It is amazing how the plants here are thriving in spite of considerable impacts from humans on soils & rocks. Perhaps this has to do with this being a revered place that people treat respectfully. The high energy feeling here causes my nerves to tingle; I experience a comforting, broadened sense of Time. There are some serious damages occurring nearby due to a major caterpillar grading of the terrain. Some gully erosion is undercutting the water tables. Though cloudbursts often exacerbate this type of erosion, the major disturbances here are human-caused.

**Transect #3:** 4/24/18, 3:35 PM; Weather: ca. 100 deg. F, clear, wind starting to arise.; GPS: 35.03785 deg. N; 114.34896 deg. W; 3,164' elev.; Photos: #394 ff.; Slope: S down to N, 30% at 13%; Soil: 52% bare. D.G. (decomposed granite). Healthy soils mixed with desert loam.

Description: Coming down elevation & to the north on Route 66 from Sitgreaves Pass, I start to observe Juniper trees in healthy groves amid Yucca, exuberant clusters of Cholla & some Mesquite trees. A band of five wild burros moves vigorously around, selecting this & that plant to prune, including the Brittlebush, both leaves & some flowers. Eventually, the band divides into a group of three & a group of two, perhaps two “Mom-Pop” operations but with one of these having a nearly grownup youngster. This area must receive more rainfall than earlier areas I have visited. I observe the spoor of bobcats, puma & rabbits as well as hawk & falcon nesting areas amid white-streaked cliffs. Some large cottonwood trees in the valley below grow to 50’ high & are providing excellent habitat for birds, insects & a host of other creatures. I am able to get some excellent photos of the wild burros foraging near Route 66, including a jenny with her “burrito.” They are assiduously studying the terrain & foraging to keep fit & survive. This ecosystem appears to be thriving. Perhaps there is less of a rain shadow here in relation to prevailing winds & direction of storm arrival. The soils are richer in humus. The habitat seems more alive & sympathetic to plants & animals, though even extremely arid desert life can flourish remarkably when left to its own devices & not abused by people. This involves living creatures’ ingenious adaptations. Nearby ground squirrels (*Citellus* sp.) spy me cautiously from the entrance to their dens. A Say’s Phoebe (*Sayornis saya*) flits about catching insects near a mine just below Sitgreaves Pass at 3,550’ elev. A pair of Raven cavort acrobatically overhead, as I spy a *Datura* growing by the roadside. This is also called the Trumpet Flower & may have hallucinogenic effects in those who sleep in its presence. Bighorn Sheep & Quail spoor are also in evidence. The federally declared Warm Springs Wilderness is nearby. A nearby sign placed by BLM promotes the Black Mountain Wilderness Area. The town of Oatman also has some interesting plaques that describe the history of the wild burros & their relation to prospectors, mining operations, & townsfolk, including how one burro bit the rump of a spinster schoolteacher as she sat on the window sill teaching her students one hot day. On a less humorous note, not a single information source even mentioned that the close ancestors of the burros (*Equus asinus*) originated & evolved for millions of years here in North America, & no place more so than the Southwestern US & NW Mexico! As a biologist, this is a major oversight.

Departure from Expected: 1. S-M; 2. M; 3. S-M; 4. 52% bare, S-M; 5. S-M; 6. S-M; 7. S-M; 8. S-M, large rocks here.; 9. M; 10. S-M; 11. S-M; 12. N-S; 13. N-S; 14. S-M; 15. N-S; 16. S-M; 17. N-S.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: N-S.

Conclusions: In spite of a considerable degree of disturbance from vehicles, human visitors & both past & present mining activities, the ecosystem is recovering admirably – except for those areas heavily impacted by cattle! I encounter certain areas with tracks of cows & calves, though not in the transect area. Impressive litter accumulation at the base of bushes is forming humus, which often includes burro dung. This is producing a very healthy effect upon the life community, & I feel exhilarated here because of my communion with so many of the plants & animals. (No graphs due to small number of transects.)

**Cerbat Mountain WH HMA (BLM Kingman AZ HMA):**



*Beautiful Cerbat Mtn. wild mare with colt in bushy habitat. April 2018. Copyright by Craig C. Downer*



*Cerbat Mtn wild horse HMA with Beavertail Cactus in blossom. 4/2018. Copyright by Craig C. Downer*



*Spectacular scene with blossoming cactus, Pinyon pine & boulders. Cerbat Mtn. HMA. April 2018. Copyright by Craig C. Downer*



*Dapper young grullo mustang peers inquisitively. Cerbat Mtn. HMA. 4/2018. Copyright by Craig C. Downer*



*Same handsome mustang silhouetted against blue sky. Cerbat Mtn. HMA. April 2018. Copyright by Craig C. Downer*



*Alert mustang pair in their natural legal habitat value their life of freedom. Cerbat HMA. 4/2018. Copyright by Craig C. Downer*



*Water pipe draining high spring east Cerbat Mtn. HMA. April 2018. Copyright by Craig C. Downer*



*Rancher's bull in Cerbat Mtn. HMA. April 2018. Copyright by Craig C. Downer*



*Ancient petroglyph of Bighorn. Near Cerbat Mtn. HMA. April 2018. Copyright by Craig C. Downer*



*Colorful Murals by Native American artist Roy Purcell above Chloride, Arizona. Photo Copyright by Craig C. Downer*



*Plentiful grass & forage for wild horses but they're fenced out of this part of their legal Cerbat Mtn. HMA. April 2018. Copyright by Craig C. Downer*



*Pinkish-Purple Rattlesnake below Murals near west side Cerbat Mtn.HMA. April 2018. Copyright by Craig C. Downer*



*Cattle grazing near west side Cerbat Mtn. HMA. April 2018. Copyright by Craig C. Downer*



*Heavily damaged ecosystem due to cattle & vehicles, near west side Cerbat HMA. April 2018. Copyright by Craig C. Downer*



*Cattle guard w/o rebars creates danger for mustangs. Cerbat ridge. Cerbat Mtn. HMA. 4/2018. Copyright by Craig C. Downer*



*Barbed-wire fence at Cerbat ridge restricts wild horses from west side Cerbat HMA. April 2018. Copyright by Craig C. Downer*



*Healthy Pinyon Pines east of Cerbat ridge provide shelter for wild horses Cerbat HMA. April 2018. Copyright by Craig C. Downer*



**Transect #1:** Date/Time: 4/24/18, 6:43 PM; Weather: ca. 97 deg. F, hot, breezy; GPS: 35.36429 deg. N; 114.05396 deg. W; 3,890' elev.; Photo: #339 ff.; Slope: N down to S, 2 deg.; Soils: 52% bare. Good litter decomposition at base of bushes.

Description: Just west of Stockton Hill Road & north of Kingman, I observe three bands including a couple foals. Many cattle feces, tracks, including cows & calves. Grass is being heavily grazed. Desert Peach bushes (*Prunus Andersonii*) growing to 10' high. These have thorns to protect them from heavy foraging. There are many holes in the ground: some are dens of desert rodents, others are of snakes & lizards. *Ephedra* bushes present, aka "Indian / Mormon tea." Their bright green stems are foraged to a minor extent. Considerable OHV & ORV damage to soils & vegetation is occurring. The trampling of the soils by cattle is producing a serious degree of harm to this life community. Hardy Spanish Bayonette plants are also present. Like those of the Yucca, their sharp points serve to ward off herbivores. Chamise bushes & Saltbushes (*Atroplex* sp.) also abound. I am able to get some revealing photos of Spanish mustangs here. (See photos.) One stallion seems very worried & flees at a fast clip upon my arrival. This may indicate persecution by people, especially being shot at or chased. The Cerbat herd is reported as self-stabilizing in its numbers, but this may have a lot to do with illegal persecution, capture, killing, & the pre-emption of a large portion of the herd's legal habitat & water by cattle ranchers, as well as subdivisions. Also, the big-game hunting establishment, including the Arizona Fish & Game Department, has a history of plotting against these beautiful & intriguing, ecosystem-enhancing horses.

Departure from Expected: 1. N-S; 2. S-M; 3. S-M; 4. 52% bare, S-M; 5. N-S; 6. M; 7. M; 8. M; 9. M; 10. M; 11. S-M; 12. S-M; 13. M; 14. S-M; 15. S-M; 16. S-M; 17. S-M.

Attribute Ratings: Soil & Site Stability: M; Hydrologic Function: S-M; Biotic Integrity: S-M.

Conclusions: Including OHVs, ORVs & 4WDs, recreation vehicles are having major damaging impacts here. And the area is being overgrazed & trampled by many cattle. Yet, the wild horses are trying to do their best to survive. Something must be done to alleviate the clear overstocking of this range with cattle! I note fences high up on the mountain, including those restricting access by wild horses to water sources. It appears that these spirited Cerbat mustangs are being unfairly squeezed out of their rightful resources, including both water & forage, & there should be more of them & fewer cattle, ORV, OHV, monopolization of water sources, etc. Among existing public officials, elected representatives & concerned citizens, who cares enough to act on their behalf?!

**Transect #2:** Date/Time: 4/25/18, 6:24 AM; Weather: 78 deg. F. Sunny, clear; GPS: 35.41782 deg. N; 114.09194 deg. W; 3,980' elev.; Photo #337 ff.; Slope: SE up to NW, 5 deg.; Soil: 40% bare. D.G. with heavy cattle trampling, ORV damage.

Description: Upper end of Volk Canyon near where I camped. Heavy impact by cattle, but some healthy Mesquite bushes are present along a draw. Birds are singing to greet the sun. Prevalent ORV damage is causing erosion, especially from big tires bearing large weights with powerful "gunned" engines. Much cattle dung is evident. In spite of all this damage, some bushes & forbs are growing well, especially hardy plants like Saltbush, Cholla & Beavertail cactus. But grasses are not faring as well, with only a few of the hardier clump grasses managing to cling to life. I take some photos of the gorgeous, light purple blossoms of the Beavertail cacti. (See photo.) They seem to glow! Many Pinyon Pines grow here too, some to over 10'. Scattered sign of wild horses is present as droppings. One hundred meters to the

south is located a ranch with goats. Black-tailed jackrabbits run briskly off at my approach, then sit stock-still & eye me carefully. Their lidless eyes reveal their true identification as hares. Ant devil funnels frequent more sandy or powdery soils. Furry Honey Bees fly close to my hands as though inspecting me on my hike upslope. Other species I encounter include the Spotted Towhee (*Pipilo maculatus*), Western Scrub Jay (*Aphelocoma californica woodhouseii*), Willow Flycatcher (*Empidonax traillii*), Say's Phoebe (*Sayornis saya*), Black Phoebe (*Sayornis nigricans*), Phainopepla (*P. nitens*) & the Sage Thrasher (*Oreoscoptes montanus*).

Departure from Expected: 1. N-S; 2. M, undercut streambank; 3. N-S; 4. 40%, S-M; 5. S-M, big wash; 6. SM; 7. M; 8. M-E; 9. M; 10. M; 11. S-M; 12. M; 13. M; 14. S-M; 15. M; 16. S-M, Tamarisk; 17 M.

Attribute Ratings: Soil & Site Stability: M; Hydrologic Function: S-M; Biotic Integrity: M.

Conclusions: Area is being heavily impacted by cattle & vehicles, water sources are being monopolized, horses & other wildlife, deprived. Some serious gully erosion is causing undercutting of water tables, negatively impacting plants & animals. However, the soils are generally rich with important minerals. Adequate water sources occur here but should be made much more available to the wild horses & other wildlife. Only a few wild horse bands are observed. There is an urgent need for getting ranchers to reduce cattle pressure here & also for restricting vehicles from entering. Also some dirt roads should be closed off & restored as natural habitat. The topography here has accentuated relief implying that this habitat should be much more biodiverse & balanced. This would benefit high-relief habitats with more surface area for plants, animals & decomposers to live & interact on.

**Transect #3:** 4/25/18, 7:51 AM; Weather: 70 deg. F, few clouds, slight breeze; GPS: 35.41574 deg. N: 114.09402 deg. W; 4,021' elev.; Photo: #333 ff.; Slope: E up to W, 8 deg.; Soil: 60% bare, D.G., boulders.

Description: High up on the eastern slope of Cerbat Mountain, I encounter higher mesas with a considerable variety of plants & animals in spite of heavy impact from cattle, vehicles & hunters. Longhorn cattle are present with an XP brand on their left hips. A tall windmill is actively pumping water. In spite of its aridity, this HMA is being managed for intensive cattle production, which is causing pervasive degradation to the life community. An extensive Pinyon & Juniper (P-J) woodland occurs here & grows especially thick along a steeper lateral ridge to the south of the canyon. Dying trees with parasitic mistletoe show they are stressed. Saltbush & Mesquite are present. Some moribund Desert Peach still has mistletoe flourishing upon it, sapping its last vitality. Large granite boulders have been piled by Caterpillar tractors. Gambel Quail liven the landscape as they quickly run off issuing their high-pitched & startling cries. Minature Filarees in flower decorate the ground while flamboyant, rosy purple Beavertail blossoms attract more of my attention. I even catch sight of a Willow Flycatcher (*Empidonax traillii*)! This elegant bird winters in Central America but now finds itself here visiting a profuse sunflower patch. A yellowish-tan-furred Ground Squirrel observes me cautiously. The many soil-disturbed areas here afford the exotic Cheat Grass the opportunity to take hold. This becomes highly flammable during the drier seasons of Summer & Fall. A few Palo Vera trees are being visited by some bees, while some large, brightly colored orb spiders (Family Araneidae) spin their webs among the rocks.

Departure from Expected: 1. M; 2. M; 3. M; 4. 60% bare, M; 5. M; 6. S-M; 7. M; 8. M; 9. S-M; 10. M; 11. S-M; 12. M; 13. M; 14. S-M; 15. M; 16. S-M; 17. M.

Attribute Ratings: Soil & Site Stability: M; Hydrologic Function: M; Biotic Integrity: M.

Conclusions: Heavy negative impact is occurring here because of cattle. They are particularly devastating areas in & around water sources. Many were present during my visit. Also, vehicles are making the area more subject to unnatural levels of wind & rain erosion. Deep gullies, rivulettes & rills attest to this.

Hunter pressure also seems major, as attest many rifle & shotgun shells. The sealing off of springs & the piping out of major portions of their water are negatively impinging the wild horses. These are supposed to be the principal presences in the HMA, not given short shrift in their legal area! These issues need to be addressed & remedied so that higher, more truly long-term viable populations of the famous Cerbat Spanish mustangs can establish themselves & harmoniously adapt to this their legal ecosystem!

**Transect #4:** Date/Time: 4/25/18, 8:24 AM; Weather: Clear, warming, ca. 80 deg. F; GPS: 35.41265 deg. N; 114.09625 deg. W; 4,127' elev.; Photo: # 327 ff.; Slope NE up to SW 25 deg.; Soil: 35% bare. Rocky, some sloughing. Soil building around large rocks, bushes, trees & grass clumps that filter air of dust, etc.

Description: North-facing slope, sparsely treed with Pinyons & Junipers. Several Gambel's Quail (*Callipepla gambelii*) are running for cover amid short Gambel Scrub Oaks (*Quercus gambeli*), crying out in a lively, energetic & high-pitched manner. Several hot & arid adapted Sonoran desert plants are present, especially Palo Verde, Ocotillo & Beavertail Cacti. Some Cottontail Rabbits & Burros must be nearby, as their tracks indicate. Various shrubs similar to Rabbitbrush are present. One Pinyon Pine has grown to 20'. Several young Utah Junipers (*Juniperus osteosperma*) take root at the base of the mountain. Again some dying Scrub Oaks are laden with parasitic mistletoe clinging to their branches. Much sloughing of top soils is due to heavy cattle trampling & foraging that is killing plants clear to their roots. Their cloven hooves & heavy weight cut deeply into soils, especially moist ones. Yet, in spite of the many catabolic processes here, I am cheered by the euphonic cooing of Mourning Doves. Their song may seem melancholy to some, but I hear its special beauty. Tone-sensitivity is so important in the world of nature (see Krause, 2012 in Bibliography).

Departure from Expected: 1. N-S; 2. S-M; 3. N-S; 4. 35% bare, S-M; 5. S-M; 6. N-S; 7. S-M; 8. M; 9. M; 10. S-M; 11. S-M; 12. S-M; 13. S-M, oaks impacted; 14. S-M, related to rancher's cattle; 15. S-M; 16. S-M, by cattle; 17. S-M.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M. Conclusions: I observed only one track of a wild horse & no sign of any mule deer or the bighorn reported to live here in Cerbat Mountain. Upstream the spring is sealed off, & very little water is allowed to surface, thus depriving many wildlife species. This is wrong & something should be done to provide more water for wild horses & wildlife! Also I observe that these steep slopes are easily eroded by cattle, which are impinging upon the well-being of this ecosystem in a major way.

**Transect #5:** Date/Time: 4/25/18, 9:24 AM; Weather: Clear. Warm to hot. Ca. 85 deg. F.; GPS: 35.41087 deg. N; 114.10084 deg. W; 4,260' elev.; Slope: S down to N, 4 deg.; Soil: 30% bare. D.G. Rocky, disturbed by cattle, ORV vehicles. Spring being sealed off, drying up ecosystem. Hunters trampling.

Description: Present are Thornbrush, Beavertail Cacti with bright purple blossom, & an unidentified lavender flowered Phlox-like forb; Rabbit Brush (*Chrysothamnus* sp.) & Orange Globe Mallow (*Sphaeralcea munroana*) in blossom. Boulders are covered with ochre-colored lichen. A member of the Lily family, the Spanish Bayonette (*Yucca baccata*), is present & seems the ultimate survivor. It is highly adapted to ward off herbivores with its long, sharply pointed, dagger-like leaves, which grow from its base like a pin cushion. Its frequent presence reflects an adaptive response by the life community to heavy domestic livestock foraging. Some *Stipa* needlegrass clumps together with Squirreltail Grasses (*Sitanion hystrix*). The latter possess spikelets as terminal seed carriers, mainly to avoid being overgrazed. A blue-bell-like flowering forb intrigues me, but I key it out to Rydberg's Penstemon (*Penstemon Rydbergi*) in the Scrophulariaceae, or Figwort, family. Its earlier than normal flowering could

relate to Global Warming. Also present is a Serviceberry bush (*Amalanchier alnifolia*). I have encountered this species sporadically, especially near dying or decomposing trees. Saltbush is also seen near transect, as is another Beavertail, whose magical purple flowers & expressive shape again demand a photograph. I spot a wild horse grazing a few hundred yards up the mountain to the north & then another pair of brown mustangs further north & higher still. They quickly perceive they have been spotted & rapidly run off to hide within the cover of a Pinyon-Juniper grove. Such behavior indicates they may be subject to ongoing persecution—even being shot. I heard a snort of alarm by the stallion then a high-pitched warning whinny before they took flight. I also heard the flute-like song of the Western Meadowlark as well as the familiar Mourning Dove call. Sometimes birds warn of intruders, though I do not believe this was the case with these pleasant calls. We should pay careful attention to what naturalists call “soundscapes,” which constitute an important aspect of life on Earth & greatly influence our experienced quality of life (see Krause, 2012). Ask a whale or dolphin who is being bombarded by high-energy sonar in the name of national defense! I also note a pair of dark beetles around an inch long & some black flies near the old but still running windmill. This windmill’s brand is AEROMOTOR, & its creaking air vanes are in need of a lube & seem to protest the disharmony that people are causing in an otherwise harmonious Cerbat Mountain community.

Departure from Expected: 1. N-S; 2. N-S; 3. N-S; 4. 30% bare, N-S; 5. S-M, due to dirt road; 6. S-M, cattle trampling; 7. N-S; 8. S-M, cattle & OHVs; 9. S-M, due to road; 10. N-S; 11. S-M; 12. N-S; 13. N-S; 14. N-S, under bushes; 15. N-S; 16. S-M; 17. S-M.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M. Conclusions: Due to an intensive cattle operation with heavy foraging & trampling especially evident around artificially created watering ponds; the frequent presence of OHR/ORV roads & trails; & the sealing off & piping out of natural springs, this naturally endowed & biodiverse ecosystem is being heavily impacted. It is experiencing a declining trend. Many of the wildlife species are being harmed, including the wild horses, whose legal area this is. Here they should be the principally protected species!

(See Section 2 c of the WFHBA.) There should be a cutback in the livestock operations (see U.S.C.F.R. 4710.5 & 4710.6) & restrictions placed on entering vehicles.

**Transect #6:** Date/Time: 4/25/18, 10:02 AM; Weather: Sunny, Warm, ca 88 deg. F; GPS: 35.41018 deg. N; 114.10465 deg. W; 4,426’ elev.; Photo: 314 ff.; Slope S up to N, 5 deg.; Soil: 35% bare. D.G. Rocky. Some desert loam being formed.

Description: Observe 5 wild horses: 3 in one band, 2 in another. They look healthy, with estimated Henneke ratings ca. 4. The mares have not been PZP darted here & I pray they never will. The Cerbat herd is considered self-stabilizing; there are natural conditions here that would seem well suited to the Reserve Design approach to wild horse conservation that I have recommended for years. I notice Fox tracks just before the windmill. These match the Kit Fox (*Vulpes velox*) in my guide, due to their 2” size & compactness. The other fox indicated here is the Gray (*Urocyon cinereoargenteus*). Nearby, a 30’ tall Pinyon Pine (*Pinus monophylla*) calls my attention. Its Latin name denotes a single needle rather than multiple needles per sheath. The Southwest & Mexico are the evolutionary cradle of Pinyon Pines; the Earth continues to be home for several surviving species from this great radiation that encompasses millions of years. Contemplating this sheer & vast time scale relieves me from having to dwell too much upon the terrible destruction that currently besieges practically all Life on Earth. This magnanimous Pinyon Pine provides shade from intense solar radiation as well as important habitat for wild horses & other animals like Mule Deer. It cuts down on their need for water. I encounter a 6’-to-8’ high round pen

for the capture of cattle or horses. A wing fence leads into it. Much Yerba Santa is growing here & sports strong stalks. This is a forb-bush that often grows along graded edges of jeep trails on hot barren terrain. It is classified in the Waterleaf family, Hydrophyllaceae & the genus *Eriodictyon* & is dark green with serrations on its leaf edges. Its leaves are covered by a thick & pungent resin. Yerba Buena is a medicinal plant, recognized both by early Native Americans & by modern healers. Again I spot a Beavertail (*Opuntia basilaris*) displaying its attractive flowers. This distinctive individual is growing on a rocky knoll & sports vivid reddish-lavender, 2"-3" flowers that grow from the upper edge of its joints. This cactus reproduces vegetatively: a broken-off joint will quickly root in favorable situations. Its fruit is called a *tuna* & is edible. The wild horses I at first spotted gradually retreated from my view to take shade under a thick stand of Utah Junipers & Pinyon Pines in. A few Ocotillo grow in the poorest soils as well as a few clump grasses heavily reduced by cattle. A composite that keys to genus *Eriophyllum* is also noted.

Departure from Expected: 1. N-S; 2. S-M, OHV road, cattle; 3. N-S; 4. 35% bare, N-S; 5. N-S; 6. S-M, destabilizing because of cattle, OHVs; 7. S-M, ditto; 8. S-M; 9. S-M; 10. S-M; 11. S-M; 12. S-M; 13. S-M; 14. N-S; 15. S-M, cattle; 16. S-M, exotic grass & cattle; 17. S-M.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M.

Conclusions: A beautiful place in spite of cattle & OHR/ORV damage to the area. Still doing fairly well in spite of these impacts, but they are definitely taking their toll & should be addressed & controlled, even eliminated where possible. The knoll where I did this transect gets more precipitation & what I will call "energy flow" related to Earth's all-surrounding electromagnetic field. Both are very important factors for life's thriving. A memorial to a beloved child stands beside a possible grave. A few wild horse droppings are integrating well into the soils, aiding native plant germination. Wild horses enhance this ecosystem, but some people are messing up what should be one of Arizona's hidden beauty spots!

**Transect #7:** Date/Time: 4/25/18, 10:37 AM; Weather: Clear, sunny. 91.2 deg. F; GPS: 35.41111 deg. N; 114.10815 deg. W; 4,400' elev.; Slope ENE up to WSW 10 deg.; Soil: 50% bare. D.G., rocky, mix of quartz & granite, much cattle & ORV disturbance.

Description: As I ascend along a jeep trail, I note a black water pipe taking practically all of the water from a major spring down to ranchers & homes. This is a "big blow" to the natural ecosystem, as the aquifer/water table is being significantly lowered, producing a drying effect on the ecosystem, including the wild horses. BLM officials should do something so that the plants & animals have more water in this impressive & scenic Cerbat range! Cheatgrass is commonly encountered by the road. Scrub Jays put out shrill warning cries as I approach. Also the hoarse croaking call of an amazing Raven (*Corvus corax*) is heard overhead. The mustangs are no longer in sight, but a cool breeze from far away arises. I spy a Rufous-sided Towhee (*Pipilo maculatus*), whose a loping flight between oak trees seems like a cheerful dance. Recent cow feces are frequently in evidence. The Pinyon-Juniper woodland here contains pines growing to 25'; pungent Chamise-like bushes wear yellow blossoms. They are members of the Rose family & possibly belong to the *Adenostoma* genus. Horses, deer & other animals are known to brush against such resinous bushes to ward off biting insects. This has been proven in the Wheeler Pass JMA of the Spring Range of southern Nevada – a herd that has now been nearly eliminated because of hunter pressure upon BLM & USFS (see below). The broad cattle trail here is having a very damaging effect.

Departure from Expected: 1. S-M; 2. M; 3. S-M; 4. 50% bare, M, cattle trail; 5. M, at trail; 6. M; 7. M. 8. M; 9. M; 10. S-M; 11. M; 12. S-M; 13. M; 14. S-M; 15. M; 16. S-M; 17. S-M.

Attribute Ratings: Soil & Site Stability: M; Hydrologic Function: M; Biotic Integrity: M.

Conclusions: Jeep trail, spring tapping, OHR/ORV damage, cattle trampling, foraging & major trail – all these factors are causing many negative impacts to the ecosystem. Yet, the plants & animals here are valiantly struggling to survive in spite of thoughtless & arrogant impositions by a subset of humanity.

**Transect #8:** Date/Time: 4/25/18, 1:24 PM; Weather: Clear, sunny. 93.5 deg. F; GPS: 35.40848 deg. N; 114.11325 deg. W; 4,585' elev.; Photos: Yes; Slope: W down to E, 4 deg.; Soil: 60% bare. D.G. some large boulders.

Description: This transect is in a wash with large boulders on each side. A large, black plastic water pipe leads up toward a spring & is siphoning practically all of the water, thus depriving the natural ecosystem. Gambel's Shrub Oak & Orange Globe Mallow are present, also Yerba Santa, the Chamise-like bush & other species. Some mints grow where moisture from splits in the water pipe allow. A bright daisy similar to Oregon Sunshine brightens the scene. Saltbush occurs in drier areas along with some annual grasses. Also I observe a natural rock shelter that has been formed by an overhanging boulder. – Perhaps it is the perfect den of a Puma. Pinyon Pines grow to 25' here, while the Chamise-like bush grows to 10'. Excellent Mountain Lion habitat & also appropriate for Bobcats. The many large rocks & boulders present favor both felids. Evidence exists also for an ephemeral stream whose water surfaces when it rains. Mistletoe infects some of the Shrub Oaks & could reflect air pollution, both from nearby Kingman & from soil disruptions by cattle & vehicles.

Departure from Expected: 1. N-S; 2. M-E, due to piping out of spring water; 3. N-S; 4. 60% bare, N-S; 5. SM, is a natural gully; 6. N-S, sheltered area; 7. M-E, water being taken away & so affects what would naturally be a vital riparian habitat. 8. N-S; 9. S-M, due to cows, pipe; 10. M-E, could be much more exuberant were there more water; 11. S-M, cows, pipe; 12. M; 13. S-M; 14. M; 15. M-E; 16. S-M; 17. M. Attribute Ratings: Soil & Site Stability: M; Hydrologic Function: E-T; Biotic Integrity: M. (See Graphs.)

Conclusions: I did not encounter any wild horse sign here. The removal of the normal stream by means of capping the spring source & piping the water out are the major negative impacts. Photo # 300 is of a possible Mountain Lion den. Life is trying to hold its own here in spite of the huge robbing of the water source. More vegetation occurs higher up. Cattle & water removal are the major negative impacts.

**Transect #9:** Date/Time: 4/26/18, 7:27 AM; Weather: Clear, 84.9 deg. F.; GPS: 35.36193 deg. N; 114.05123 deg. W; 3,849' elev.; Photos: #275 ff.; Slope: E up to W, 3 deg.; Soil: 55% bare. Rocks with loam amid bushes, horse droppings providing beneficial fertilizer.

Description: Here on the eastern side of Cerbat Mountain, I spot a band of four wild horses: dapple grey, dark bay, light chestnut bay & a foal. They graze peacefully on a hill slope amid Creosote & Brittlebushes. Heavy cattle grazing & trampling are evident below the horses on the lower slope & in the valley. Cow feces (aka "pies") are nearly omnipresent. *Stipa* grass is present along with a Red Ant nest, which I photograph. A dead Yucca is in the process of decomposing & thus, is feeding the ecosystem. A Spanish Bayonette is clearly benefiting from this. Several cow-calf pairs are present. By a moribund Mesquite tree, I spot a Black-tailed Jackrabbit peering at me with a startled gaze. A large Packrat nest is snuggled amid large rocks. Also known as Woodrat, this is in the *Neotoma* genus. As to species, this could be the Desert or the Whitethroat or the Stephen woodrat. The Cerbat Mountain area seems to be quite a center of evolution for this genus; these rats are amazing botanists, collecting nearly all plant species within their home ranges in order to fabricate & elaborate their stick-structured nests. They add to these nests generation after generation, & these may be centuries, even thousands of years old. They even incorporate more modern objects, like shiny bottles, buttons & strips of cloth. Hence one of their names

is “packrat.” Hearing a wild horse’s soulful whinny in the distance, I await a response from another horse. Several songbirds also announce their presence, lending their indispensable notes to the unique “soundscape.” Continuing my hike, I reflect upon how smug people are to claim that wild horses are not truly “wild,” meaning not truly “natural.” For Heaven’s sake, they are much more natural than they are man-made! Science demonstrates that they count among the most ancient & long-standing of North American species, dating back millions of years & that North America is their evolutionary cradle. Yet people, especially those with vested interests, have targeted them for discrediting & elimination, not because they possess the greater truth or justice for doing so, but because of their narrow-minded attachments to backward & ungenerous ways of life & their self-limiting possessions & mutually assigned positions. Basically the wild horse cause is a challenge for us humans to learn how to share the land & freedom with such highly & anciently evolved beings as the horses. If we can do this, we will truly make a giant leap forward by allowing a wonderful presence to heal & restore the life community & to close up the grievous wounds the human lifestyle has caused & that very much threatens the future of Life on Earth today.

Departure from Expected: 1. S-M; 2. M; 3. S-M; 4. 55%, M; 5. S-M; 6. S-M; 7. M; 8. M; 9. M; 10. M; 11. M; 12. M; 13. M; 14. S-M; 15. M; 16. S-M; 17. M.

Attribute Ratings: Soil & Site Stability: M; Hydrologic Function: M; Biotic Integrity: M.

Conclusions: I approached the wild horses visible from Stockton Hill Road & took some revealing photos. (See above photos.) They were in fine shape with Henneke ratings averaging ca. 4. Following the horse trail leading up the mountain, I observed rich soils & the exuberant germination of plants around the mustang droppings, in contrast to poor soils & scant, less thriving plants found around cattle droppings. I was pleased to snatch some revealing photos of a small lizard playing “peek-a-boo” amid *Ephedra*, Globe Mallow & Desert Peach bushes. A tan Ground Squirrel (*Citellus* sp.) also presented himself, eyeing me nervously from his den. Recognizing these diverse presences without prejudice works wonders. But this requires some humility. By sacrificing our human-centered ego, we make possible greater blessings that arise from a universally attuned communion. I recommend reducing cattle grazing here & putting controls on Off-Road-Vehicles, etc., entering this area. These constitute major ecological problems.

**Transect #10:** Date/Time: 4/26/18, 8:24 AM; Clear, 92.2 deg. F.: GPS: 35.36138 deg. N; 114.05506 deg. W; 4,065' elev.; Photos: Yes: Slope: NE up to SW, 6 deg.; Soil: 60% bare. Very rocky slope, Most rocks measure a quarter foot to a foot in diameter. Much lichen grows on & breaks down these rocks, forming mineral-rich soils.

Description. Several distinct species of annual grasses & forbs are present, along with perennial bunch grasses growing near Saltbushes. A few splendid Mesquite trees also grace this unique place. With lightning velocity, a sunning lizard scampers under rocks at my approach. An overwhelming abundance of cattle tracks & droppings reveal that these poor slave animals are not being allowed to naturally adapt but are being foisted onto this land to strip its most nutritious vegetation & then taken off for human consumption. Though some ranchers claim the contrary, domestic cattle rarely contribute their remains to the ecosystem. This is obvious on the face of what is abundantly evident. The livestock’s “management” deprives the ecosystem that supports them, because they contribute their remains to modern human society, not to the natural ecosystem they are sent out temporarily to harvest! Drawn into this disturbing soliloquy, a blossoming Beavertail cactus comes to my rescue with its vivid flowers which lead me to notice a few small snails engaged in their intricately interrelated lives wedged between rocks. Some of the human households here possess horses in small corrals, either single or as pairs. But

they seem so bored & have eaten all the natural vegetation they can reach along their fences. Fresh forage is much more healthy & vital for them than bailed hay; they look at me with hope for deliverance from their confines. I notice fuzzy Fiddlenecks (*Amsinckia* sp.) with their distinctive, pungent bristles & hunched body shapes. These annuals belong to the Borage family & flower at Springtime. These hardy survivors help to repopulate disturbed areas, thus, preparing for later *seres*, or more biodiverse ecological stages. A thick, dark patina occurs on some of the rocks here, which makes me wonder whether I shall stumble upon any intriguing, ancient petroglyphs.

Departure from Expected: 1. N-S; 2. S-M; 3. N-S; 4. 60% bare, S-M; 5. N-S; 6. S-M; 7. S-M; 8. S-M; 9. S-M; 10. S-M; 11. S-M; 12. S-M; 13. S-M; 14. S-M; 15. S-M; 16. S-M; 17. S-M.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M.

Conclusions: This site is less impacted than others where I did transects due to much fewer cattle. There is more sign of deer & rabbits, also of predators like bobcat. Also, the rocky slopes help hold & preserve the soils. Spaces between the rocks are particular cradles for healthy soils. Also, bushes, trees & even grass clumps filter particles from the air that drop down to nourish the formation of soils. Both rocks & plants moderate temperatures & hold & release moisture equitably over time, moderating extremes.

**Transect #11:** Date/Time: 4/26/18, 5:31 PM; Weather: 103.1 Deg. F.; GPS: 35.40806 deg. N; 114.17099 deg. W; 4,474' elev.; Photos: Yes, including of famous Native American Murals, # 241 ff. (see photos); Slope: S down to N, 3 deg.; Soil: 35% bare. D.G. Some soil amid profuse shrubs.

Description: This is just up elevation & to the east of an old mining town called Chloride located on the western side of Cerbat Mountain. No sign of wild horses here. But there are several impressively colored minerals in the rocks & soils. The artistic & locally renowned "Murals" present are giant in scale & painted colorfully on large rocks & boulders. Their faces & forms are dynamically rendered to depict Native legends. Large open-pit mines still are in operation a few miles off; others are abandoned & leave much poisoned &/or disturbed ground where little grows. Near the murals, I encounter the hallucinogenic *Datura*, aka Trumpet flower, as well as healing Yerba Santa, august Mesquite, prickly Needle-grass in seed along with other less flamboyant plants. Wise old as well as lively young lizards are out absorbing the last rays of the sun. I sense a subtle high energy about this place, where I also encounter well preserved petroglyphs 1' to 2' square on a large boulder to the north of the murals. They depict Bighorn Sheep & other living creatures. A flamboyant 3' bush sports bright daisy-like flowers. Rocks here help catch & retain moisture, thus, moderating extremes of temperature for desert denizens. Called "Nostrum" by locals, many biting flies begin to discover my presence. A few Cottontails graze cautiously in the stream bed. Chief disturbances here are vehicles & people hiking around on the many trails. At 6 PM I am thrilled to observe a Cooper's Hawk (*Accipiter Cooperii*) soaring hundreds of feet overhead while searching the mountain for dinner. This spot is stimulating, very alive yet subtle.

Departure from Expected: 1. N-S; 2. S-M, slight trail; 3. N-S; 4. 35% bare, considerable rocks with heatproduced patina, S-M; 5. S-M, wash to north; 6. N-S; 7. S-M; 8. N-S; 9. S-M, trail, road; 10. N-S; 11. S-M, trail; 12. N-S. 13. N-S; 14. N-S; 15. N-S; 16. S-M, few exotic species brought in by vehicles; 17. N-S.

Attribute Ratings: Soil & Site Stability: N-S; Hydrologic Function: N-S; Biotic Integrity: N-S.

Conclusions: Damage from OHVs, roads, people, litter, pollution from mines, dust kicked up by vehicles, etc. However, the ecosystem seems to be doing well in spite of disturbances. The big positive here is that there are no cattle & the vehicles are confined to roads. Yet, these vehicles kick up a lot of dust that coats the plants, plugs their pores, aka stomata; & enters the eyes & lungs of animal. Cleansing rains must be greatly celebrated by all the sentient beings here.

**Transect #12:** Date/Time: 4/26/18, 6:15 PM; Weather: 94.8 deg. F, clear; GPS: 35.40678 deg. N; 114.17457 deg. W; 4,397' elev.; Photo: # 239 ff.; Slope N up to S, 4 deg. West exposure; Soil: 27% bare. Thick soil with rocks & desert loam from litter decomposition, especially under bushes.

Description: Near my encampment, I notice the formation of cryptobiotic soils between large boulders. Birds are singing at this crepuscular hour when so many creatures come alive during this "changing of day for night shifts." Flying Nostrum are out in large numbers. Some OHVs & hikers are disturbing the terrain. Brittlebush, Ephedra & Holly Leaf Oaks growing to 6' are present. Old Bighorn petroglyphs decorate a rock (see photo). Healthy Beavertail Cacti grow to 2.5', Ocotillo to 10', Squaw bush to 2.5'. *Stipa* clump grass with seed grows to 2.5'. Salt brush: to 3'. Some cattle manure contributes very little to soils. Some dead bushes are decomposing & passing their remains to new plants. A cool adiabatic breeze rises up slope, since air near the ground in the lower valley has superheated to 100+ deg. F. temperatures today --and hot air rises, as attest gargantuan cumulus nimbus clouds on the horizon. I observe a Little Brown Myotis bat (*Myotis lucifugus*) coming out ca. 7:30 PM & flying energetically in search of insects. It is amazing in its acrobatic flight. A flock of a dozen or so Gambel's Quail also rapidly run about, stirring up insects. A beautiful glow pervades the area here at sunset; the massive boulders themselves seem to emit a light of their own. Is this merely a reflection? I would like to believe there is a special transcendence to this austere place.

Departure from Expected: 1. N-S; 2. S-M, cattle; 3. N-S; 4. 27% bare, N-S; 5. N-S; 6. S-M, some cattle, trash; 7. S-M; 8. S-M; 9. S-M, from cattle; 10. S-M; 11. S-M, cattle & human disturbance; 12. S-M; 13. SM; 14. N-S; 15. S-M; 16. S-M; 17. S-M.

Attribute Ratings: Soil & Site Stability: S-M, heavy impact from nearby ORV trail; Hydrologic Function: SM; Biotic Integrity: S-M.

Conclusions: Fairly healthy ecosystem. Pollution includes particulates from the road stirred up by the vehicles & nearby mining operations, which can also emit toxic gases. No sign of wild horses anywhere, neither recent nor old. Appears they are being excluded by fences higher up. Cattle are causing some negative impacts but not as extreme as most other Cerbat Mountain localities I have visited. Many dirt roads are causing significant impacts. Yet, in spite of the above, this life community is doing remarkably well. This site is considered sacred by Native Americans, so perhaps locals do not overgraze their cattle or plunder money-yielding resources to the same disgusting degree they do in other areas.

**Transect #13:** Date/Time: 4/27/18, 8:24 AM; Weather: Clear; GPS: 35.40485 deg. N; 114.16424 deg. W; 4,758' elev.; Slope: S up to N, 5 deg.; Soil: 45% bare. D.G. Deep soils with desert loam

Description: West slope of Cerbat Mountain, ca. 10 deg. Slope. Meadowlark sings. Cool, adiabatic winds. Cooing of Mourning Dove (*Zenaida macroura*). Cottontail rabbit eating 2' clump of Needlegrass. An exuberant Beavertail Cactus grows alongside a Saltbush & a Mesquite. A bright yellow daisy accompanies a spindly Ocotillo. Some Cheat grass. Water accumulation in deeper soils. Globe Mallow & a few flies accompany a 5" Canyon Wren (*Catherpes Mexicana*), who sports chestnut feathers & a white throat. A few other birds of different species form a mixed-feeding flock with this wren. One of their prey is a nearly 2" Checkerspot Butterfly (*Poladryas arachne*). I also note a Funnel Trap Spider web and stay very clear of this very poisonous, yet still respected, desert citizen. On the way out from my camp near the Murals, I spot a very large, bright pinkish-purplish-reddish rattlesnake lying broadside across the dirt road. It is 4' long & at its broadest a half-foot wide & has 9 beads on its tail-end rattle indicating an age of 9 years. My first concern is to urge it off the road, as other vehicles are sure to come & kill this

amazing snake. Stopping my car, I go to examine the giant rattler & take several photos. (See photo.) I am especially impressed with its beautiful color & skin pattern. It remains very still making me think it has been run over, disabled or killed. However, when I come to within a few feet, suddenly it comes alive, rapidly coils & begins to energetically shake its tail rattle, which emits a high-frequency buzz. Such a warning should be appreciated as a gentlemanly way of permitting us to avoid a venomous, possibly lethal bite. As I back away, the rattler masterly retreats into some rocks & junipers. He coils around these in a way that disguises his presence. On the way out, I stop at Chloride to tell the museum curator about my encounter. She, as well a young man present, say I am very lucky not to have been attacked by this snake, which they claim is very aggressive, venomous & locally called the "Mojave Red." However, my search of the Peterson's Field Guide to "Western Reptiles & Amphibians" (by Robert C. Stebbins) led to a close identification with the Grand Canyon Rattlesnake subspecies of the Western Rattlesnake (*Crotalus viridis abyssus*). This could be a new distributional record for this subspecies. Regardless, this snake clearly brought a lively start to my new day here in the austere Sonoran Desert. Strangely, this desert elicits a special feeling in me that I best described as "magical." Do I perceive a subtle mystery here, some special, closely guarded secret? Another striking species I encountered was *Penstemon utahensis* that sported a carmine corolla as part of its red tubular flower. Specific hummingbirds pollinate these types of attention-grabbing flowers by inserting their long slender beaks & tongues deeply to extract their nectar. They then inadvertently pick up pollen, which they transfer to the stigma of other flowers of the same species that they visit, thus effecting their reproduction. Though not as flamboyant, I must also mention a Stripped Skunk, who quickly departed the scene in a blur. The Spotted skunk also occurs here. Members of the Mustelidae, these curious animals are very dramatic "black-&-white" characters.

Departure from Expected: 1. N-S; 2. S-M, road undercuts causing draining of soils; 3. N-S; 4. 45% bare, NS; 5. S-M, gully at far south side of transect & being exacerbated by OHV transit; 6. S-M; 7. N-S; 8. N-S; 9.

S-M; 10. S-M; 11. N-S; 12. S-M; 13. N-S; 14. N-S; 15. S-M; 16. S-M; 17. N-S.

Attribute Ratings: Soil & Site Stability: N-S; Hydrologic Function: S-M, vehicles; Biotic Integrity: N-S.

Conclusions: No sign of cattle, mule deer or wild horses, nor of coyote, puma or bobcats. Evidence I observe indicate that intense hunting & trapping is occurring, including out of season.

**Transect #14:** Date/Time: 4/27/18, 11:07 AM; Weather: Upper 90's F.; GPS: 35.45180 deg. N; 114.23035 deg. W; 4,087' elev.; Photos: # 212 ff.; Slope: SSW up to NNE 12 deg.; Soil: 70% bare. Very degraded by cattle, little top soils, rocky soil.

Description. Up elevation to the east along Big Wash Road, transect is located in a wash to west of road. This road undercuts the water table. Here I encounter a very degraded habitat, principally due to cattle. Many dying bushes & grasses are "present" but just barely. Cacti are very frequent here, including Barrel (*Echinocactus acanthodes*). Also Saltbush (*Atriplex* sp.) & some Utah Juniper, Spanish Bayonette, the very unusually shaped Ocotillo (*Fouquieria splendens*), *Ephedra*, Rabbitbrush, & some bright Orange Globe Mallow (*Sphaeralcea munroana*). Several Longhorn cattle are present, among more common breeds. Some Scrub Oaks provide some much needed shade. No wild horse sign whatsoever. A Greater Roadrunner is seen & runs rapidly off, though I still manage to get his photo.

Departure from Expected: 1. M; 2. M-E; 3. M; 4. 70%, M-E; 5. M; 6. M-E; 7. M-E; 8. M-E; 9. M; 10. M; 11. M; 12. M; 13. M; 14. M; 15. M; 16. M; 17. M.

Attribute Ratings: Soil & Site Stability: M-E; Hydrologic Function: M-E; Biotic Integrity: M-E. Conclusions: Extremely overgrazed & trampled by domestic cattle. Observe much rill erosion & sloughing of soil. Ecological trend here is seriously Declining. Strong wire fences here, 4 strand with top wire being barbed. Later at 12:53 PM, on my way to the ridgetop, I notice a very strong barbed wire fence along the Cerbat Mountain main dividing ridge. This appears to be excluding wild horses from entering the west side of the Cerbat Mountain range even though this is part of their legal Herd Management Area.

**Transect #15:** Date/Time: 4/27/18, 1:03 PM; Weather: Upper 90's deg. F; GPS: 35.44807 deg. N; 114.16476 deg. W; 5,966' elev.; Photo: #207 ff.; Slope: NE up to SW, 7 deg.; Soil: 75% bare. Rocky soil with D.G, but some substantial soil-forming litter forming at base of trees, bushes, clump grasses.

Description: As just indicated in Conclusions for Transect #14, at the ridge, I do observe a strong barbed wire fence separating the western from the eastern side of the HMA. Apparently this is designed to prohibit the wild horses from going to the west side of the mountain. This appears to be illegal. There are thick Scrub Oak stands here. These oaks are stunted, growing to just ca. 4' tall. Cow feces are prevalent on the western side of the fence. There are no wild horse display signs here that would indicate this is their legal habitat. I consider this a serious neglect of duty both to the wild horses & to all those millions of people who appreciate them & want them to occupy their legal habitats! Stands of extensive Pinyon Pine, aka One-Leafed Pine (*Pinus monophylla*), grow here. The terrain is scoured by high winds. Mountain Mahogany (*Cercocarpus ledifolius*) is found in extensive groves & provides a nutritious, year-round food source for herbivores such as mule deer, bighorn sheep & wild horses. The flowers have no petals but the seeds have feathery tails that catch them up in the wind & allow them to disperse far & wide. Some of these thickly bunched, fine-leaved bushes are over 6' tall. Also frequent here is a small Manzanita bush (*Arctostaphylos* sp.). Its berries are important to the survival of many diverse species, including song birds. Its bell-shaped, pinkish white flower contains a sweet nectar that is appreciated by man & beast alike. Also present is a grey-blue-green Buckwheat (*Polygonum* sp.) which is likely a vital, high-protein food for herbivores including deer, bighorn sheep & horses. A stunted Common Serviceberry bush (*Amelanchier spicata*) is fairly frequent. Ground squirrel dens are commonly present, especially in more disturbed areas. Spanish Bayonette is found in drier, hotter, southern exposures. Squawbush (*Rhus trilobata* var. *anisophylla* in the Anacardiaceae family) grows to heights of 4'. This is a welcome novel addition to my list of observed species. The intensely colored Orange Globe Mallow is again present. Also the colorful pink blossoming Desert Four-O'Clock (*Mirabilis multiflora* aka "Maravilla") is a delightful novelty. Its flowers open in the evening; the roots of this plant were & still are used for medicine by Native Americans. The "maravilla" is commonly associated with Pinyon-Juniper woodlands. A few sporadic Beavertail cacti are again hard to miss because of their bright violet flowers.

Departure from Expected: 1. S-M; 2. M; 3. S-M; 4. 75% bare, M-E; 5. N-S; 6. M-E; 7. M; 8. M-E; 9. M-E; 10. M-E; 11. M; 12. M; 13. M; 14. M; 15. M; 16. M; 17. M.

Attribute Ratings: Soil & Site Stability: M-E; Hydrologic Function: M-E; Biotic Integrity: M.

Conclusions: I observed no sign of wild horses in the immediate vicinity of the transect, though far below on the eastern slope of the mountain & by using my binoculars I was able to spot a small mustang band. There must be an active effort to keep them from filling their full niche here in their legal HMA. There is considerable soil disturbance & drying of the soils here, much wind erosion & disturbance by visitors. This is as high as I reached. Strong winds arose, convincing me to return to camp. Very strong winds later arose from the west; I had to stake my tent down with the aid of heavy rocks & guidelines.

**Transect #16:** Date/Time: 4/28/18, 9:21 AM; Weather: 64 deg. F., some high clouds; GPS: 35.46256 deg. N; 114.18790 deg. W; 4,805' elev.; Photo: #138 ff.; Slope: N to S, level; Soil: 40% bare. D.G. with some silt & litter starting to decompose.

Description: Rolling hills with P-J woodland. Quite arid. Utah junipers profuse with berries. Bunchgrass, Spanish Bayonette (*Yucca baccata*), Yerba Santa, common Yucca & Tobacco bush are among the species present. Much ecological disturbance here is being caused by cattle, vehicles, people & fences. There are no signs of wild horses; but much artificial seeding of exotic grasses has been done for cattle production. Some song birds are seen among the trees & bushes as well as some grasshoppers, which may also consume large portions of annual vegetative production. Nearer the road, there is more harm to the ecosystem, partly due to the undercutting of the water table by the road itself.

Departure from Expected: 1. S-M; 2. S-M; 3. N-S; 4. 40% bare, S-M; 5. S-M; 6. S-M; 7. S-M; 8. S-M; 9. SM; 10. N-S. 11. N-S; 12. S-M; 13. S-M; 14. S-M; 15. S-M; 16. S-M; 17. S-M.

Attribute Ratings: Soil & Site Stability: S-M; Hydrologic Function: S-M; Biotic Integrity: S-M.

Conclusions: Cattle impacts here are significant & are related to fences. Vehicles & roads are also producing deleterious effects. Yet the ecosystem is displaying a remarkable resilience, perhaps due to its fertile soils.

#### **Observations en route north:**

4/28/18, 9:45 AM: Back at U.S. Hwy. 93. 74 deg. F. Photo # 137 ff. Joshua Trees (*Yucca brevifolia*). This very statuesque tree often looks like a human at a distance. It has spiky, lance-like fronds & depends upon a single species of moth for pollination. This moth likewise depends upon this species of Yucca for its survival in a classic example of "obligate symbiosis" since neither species can survive without the other, or so it appears to most scientists today.

10:45 AM. I head NE on Pierce Ferry Road toward Dolan Springs then toward Grand Canyon to check out the Red Lake area where the lady at the Chloride Museum told me wild horses have recently been reported. En route I stop at Dolan Springs where an art show is taking place. Here I speak with Mr. Jay T. Schudy, who owns the Grand Canyon West Art Gallery where impressive metal figures he makes are on display. He tells me of rumors that the government plans to "get rid of the wild burros around here" but defends them as descendants of the early Spanish Padres' burros. Remarkably, these burros refill the niche of their not-so-distant ancestors going back from ca. 12,000 years to millions of years in North America. Mr. Schudy also tells me that some wild horses are, indeed, reported in the vicinity of Red Lake, around the intersection of Pierce Ferry Road & Antares/Stockton Road ca. 33 miles NE from Hwy 93. So, I am keen to be on my way & find them if they are there. He also insists that I visit the Grand Wash Joshua Tree Grove further to the northeast from Red Lake,, signaling it as the world's densest Joshua Tree forest & for its splendid nature trail & informative signs. I thank him & do follow up.

**Transect #17:** Date/Time: 4/28/18; 11:22 AM; 89 deg. F. Clear. Strong winds. Dust & sand in air. I observe & photograph what appears to be a mini tornado just east over the Red Lake, which currently has no surface water: GPS: 35.75677 deg. N; 114.11388 W; 2,848' elev.; Photos: # 133 ff.; Slope: N up to S, 2 deg. Nearly level; Soil: 70% bare. Sandy with desert litter loam accumulating at base of bushes.

Description: In Red Lake area, SW edge. Harsh wind from SW gusting to 50 MPH. Fragile, degraded desert ecosystem. Terrific wind erosion occurring. Currently being plowed, a furrowed field lies in the middle of Red Lake (no surface water visible) & is having tons of soil, sand & even smaller rocks lifted high into the air to form a huge tornado-like funnel. I estimate its reach to be over 1,000 feet. (See

photo.) This plowing epitomizes human ignorance & a near total disregard for the delicate nature of a desert ecosystem! To try to squeeze intensive agricultural crops out of a place like this shows wanton disrespect & is foolish. I take several revealing photos of what is going on here. OHR & ORV abuse is much in evidence alongside cattle impacts. Many fresh “cow pies” are observed. --Is this the only thing people can think of doing?! Some hardy Creosote bushes sport delicate white flowers. They are the main bushes here & are accompanied by a few Ocotillo cacti & a few clump grasses surrounded by predominantly barren ground. A fewer number of stately Joshua Trees also manage to establish themselves. Ant Lion funnel traps are also present, especially under Creosote bushes. A huge cow & her calf are observed along with their many droppings littering the ground. No wild horse sign is observed, nor do I observe any wild horses anywhere around, though I search with my binoculars for at least a half hour. I also drove on another road to the north of the Pearce Ferry highway to examine the terrain far & near. This took about an hour, though I didn’t catch sight of either wild horses or wild burros. Though I could not verify reports that the wild horses were here, these animals roam widely & can seek out hidden recesses where there is greater security from their human enemies as well as shelter from the elements. Indeed, the horse is the land animal who possesses the greatest running stamina of any land animal, which means that he can “run the fastest the longest.”



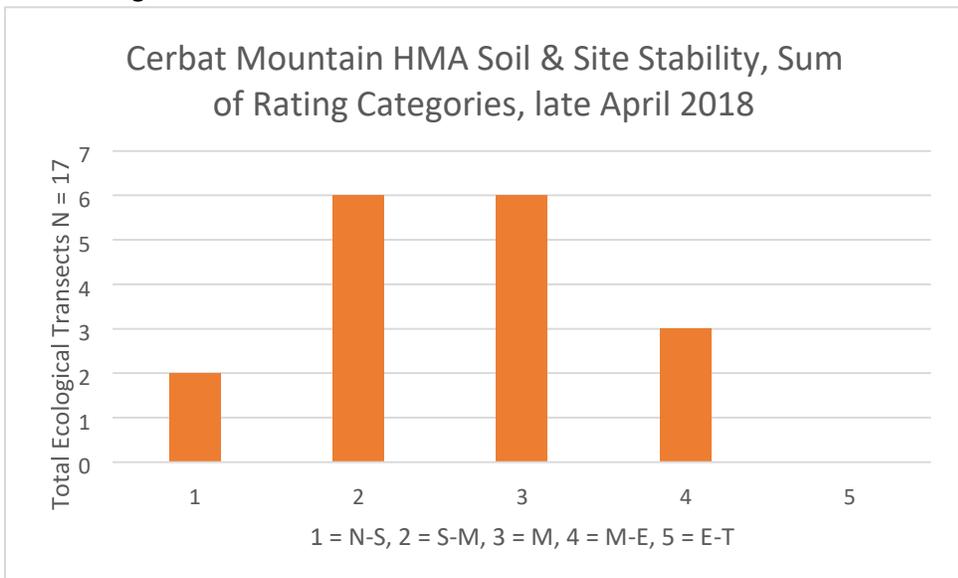
*Dust "tornado" near far northern end of Cerbat Mtn. HMA. Joshua Trees in foreground. April 2018. Copyright by Craig C. Downer*

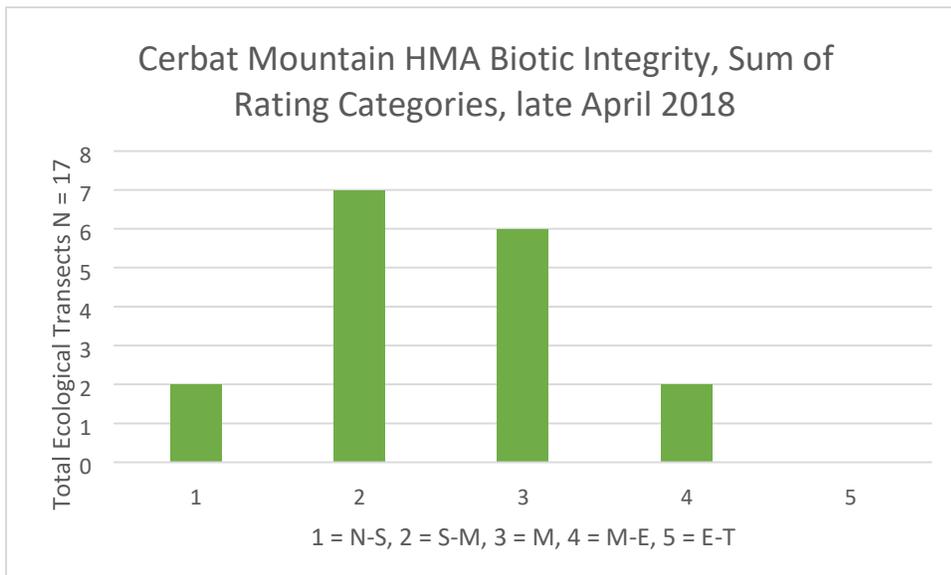
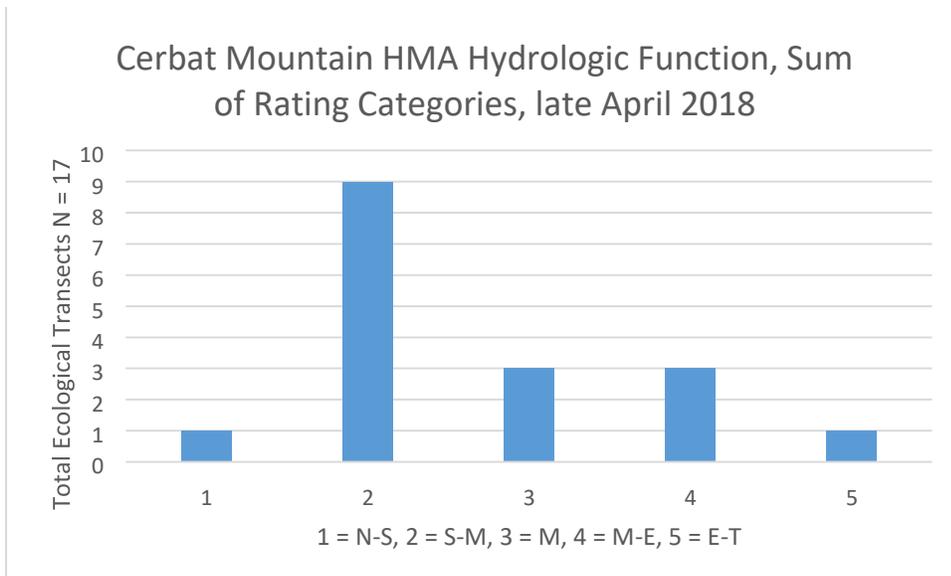
Departure from Expected: 1. S-M; 2. M; 3. S-M; 4. 70% bare, M; 5. N-S; 6. M-E; 7. M-E; 8. M-E; 9. M-E; 10. M-E; 11. S-M; 12. M; 13. M; 14. M-E; 15. M-E; 16. M; 17. M.

Attribute Ratings: Soil & Site Stability: M-E; Hydrologic Function: M-E; Biotic Integrity: M-E. Conclusions: This is a seriously impacted ecosystem with rampant abuse by people in the form of uncontrolled vehicle-caused erosion both on & off roads. Many of the dirt roads are unnecessary. Cattle trampling &

overgrazing are also very evident & extensive. Severe wind erosion of top soils reaches clear down to the bedrock. The mini tornado I observed & photographed really brought home the severity of the ecological abuses, especially as a red tractor continued to plow the surface of the dry ephemeral lake while the tornado lifted away anything bearing the slightest resemblance to vital top soils. I would term this “committing ecological suicide” & a general “dis-ease” of so much of Humanity today! Of course, there exists an urgent need to rectify this & all similar situations, but real concern & commitment will be required along with a very knowledgeable & sensitive approach. We humans must develop a more benign vision for the future of this awesome place & ecosystem, as well as all of the West, all of America & all of this precious Planet Earth that we share with all the great Rest of Life. It is our manifest home & a place of individual & collective learning & perfecting. But our emphasis should be on our being present here together with all species -- NOT MAN APART!

**(End of Cerbat HMA transects.)** Below please examine the three graphs for the sum of rating results for each Ecological Attribute in the Cerbat Mountain Wild Horse HMA:





From the graphs we can see that soils are being most impacted & that water seems to be doing fairly well, in spite of the sealing off of springs & the piping out of their waters in certain areas. The life community is being considerably impacted as indicated by a high number of ratings in the M category. And the wild horses seem to be taking the brunt of impacts as a generally “targeted” species, in spite of this being their legal area where they possess “principal” rights under the WFHBA. This is a special, aesthetically pleasing & lively remnant of the Spanish Mustangs, of great heritage value, that should be allowed much more resources & a much larger population to be truly viable & well adapted over time.

**Continued notes traveling on from Red Lake with visit to Grand Wash Joshua Tree ACEC:**

11:30 AM: I search all around with binoculars but notice no wild horses. I spy several desert roads some of which I drive up to further reconnoiter from vantage points. Still no wild horses. I give up for now & continue northeast on Pearce Ferry Road.

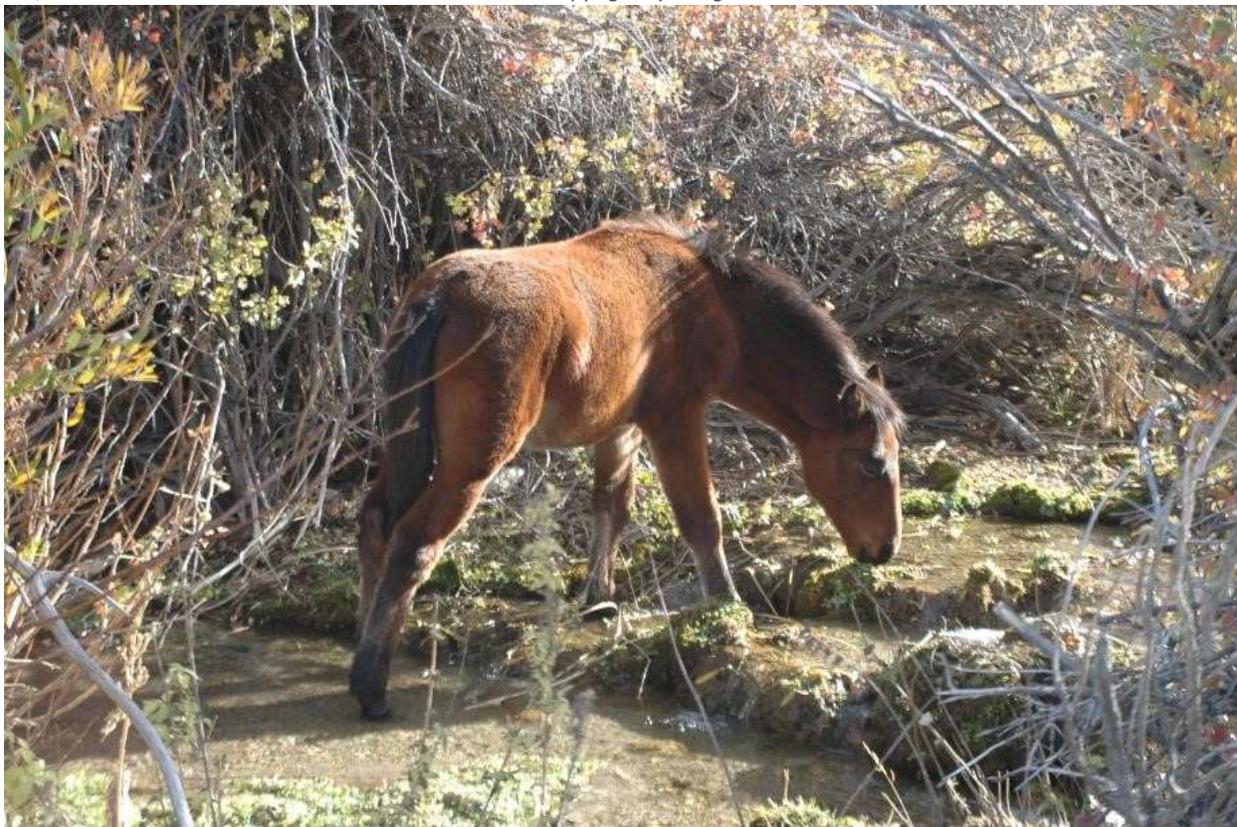
11:45 AM. I arrive at the Grand Wash Joshua Tree “Area of Critical Environmental Concern” (BLM). Here I take the recommended nature walk amid the “world’s densest Joshua Tree grove.” The public entrance is located at the corner of Diamond Bar & Pearce Ferry Roads. Temperature is 90 deg. F. & only a slight breeze & some shade of bushes or trees provide relief. I am elated with the many healthy plants & occasional animals I find along the trail. These seem to welcome me. The non-intrusive signs explain the local, natural & human history. To the east lie the dramatic Grand Wash Cliffs. Between 600 & 1800 A.D. this area was inhabited by Pitaya Pegsle Ute, Zeta Shoshone & Paiute Indians. The Paiutes are said to be Anasazi descendants. Another tribe here is the Hohalays, aka Hualapis – a familiar name! I get some decent photos, including of Cholla, Mojave Yucca & Black Bush. The stately Joshua Trees often tower over 20’ & there are hundreds of them. Animals include Great Horned Owls, Coyotes, Red-Tailed Hawks, Gambel’s Quail, Bobcats & various smaller desert-dwelling rodents & reptiles. Various grasses & flowering forbs are great additions to this natural fiesta. This natural desert garden is truly gorgeous & has an air of serenity & harmony about it. I am one of ca. 30 visitors.

12:25 PM: After a brief lunch, I return along the Pearce Ferry road to Highway 93 where I finally turn north toward my home state of Nevada. The road leads me over Boulder Dam & finally into Las Vegas by mid-afternoon. After a brief respite & gas fill up, I continue on 93 to the picturesque community of Cold Creek. This quaint town sits far up on the lower, gentler sloping flanks of colossal Spring Mountain & is about 45 miles to the northwest of Las Vegas. It is a familiar place, since I did extensive studies & composed in-depth reports in earlier years on behalf of the wild horses & wild burros here. My studies included an overflight of the entire range that involved an independent census of the wild horses & burros & was sponsored by a southern Nevadan wild horse & burro protective coalition.

**Observations of Wheeler Pass Wild Horse & Wild Burro Joint Management Area (JMA – HumboldtToiyabe N.F. & Las Vegas BLM)**



*Cool, Clear Water Pool at Cold Creek. Wheeler Pass JMA. Copyright by Craig C. Downer*



*Young bay-colored mustang drinks from Cold Creek. Wheeler Pass JMA. Copyright by Craig C. Downer*



*Stunning white mustang with band amid Joshua Trees. Lower Wheeler Pass JMA. Copyright by Craig C. Downer*



*Fences restricting access of wild horses to Willow Spring. Upper Wheeler Pass JMA. Copyright by Craig C. Downer*



*Bull Elk from herd introduced by NDOW to Spring Mtn. & Wheeler Pass JMA as big game animal. Copyright by Craig C. Downer*



*Dark mustang animates lower eastern portion of JMA. Vast panorama to east. Wheeler Pass JMA. Copyright by Craig C. Downer*



*Left to right: Rhea Little, Garnet Pasquale & Melissa Ohlson search for the wild horses & burros they defend. Eastern Wheeler Pass JMA. Copyright by Craig C. Downer*



*Stalwart band of mustangs enjoy being themselves, w/ 10,397' Bonanza Peak. Wheeler Pass JMA. Copyright by Craig C. Downer*



**4/28/18**, late afternoon: Greeted by my friends & fellow wild horse & burro defenders in Cold Creek, my first stop is at the home of Rhea Little & her husband Joel. Rhea has observed & defended these wild equids for decades & knows their habitat & history with amazing scope & detail. The Wheeler Pass area is known as a Joint Management Area (JMA) because it is managed both by the Las Vegas District BLM & the Las Vegas office of the Humboldt-Toiyabe National Forest. These agencies were soon to hold a public meeting to present & hear public input on their proposed roundup of all the wild horses in the area! Truly an extreme & draconian move about which Cold Creekians were very upset. They expounded to me upon the many solid reasons why the proposed action was unjustified. To wit: though federal officials claim they are eliminating the wild horses because of a lack of water & forage & the mustangs' declining condition, Cold Creekians' intimate knowledge of the wild equids & their habitats & my investigation indicated that the situation was not dire & that the horses & burros were being "set up".

I shared my PowerPoint on "America's Wild Horses & Burros" during my first evening & again on the following evening; I am grateful to Dr. Greg Clarke (who also obtained his degree in ecology from UCB) for putting me up. With the insights of an ecologist who has lived for years among these wild horses, Greg decried the officials' plans as deliberately concocted & false. Also Carmen & Carl Rhoda are a veteran Cold Creek couple who have observed & defended these horses & burros for many years. They were totally incensed at what was being planned. Heeding these solid fellow Nevadans' pleas, I decided to linger on in this picturesque place with its magnificent desert panoramas & to dedicate the following day to observe the sparsely distributed remaining mustangs & their habitat, including shelter, forage & water sources.

4/29/18: Starting out early at 7 AM, a beautiful sunny mid Spring day greeted me by offering a nearby mustang band. The horses were healthy & their body conditions averaged Henneke 4, which is fine for horses at this time of year. I did notice, however a certain apprehensiveness especially among the older adults, the veteran leaders & caretakers of the band. Perhaps this relates to the fact that some of their watering sources were being made inaccessible by government constructed fences & that they were also being fenced out of some of their legal area's prime foraging habitat, as I had been informed by Rhea Little & others here. Many of the dirty tricks were being played at choice habitat spots higher up in the Spring Mountain where the wild horses traditionally migrated during the hot southern Nevadan summers. The underlying reason for this was to make a hunter paradise out of the Spring Range; & this goal is strongly promoted by the Nevada Department of Wildlife (NDOW), one of the consistently worst enemies of the wild horses & burros, even though these species are very popular & valued by the great majority of Nevadan citizens. Basically, US Forest Service, BLM & NDOW were putting the squeeze on these beautiful & valued mustangs!

Their coats were full & had a fine sheen, which are positive health indicators. Also I observed that adequate forage & water were present for the small population of horses here. But the federal government officials of both agencies were lock-step with the Nevada Department of Wildlife to deny these wild horses & burros their legal & just share of the forage & water here. Again, this was clearly being done to favor big game including trophy hunters at the urging of the Nevada Department of Wildlife & various hunter organizations, including Elk & Bighorn hunters. Basically, BLM & USFS officials were abrogating their responsibility under the Wild Free-Roaming Horses & Burros Act (WFHBA) to defend the rights of these "national heritage species." These rights include viable population numbers &

sufficient forage, water, shelter along with all the other components that go together to make up longterm-viable habitats for both equid species – & both horses & burros are in this JMA.

Besides upland game birds, there are three main mammal species that are promoted by these three agencies in the Spring Mountain: Desert Mule Deer, Bighorn Sheep and introduced Elk. Yet, even though the wild horses & burros complement & balance out these ruminant herbivores within the greater Spring Mountain ecosystem, these government agencies have turned a blind eye to this important fact in order to wrongfully target the wild horses & burros for elimination or nearly so. Cold Creekians are particularly upset by a recent fence construction higher up in the Spring Range & well within the Wheeler Pass JMA. This fence has been deliberately constructed to fence out just the wild horses while allowing all the other species: deer, elk & sheep, upland birds, etc. to enter & drink. (See photo.) Though this seriously violates the WFHBA, the agencies whose duty is to defend the basic rights of the wild horses & burros have proceeded dishonestly in a very real plot to undo the true intent of the WFHBA.

At this juncture, we should examine the Wheeler Pass JMA (NV0507) more closely, including its number of acres & its assigned population Appropriate Management Level for wild horses & wild burros, etc.

For the 275,575-acre Wheeler Pass JMA & in direct opposition to widespread public wishes, the federal agencies have assigned outrageously low & genetically non-viable AMLs. For wild horses, the AML begins at a low of 47 & ends at a high of 66. So the mean is just 57 horses, which corresponds to **4,877 legal HMA acres per individual wild horse!** Basically, this is a wild-horse-empty habitat that makes a mockery of the WFHBA! Yet, the situation gets even worse for the wild burros who also possess legal rights here. These well-adapted & positively contributing desert dwellers are cynically assigned an AML range from a low of 20 to a high of 35, for a mean of 28 wild burros, which corresponds to **a whopping 10,020 acres per individual wild burro!** Unfortunately this cruel “joke” is very real & constitutes a blatant attack on justice in America & especially on the horses & burros themselves who possess legal rights to the principal resources in their legal areas, but find themselves being treated with “extreme prejudice.”

Outrageous irregularities also present themselves in the annual population rates of increase that the two federal agencies have reported. Take, for example, what happened between 2016 when the agencies reported just 25 wild horses here, & 2017, when the agencies reported 108 wild horses. The increase of 83 horses represents a 332% annual increase, which is impossible biologically & could only happen if wild horses were brought in from outside. Yet, this absurdity gets even worse concerning what was reported for wild burros between 2009, when the agencies reported 27 burros, and 2010, when the agencies reported 175 burros. This increase of 98 wild burros represents a 548% annual increase! Again biologically impossible! Yet, no explanations were given for these glaring discrepancies by any of the agencies! Do they count on people being so stupid or so uncaring or so lacking in gumption that they fail to insist on the greater truth & justice that is at stake here?!

Bearing this in mind, we should now examine one of the latest reported censuses for these “national heritage species.” In 2015 BLM reported 125 wild horses & 67 wild burros in the Wheeler Pass JMA. Now please visualize how an immense 2,205 acres per individual wild horse & an even more immense 4,113 acres per individual wild burro could even possibly be an “overpopulation.” By any sane view, these wild horse & wild burro densities represent a nearly wild-horse & wild-burro-empty ecosystem. These AMLs are insultingly low, token population levels for both species! It is the kind of “management” that is cynically designed for the downfall of these legally protected & publically cherished animals. This cruel travesty of justice is being perpetrated by our supposed “public servants” in spite of the horses’ &

burros' legal & natural rights to live in the Wheeler Pass JMA & the several other contiguous legal areas found in the Spring Range. This plan grievously insults the great majority of the General Public that supports these beautiful, intelligent & wise animals & their right to those portions of the public lands that were guaranteed as their habitats by the WFHBA. These are their rightful habitats from which they should not be squeezed out! Also of great importance is the proven fact that these wild horses & wild burros are major wildfire mitigators & often prevent catastrophic wildfires. This is a looming issue today due to Global Warming, & we should not overlook these equids very important role in combatting Global Warming. Also we must not forget that these equids can restore burned over areas because of their contribution of humus & intact seeds & their semi-nomadic lifestyle. For these & many related reasons, I call for these noble animals restoration in the Wheeler Pass JMA as well as in all the other BLM HMAs & USFS Territories in & around the vast Spring Mountain Range. And much the same plea can be made for wild horse & wild burro restoration throughout the West, as elsewhere. Indeed, in many enlightened countries wild equids are being used to restore degraded ecosystems.

Some of my investigations concerning the Spring Mountain Complex of wild horse & wild burro herd are described in my book The Wild Horse Conspiracy (2014 revised edition; p. 75-77). Here is one excerpt:

"... in the Spring Mountain Complex of wild horse and burro herd areas, the Las Vegas BLM District and Humboldt-Toiyabe National Forest plan to allow only one wild equid per seven-thousand-plus legal acres. Here big game and to a lesser extent livestock outnumber and out-consume the wild equids many times over ... [a]nd where most of the Spring Mountain public waters have been fenced off so that wild horses cannot access them, but game animals, such as trophy bighorn sheep, can. Though this state of affairs directly violates the Wild Free-Roaming Horses and Burros Act, the National Environmental Policy Act (NEPA), the Federal Land Policy and Management Act (FLPMA), the Public Rangelands Improvement Act (PRIA), the National Historical Preservation Act, as well as the Multiple Use and Sustainability Act, for the past approximately two decades most federal judges have blindly dismissed legal suits, including from damaged locals, e.g. National Wild Horse Association vs. BLM 2007; The Cloud Foundation, Downer and Moffat vs. Salazar et al. July 2011. Also compare Judge McKibben, Reno Federal Court ruling re: Triple B roundup injunction appeal. Here I excerpt from my letter of protest of 6/30/13 concerning the Spring Mountain Complex:

"The mathematical analysis of acres per existing individual 2013 wild horse/wild burro and proposed 2013 AML individual wild horse/wild burro reveals the gross unfairness of the proposed joint BLM/USFS plan for the Spring Mountain Complex toward the legitimate wild horse and burro populations. I have double checked these figures and they clearly reveal: (1) that the current wild horse and burro populations in the Complex are not overpopulated, but rather are still in the process of filling their respective horse or burro ecological niches in this region. Even in the drier portions of the Complex, the number of acres per individual wild horse or burro should be in the low hundreds per individual, not in the low thousands per individual (existing 2013 populations) and much less in the several thousands of acres per individual wild horse or wild burro! That the proposed Appropriate Management Levels for the enormous 784,325-acre Spring Mountains complex plans to allow for only one individual wild horse per 7,615 legal JMA ... acres and for only one individual wild burro per 5,299 legal JMA ... acres reveals the disgusting extent to which our BLM & USFS public officials are subverting the true intent and purpose of the unanimously passed WFHBA! This travesty of justice must not be allowed by a caring public! It makes a mockery of American democracy and caters to these wild equids' traditional enemies, & especially in the case of the Spring Mountains Complex, to the big game hunting interests represented

by the Nevada Department of Wildlife. This agency has traditionally sought to eliminate wild horses and burros from the state ... including its majority of federal lands and in spite of their great popularity with the general public both in [Nevada] and nationwide.” ... “As a wildlife ecologist and individual human ... I ... legally protest and challenge this proposal ... It represents a hostile betrayal both of the magnificent wild horses and burros and their freedom [as well as] of the majority of Americans – the General Public – whose Quality of Life would be grievously damaged were this shameless and deceptive plan to be ... implemented!”

During 2005, I did a study including overflight & wild [equid] census for a wild horse & burro advocacy group of southern Nevada called the “Spring Mountain Wild Horse & Burro Alliance.” [The Spring Mountain range is at least 50 miles long by 20 miles wide and rises to heights of between 10,000 & 12,000 feet.] “... [S]everal Herd Areas/Herd Management Areas for both equid species occur here; & the zeroing out or insultingly low AMLs for these legal ... herds are ... outrageous. Members of this nonprofit group & many Cold Creek residents described to me the disrespectful treatment they received from officials & those established interests that egg these officials on to do their bidding. Ecologist & Cold Creekian Dr. Greg Clark determined that almost all of the wild horses who were being targeted for removal would survive if these land managers would just leave them alone & let natural selection & ecological adaptation take their course. He emphasized that this would be the most humane as well as wise course of action & far preferable to cruelly jerking them out of their desert home & subjecting them to the trauma of separation from their family bands & herd social order, confinement, stress, disease &, as is often the case, bitter death. In fact, most gathered horses are not adopted. Only ca. 3,000 per year of the 10,000 or more wild horses who are gathered find homes, & many of these prove unsatisfactory, so the wild horses end up going to slaughter anyway. Though BLM claims the un-adopted ones go to long-term pastures, investigators, such as Animals’ Angels, report that many end up being transported over the Mexican or Canadian borders to be slaughtered in hellish plants. Mrs. Little also reconfirmed what I already knew: that it is not the wild horses but domestic sheep who transmit various deadly strains of pneumonia to the Bighorn sheep resulting in epidemics that kill the latter *en masse*. This occurs in Nevada & throughout the West. It is despicable to scapegoat the wild, naturally living horses & burros for this! Also, why are BLM & USFS ignoring the great role wild horses play in combatting Chronic Wasting Disease that affects so many big game animals like deer & elk today?!

4/29/18: Early in the morning, I enjoyed a hardy breakfast at Clark’s high-perched “eagle nest” home from which I also enjoyed commanding views over southern Nevada’s mountain ranges & valleys to the east, including Groom Lake. At 7 A.M., I struck out to see how the wild horses & their habitat were faring. First I drove up to the base of the Bonanza trail where this mighty mountain begins to rise abruptly. Then I hiked to an upper spring to find out where the mule deer, elk & horses were watering. Healthy willow bushes indicated surface or near-surface water; the riparian ecosystem appeared fruitful & intact – certainly still “functional” & not really “at risk.” Conditions were dry due to lack of rain, but not so extreme as to justify the proposed removal of all the wild horses. Again, it became clear that the horses were being targeted & their human supporters at Cold Creek & elsewhere were being extremely slighted & even denied their Constitutional rights to the “pursuit of happiness” in life, for many had chosen Cold Creek to be their home because of the wild horses & burros. If a survey established that most Cold Creekians had moved here to live near the wild horses & wild burros, a lawsuit could be brought for damages & to restore viable populations of these animals & allow them to fill their

respective ecological niches then self-stabilize according to Nature's age-old laws, not human's arbitrarily imposed ones (see my Reserve Design proposal at [www.gofundme.com/mstngreservedesign](http://www.gofundme.com/mstngreservedesign)).



*Commanding view from near Bonanza Spring above Cold Creek. Wheeler Pass JMA. May 2018. Copyright by Craig C. Downer*

A very positive conservation note is that I observed the Willow Flycatcher (*Empidonax traillii*) here alongside the wild horses. Since this is a species whose survival is “of concern,” its presence belies the official claim that wild horses are destroying the natural habitat of such sensitive species. Both male & female Willow Flycatchers are exquisite with subtle olive-green heads, backs & tails, pure white throats, light grey breasts & yellowish white lower bellies. They blend well amid the willows of the riparian habitats they favor. Public officials need to recognize that wild horse & burros build soils by contributing vital humus from their droppings & that they do this to a much greater degree than ruminant herbivores like cattle, sheep & deer. This has to do with differences in the digestive systems of post-gastric, caecal digesting equids & pre-gastric, multi-stomach ruminant herbivores. Such differences also explain how

equids disperse intact seeds in greater abundance & variety. And we must not forget that wild horses & wild burros mitigate & often even prevent catastrophic wildfires – which is of paramount concern today because of Global Warming. The recent Red Rock wildfire at the southern end of the Spring Mountains came right after the wild horse herd there had been eliminated by order of the BLM & very probably as a consequence. It contained some breathtaking palominos & was greatly appreciated by the too-often overlooked general public, including local residents, Las Vegans & many visitors – all seeking a wholesome relationship with the Greater Family of Life. In October 2008, the award winning reporter for CBS KLAS TV station, George Knapp, revealed the vital role wild horses & wild burros play in wildfire prevention in his film “Stampede to Oblivion” (available on the www).

Rhea also pointed out that officials were falsely using a rare type of butterfly as a reason to eliminate the wild horses. She & other Cold Creekians had observed these butterflies for many years & did not substantiate their being negatively impacted by either wild horses or wild burros. Again they saw how innocent horses & burros were being shamelessly used as scapegoats.

At the piedmont, I spotted a few wild horse tracks & droppings near an upper spring but certainly nothing excessive. From a vantage point & with binoculars, I was able to discern a pair of wild horses below the spring in an open area that was recovering from the 1980's “Bonanza” wildfire. They were peacefully grazing & kept frequently moving -- as prevents overgrazing of any one particular area. While watching this, I noticed a few of the butterflies flitting about them. Indeed, naturalists have long observed many mutualistic benefits between equids & a variety of organisms, including butterflies.

At 10:27 AM, I hiked back to my car parked below the spring & at the Bonanza Trailhead. Here a family of twelve were enjoying nature & preparing for a picnic. The historic Camp Bonanza had operated here for many years, but now only some of its sturdier foundations remain. Musing here at this moment, a spontaneous melody came to me that expressed this place' current mood & linked its special past history – a living history not only of humans but of all interrelated sentient beings who have dwelt & continue to dwell here.

An extensive portion of the Spring Mountain range including above Cold Creek is still recovering from an intensive wildfire in the 1980s. Unbiased observers have confirmed that the naturally living horses & burros here have significantly aided in the recovery of the burned portions of this ecosystem. As mentioned earlier, this involves their building soils & dispersing intact seeds to a greater degree than do ruminant herbivores, such as the deer, elk & bighorn sheep that occur here & which the wild equid actually complement (see Bibliography for scientific studies proving this). Ms. Little & other Cold Creekians observed that, right after this fire, Forest Service workers planted enormous amounts of Cheat Grass, though officials deny this today. This grass is of Central Asian origin & now branded as an exotic invader species. But It has spread all over the West due to ecological disruption directly or indirectly caused by people, i.e. overgrazing & trampling by livestock, disruption of soils by vehicles, etc. When it dries, it becomes explosive tinder for major wildfires that lightning bolts, campfire sparks, smokers, overheated engines, or vehicles banging on hard rocks can easily ignite.

At noon we came upon several elk & mule deer tracks & remembered that elaborate ecological studies have proven how members of the horse family actually complement these cervid as well as bovid ruminant herbivores. But we lamented the fact that this fact has been obstinately ignored by BLM & USFS bureaucracies & other de facto enemies of the wild horses & burros (see:

[https://www.researchgate.net/publication/239848265\\_Facilitation\\_between\\_Bovids\\_and\\_Equids\\_in\\_an\\_African\\_Savannah](https://www.researchgate.net/publication/239848265_Facilitation_between_Bovids_and_Equids_in_an_African_Savannah) & <https://www.princeton.edu/news/2012/02/20/wildlife-and-cows-can-be-partners-not-enemies-search-food?section=featured> ).

At 12:30 PM, we came upon a muddy spring. Large Sagebrush stands grew nearby affording shelter for wild horses & deer who came into drink but did not linger. Although wild horse enemies will claim wild horses degrade riparian habitats, it is almost always the domestic cattle who camp on, over-trample & over-graze these habitats, precisely because they are not allowed to naturally integrate with the ecosystem. The nature of the horse is to come into drink & not linger more than a modest amount of time then to head back out to its greater home range. I have observed this too many times, just as I have heard this same old whining misinformation about the wild horses many times before. It seems the wild horse enemies rely on unquestioning “yes” people who merely go along with falsehoods. And we should also bear in mind that the wild horses & burros are often squeezed into unnatural situations by overfencing of the public lands or fencing off of water sources as well as the stripping of forage by domestic livestock hordes that rape the resource & then are removed for slaughter. So let’s look at the whole story here, not at some biased individual’s or tunnel-vision group’s take on what’s happening.

Also prevalent near this spring, the “Chamise” bush represents a stage in the Bonanza wildfire’s recovery. Wild horses rub onto its small but profuse, resinous leaves to acquire a certain pungent odor that wards off biting flies & other insects. It also aides them in disguising their scent in order to evade predators, such as the puma that should occur here. What Cold Creek residents called “Chamise” I identified as a member of the Rose family of the species *Purshia glandulosa*, aka “Antelope Bush.” According to my Munz plant identification manual, it grows 1-2 m high, has “glabrous twigs prominently glandular” & occurs on dry slopes 2,800 to 9,000’ elev. It was good to see it thriving here & providing habitat for many species including birds, rodents, reptiles, & insects. We wondered whether the Forest Service & BLM officials appreciated how well this beneficial bush & its companion species were doing right alongside the wild horses. For too often the temptation of established bureaucracies & even universities is to claim to be objective yet to proceed to filter the facts &/or to twist their interpretations to suit narrow-minded, politically imposed agendas. Hence “research” comes to perversely yield obfuscation & even shameless falsehoods that are promoted by grant donors or budget providers.

As we mused together, I captured a photo (#101) of Rhea & Joel & their energetic & friendly terrier “Trigger.” We commented on the exuberant Mesquite bushes (*Prosopis juliflora*) & the Gambel’s Scrub Oaks (*Quercus Gambeli*) that were providing habitat for myriad birds, rabbits, insects, etc. Then our eyes caught sight of a steep trail taken by the introduced elk. It seemed to us that all these species, including the wild horses & burros, were falling into a special & unique harmony – if people would only let them! This area has a history of intensive cattle & sheep grazing, but since the Bonanza fire, livestock have been forbidden. A new monopoly seems to be taking livestock’s place, since the area is now managed primarily for big game hunting. For this reason, the wild horses & burros are being targeted for discrediting & eliminating in spite of this being their legal area: the Wheeler Pass Joint Management Area on both BLM & USFS lands. We lamented how our supposed “public servants” continue to ride rough-shod over “we the people” aka the “general public” by ignoring our substantial support for the wild horses & wild burros both here as elsewhere throughout the West & their wonderful, age-old contribution to the entire ecosystem, including the deer, etc.



Wild Horse Defenders & Cold Creekians Rhea Little & husband Joel. Wheeler Pass JMA. 4/29/18. Copyright by Craig C. Downer

As our walk continued, we observed somewhat dry Giant Lupine colonies (*Lupinus aridus*) growing on a rocky slope. These were both healthy & beautiful, especially those in flower. They were definitely not being overly impacted by the wild horses. Because of their root nodules, these legumes fixate Nitrogen gas into solid nitrates that enrich soils & nourish the animals who forage on them. They help the ecosystem recover in a major way; the wild horses & burros greatly aide in their propagation, because they eat them & disperse their intact seeds, giving them a well-fertilized soil bed in which to germinate. This is fact. The Horehound mint (*Marrubium vulgare*) was also prevalent with its whitish velvety "hair". Though considered a weed & originally from Europe, it has obviously found a niche here & could be fulfilling some important ecological function. Including this species, mints are commonly used medicines. Indeed, the origin of the word "mint" is from the Greek "mintha" referring to the mind; & mints have long been considered "mind sharpeners."

Rhea & Joel reminded me that the last -- & bitterly opposed -- roundup of wild horses & burros here took place in 2016 during harsh weather. This roundup caused much suffering among the wild horses & burros; & many died shortly thereafter as a consequence, though officials touted the roundup as a "rescue." To renew our good cheer, we noticed a desert lily whose full blossom perfectly faced the sun. Also some volcanic glass sparkled & glistened up from the ground. We also noticed the droppings of a colt & began to celebrate the renewal of this mustang herd, until we remembered the planned roundup that might soon take place. I learned from several Cold Creekians that many of these wild horses, in earlier years, had been trailered in by BLM contractors in order to justify roundups. In other words, BLM was claiming they were here when in fact their own & illegal gathers had nearly eliminated them.

According to these sources, some of these were brought in from the Johnnie HMA in the northern Spring Mountain range so that BLM contractors could have some animals to roundup, or “gather,” as they prefer to call what they do.

Other species we observed included the Prickly Pear cactus (*Opuntia erinacea*), which is common in the Great Basin especially in drier areas, & extends far to the north. Its sweet but thorny fruit, the *tuna*, is eaten by many species, including us people.

At 1:30 PM, the temperature shot up to 70 deg. F. & we noticed a dark hawk soaring high overhead. I was pleased to see it was the Swanson’s Hawk (*Buteo Swainsoni*). This is a migratory hawk that I had observed also in the Colombian Andes during my Peace Corps wildlife ecologist days. We continued to observe an abundance of healthy grass of appropriate species for wild horses as well as other plants eaten by deer, elk, horses, rabbits, etc. There was plenty of forage to go around for all the herbivores here; & the wild horses were, in fact, helping this happen in many time-tested ways. They were contributing positively to the landscape’s restoration after the Bonanza wildfire while helping to prevent more major wildfires like this. By observing closely, we could see that the horses’ droppings were subtly incorporating into the soils, making these more nutrient rich & water-retentive & as a consequence, supporting a greater variety of plants and animals & increasing water tables, i.e. subterranean aquifers. Often little dung beetles appeared rolling portions of horse dung far away from the original site of deposition. Nature’s benign & intricate relationships reveal an all-encompassing wisdom at work.

At 1:54 PM, four dark brown mustangs showed up, & I was able to take some nice pictures of them against the scenic backdrop of Spring Mountain, including the 10,397’ Bonanza Peak. They were in healthy condition with estimated Henneke scores of 4 (moderately thin) to 5 (Moderate). And with Spring greenup, they were getting even more fit. But they displayed an unexpected nervousness, as though aware of the federal government’s plans to eliminate them from their natural home. Based on trumped up charges, such plans throughout the West are now proceeding at a terrifying pace & involve a shameless misinformation campaign to portray the wild equids as merely destructive exotics, as misfits who need “heroes to rescue them from starvation.” And thus it is that the perpetrators of these crimes against our wild horses & burros seek to be praised as rescuers. The hypocrisy involved here is extreme!

My guides invited me to a hearty mountain lunch after which I visited another area frequented by a wild horse band on the lower east side of Cold Creek. This town is named for a stream that gushes from the Spring Mountain, bearing abundant, clear & cold water that sustains wild horses, elk, deer, rabbits, mountain lions, coyotes, birds, insects, invertebrates, myriad plants & microorganisms & even us people (see photos). It is year-round, flowing from deep within the awesome mountain even during the hottest months. From this water, a series of ponds have been created to assure year-round water for wildlife, which disproves the official claim that there is insufficient water for the wild horses & that they need to be rescued from drought. Tragically, right after I returned home, in a massive operation, the BLM & USFS captured & removed all but a few bands of the wild horses from their natural home here to which they were contributing so harmoniously. Their doing so was the true fulfillment of the WFHBA where it states that the wild horses “... contribute to the diversity of life forms within the nation and enrich the lives of the American people ... [and] are to be considered in the area where presently found [1971 as year-round habitat] as an integral part of the natural system of public lands.” The removal occurred in spite of the vigorous objection by many Cold Creekians & others who came regularly to visit the herd.

And it has caused terrible anger & depression among many individual people who honored, enjoyed & even loved the individual horses whose rightful home the Wheeler Pass JMA was & still is!

And so we of alive conscience on this vital issue continue our journey in life lamenting that bitter but so often encountered fact concerning so many thoughtless established powers today: “There are none so blind as they who will not see!” And I might add: “ ... so deaf as they who will not listen!”

Late that afternoon, I again showed my slide program depicting America’s last remaining wild horses & burros to an interested gathering. I promised the sympathetic Cold Creekians & visitors that I would contact the Forest Service & BLM officials & urge them to cancel their planned removal of the relatively few wild horses remaining in this awesome area. Lamentably my calls & letters were met with one of the most flagrant examples of spiteful rudeness that I have ever encountered from a public official ... in this case the Forest Service lead official for the JMA. He was clearly “riding rough-shod” over the lives of the harmonious, naturally living horses & the nature-loving people here & in the process ignoring the implementation of true “multiple use” on our public lands.

On my way back through the dark Nevada night, I felt overseen by the teaming bright stars above me, as plenty of time & space caused me to contemplate all of the vast, alluring & species-rich natural areas of Nevada & the rest of the West -- including their amazing mustang & burro herds. Throughout my life, it has been a real honor to experience glimpses of these equids just being more truly themselves in their natural & ancestral homes here in North America, their cradle of evolution.

The public hearing in Cold Creek took place a few days after I left. Here major opposition was voiced & sound reasons for leaving the wild horses alone were presented. But, as expected, smug “know-it-all” officials only ignored the ardent wild horse defenders & their legitimate complaints & proposals. Shortly after the public hearing they perfunctorily proceeded with their outrageous roundups.

### **Closing Statement**

Is there any way to positively change the egregious status quo & restore the wild horses & burros at viable levels to their rightful, viably-sized natural homes in Cold Creek & all the other unique & amazing ecosystems that I have visited & described in this report & similar herds & habitats elsewhere? There has to be! For to abandon this wholesome cause is no sane option! These unique sentient beings are depending upon those of us who still – or may yet – possess the mental clarity, emotional soundness & the strength of will to do something truly worthwhile in this world today! And if in this honorable endeavor & the journey upon which it takes us, times come when we need a boost, an inspiration, then we have to look no further than to these ancient yet ever youthful & self-renewing presences, these life restorers who are the horses & burros themselves & to consider all that they have suffered, yet still endured. For they are our exemplars par excellence, our inspiration to truly “see” what All of Life can yet become – & to believe in this & make it happen!

\*\*\*\*\*



*Proud & Free lone mustang walks contemplatively on. Below Cold Creek with vast Nevada desert valleys & ranges to east. Perhaps he meditates upon his precarious future & that of his kind. Wheeler Pass JMA. May 2018. Copyright by Craig C. Downer*

## **BIBLIOGRAPHY**

Animal Welfare Institute. 2012. <https://awionline.org/sites/default/files/uploads/documents/AWI-WL-FinalWildHorseandBurroReportWithStateMaps10-26-12.pdf>

\_\_\_\_\_. <https://awionline.org/content/wild-horses-native-north-american-wildlife>.

\_\_\_\_\_. 2007. Managing for Extinction: Shortcomings of the Bureau of Land Management's Wild Horse and Burro Program. Washington, D.C. (Available online.)

Audubon Society (The). Various years. Field Guide to North American Wildflowers, Western Region. Field Guide to North American Butterflies.

Bell, R.H.V. 1970. The use of the herb layer by grazing ungulates in the Serengeti. *IN*: Watson, A. Ed. Animal Populations in Relation to their Food Choice. British Ecological Society Symposium Proceedings, Blackwell, Science Publications, Oxford, England.

Bureau of Land Management. <https://www.blm.gov/programs/wild-horse-and-burro/about-the-program/program-data>. Also .../herd-management/herd-management-areas.

Berger, J. 1986. Wild Horses of the Great Basin: Social Competition and Population Size. U. of Chicago.

Cloud Foundation (The). <https://www.thecloudfoundation.org/visit-a-herd>

Dickard, M. et al. 2015. Riparian area management: Proper functioning condition assessment for lotic areas. Technical Reference 1737-15. USDI-Bureau of Land Management, Nat. Operat. Center, Denver.

- Downer, Craig C. 1977. Wild Horses: Living Symbols of Freedom. Western Printers & Publish., Sparks, NV
- \_\_\_\_\_ 2005 (Dec.). Wild and Free-Roaming Horses and Burros of North America: Factual and Sensitive Statement – How They Help the Ecosystem. *Natural Horse* 7(3): 10 – 11.
- \_\_\_\_\_ 2010 (Sept.-Oct.). Proposal for Wild Horse/Burro Reserve Design as a Solution to Present Crisis. *Natural Horse* 12(5): 26 – 27.
- \_\_\_\_\_ 2014. The horse and burro as positively contributing returned natives in North America. *American Journal of Life Sciences* 2(1): 5 – 23.
- \_\_\_\_\_ 2014. The Wild Horse Conspiracy. <https://www.amazon.com/dp/1461068983> (for ebook use B009XJ64P4) or for signed copy go to <https://thewildhorseconspiracy.org>
- \_\_\_\_\_ 2015. Reserve Design Project Proposal for Wild Horses & Wild Burros. Project description & funds request at <https://www.gofundme.com/mstngreservedesign>
- \_\_\_\_\_ 2016 (Sept. 24). Will There be a Healthy Future for America’s Wild Horses and Burros IN THE WILD? <https://www.thewildhorseconspiracy.org/2017/03/18/will> there be
- \_\_\_\_\_ 2016 (Sept. 10). Response to Ben master’s justification of drastic measures toward America’s last wild horses and burros. <https://www.facebook.com/notes/craig-downer/response-to-ben-masters-justification-of>
- \_\_\_\_\_ 2017. America’s Wild Horses and Burros Must Make a Comeback! Contact [ccdowner@aol.com](mailto:ccdowner@aol.com) for copy.
- \_\_\_\_\_ and Johnston, Jesica. 2017 (March). Northern California and Nevada Border Twin Peaks Wild Horse and Burro Herd Management Area Aerial Population Survey. April 3, 2016. Link: [https://www.thewildhorseconspiracy.org/wp-contact/uploads/2017/03/TwinPeaks\\_Flight\\_Report\\_FINAL-4.3.16.pdf](https://www.thewildhorseconspiracy.org/wp-contact/uploads/2017/03/TwinPeaks_Flight_Report_FINAL-4.3.16.pdf)
- Duncan, P. 1992. Zebras, Asses and Horses: An Action Plan for the Conservation of Wild Equids. IUCN Species Survival Commission, Equid Specialist Group. Gland, Switzerland.
- Edge of Existence. <https://www.edgeofexistence.org/species/species-categories/mammals>
- Exmoor 4 all. <https://exmoor4all.com/news/>
- Farley, T. 2015. Wild at Heart: Mustangs and the Young People Fighting to Save Them. Houghton :Mifflin Harcourt, Boston & New York.
- Fite, Katie. 2010. Katie on Calico. <http://americanherds.blogspot.com/2010/01/katie-on-calico.html>.
- Forsten, Ann, Ph.D. Mitochondrial-DNA timetable and the evolution of *Equus*: comparison of molecular and paleontological evidence. *Ann. Zool. Fennici* 28: 301-309.
- Gersick, A. & Rubenstein, D. 2017. Physiology modulates social flexibility and collective behavior in equids and other large ungulates. *Phil. Trans. Royal Soc. Brit. Bio. Sci.* 372. 20160241
- Google. <https://sites.google.com/site/coyotecanyonheritageherd/>
- Gregg, K; LeBlanc, L.; & Johnston, J. 2014. Wild Horse Population Growth. <http://rtfitchauthor.com/2014/04/28/report-wild-horse-population-growth>

Hudak, Mike. 2007. *Western Turf Wars: The Politics of Public Lands Ranching*. Biome Books, Binghamton, New York.

Holmgren, Erick, Ph.D. 2016. *Secret Lives of Well-Digging Burros*.

<https://www.horsetalk.co.nz/2016/06/05/secret-lives-well-digging-burros/#1X224cVPouPu2> see also: <https://youtu.be/HQAK7FIGCJA> and .../97WNOIJ9yoY and .../watch?v=xf7vjt4/ZoE

Horsetalk. <https://www.horsetalk.co.nz/2018/01/08/fire-grazing-wild-horses-better-cattle/>  
<https://www.horsetalk.co.nz/2017/09/25/evolution-wild-horses-cattle-effect-range-damage/>

IUCN (International Union for Conservation of Nature aka World Conservation Union).

<https://www.iucn.org/content/wild-horse-released-western-iberia-rewilding-area>

Johnson, C.N. 2009 (July 22). Ecological Consequences of Late Quaternary Extinction of Megafauna. *Proceedings Royal Society (Britain)*. *Biological Science* 276(1667): 2509 – 2519 (JSTOR).

Klingel, Hans. 1979. A Comparison of the Social Organization of the Equids. A Comparison of the Social Organization of the Equids. *In: Symposium on the Ecology and Behavior of Wild and Feral Equids. Proceedings: University of Wyoming, Laramie. Sept. 6-8, 1979.*

Krause, B. 2012. *The Great Animal Orchestra: Finding the Origins of Music in the World's Wild Places*. Little, Brown and Company, Boston.

Live Science. <https://www.livescience.com/9589-surprising-history-America-wild-horses.html>

MacFadden, B.J. 1992. *Fossil horses: Systematics, paleobiology, and evolution of the family Equidae*. Cambridge University Press, England.

MacPhee, R., Ph.D. 2013. *The Wild Horse is Native to North America*.

<https://www.thecloudfoundation.org/reading-room-faq-s-article/wh-ref>.

Moehlman, P.D. , Editor. 2002. *IUCN SSC Equid Action Plan*. IUCN, Gland, Switzerland.

Munz, P.A. with Keck. D.D. 1963. *A California Flora*. University of California Press, Berkeley.

Naundrup, P.J. and Svenning, J.C. 2015. A Geographical Assessment of the Global Scope for Rewilding with Wild-Living Horses (*Equus ferus*). *PloS one* 10(7), e0132359. Doi: 10.1371/journal.pone.0132359.

Oddity Central. <https://www.odditycentral.com/news/ejiao-the-chinese-miracle-cure-decimating-the-worlds-donkey-population.html>.

NCBI. <https://www.ncbi.nlm.nih.gov/pmc/articles/PM6281800>

PEER. [https://www.peer.org/assets/docs/whitepapers/1997\\_horse\\_to\\_slaughter.pdf](https://www.peer.org/assets/docs/whitepapers/1997_horse_to_slaughter.pdf)

Peterson, Roger Tory, Editor. Various years. *Peterson Field Guides*. *Western Birds* (R.T. Peterson, author). *Western Reptiles and Amphibians* (R.C. Stebbins, author). *Animal Tracks* (O. J. Murie, author). *Mammals* (W.H. Burt & R.P. Grossenheider, authors).

Ransom, J.J. *et al.* 2010. Influence of immunocontraception on time budgets, social behavior, and body condition in feral horses. *Applied Animal Behavior Science* 124: 51 – 60.

Research Gate.

<https://www.researchgate.net/publication/321932431> Complementing endozoochorous seed dispersal patterns by donkeys and goats in a semi-natural island ecosystem

<https://www.researchgate.net/publication/239848265> Facilitation between Bovids and Equids in an African Savanna

<https://researchgate.net/publication/318167799> Can integrating wildlife and livestock enhance ecosystem services in central Kenya

<https://researchgate.net/publication/318163234> Pleistocene megafaunal extinction and the functional loss of long distance seed dispersal services

<https://www.researchgate.net/publication/267285340> Reintroduced species as vectors for seed dispersal

<https://researchgate.net/publication/223716446> Endozoochory by free ranging large herbivores: Ecological correlates and perspectives for restoration/

<https://researchgate.net/publication/223007520> Horse dung germinable seed content in relation to plant species abundance, diet composition and seed characteristics

Retrieverman. 2015. <https://retrieverman.net/2015/02/26/are-the-bonaire-donkeys-the-last-wildnubian-asses/#comments>

Ripple, W.I. *et al.* 2015. <http://advances.sciencemag.org/content/1/4/e1400103.full.pdf>.

Rutgers University. [https://esc.rutgers.edu/fact\\_sheet/horses-and-manure/](https://esc.rutgers.edu/fact_sheet/horses-and-manure/)

Ryden, H. 1999. *America's Last Wild Horses*. The Lyons Press, New York, N.Y.

Salt River Wild Horse Management Group.

<https://saltriverwildhorsemangementgroup.org/faqs/value-of-wild-horses-and-burros/>

Smithsonian Magazine. <https://www.smithsonianmag.com/science-native/remarkable-comeback-przewalski-horse-180961142/>

Spruce Pets. <https://www.thesprucepets.com/horse-manure-facts-1887394>

Stillman, D. 2008. *Mustangs: the Saga of the Wild Horse in the American West*. Hough.-Miffl. Co, Boston.

Taylor, R.J. 1992. *Sagebrush Country: A Wildflower Sanctuary*. Mountain Press Publishing Company, Missoula, Montana.

Trimble, S. 1999. *The Sagebrush Ocean: A Natural History of the Great Basin*. Univ. of Nevada Press.

Turner, J.W., and Morrison, M.L. 2001 (June). Influence of Predation by Mountain Lions on Numbers and Survivorship of a Feral Horse Population. *The Southwestern Naturalist* 46(2): 183 – 190.

United States Geological Survey, *et al.* 2005. Interpreting Indicators of Rangeland Health. Technical Reference # 1734-6. Version 4.

Wild Equus. 2015. <https://wildequus.org/2015/07/29/namibia-desert-horses-we/>

Wolfe, Jr., M.L. 1980. Feral Horse Demography: A Preliminary Report.  
<http://www.jstor.org/stable/3897882>

Wuerthner, G. and Mollie, M. Eds. 2002. Welfare Ranching: the Subsidized Destruction of the American West. Island Press, Washington, D.C.

Yocom, C., Brown, V. & Starbuck, A. Wildlife of the Intermountain West. Naturegraph Books, Happy Camp, California.

Zimov, S.A. 2005. Pleistocene Park: Return of the Mammoths' Ecosystem. *Science* 308: 796 – 798. See also <http://www.pleistocenepark.ru/en/>

\_\_\_\_\_ *et al.* 1995 (Nov.). Steppe-tundra transition: a herbivore-driven biome shift at the end of the Pleistocene. *The American Naturalist* 146(5): 765 – 794.