

Summer  
2020  
Edition 40: 2

# Tortoise Tracks

Newsletter



Celebrating 45 Years  
of Desert  
Conservation

## Remarks on the Anniversary of the Desert Tortoise Preserve Committee

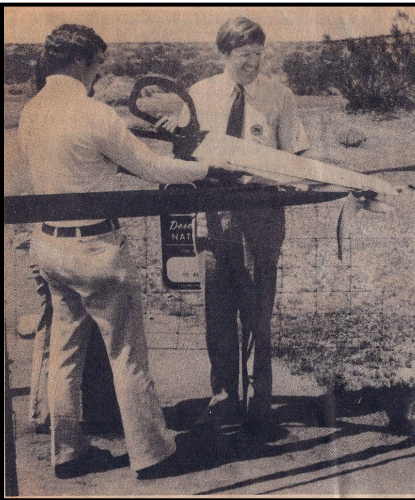
### By Founding Board Member Dr. Kristin Berry

In the early 1970s, I realized that no protected place existed for desert tortoises in the western Mojave Desert. Having grown up at China Lake, north of the Natural Area, the desert was a part of my life--the wildflowers, the wide expanses of land and views, and of course the tortoises, lizards, and other wildlife. So, I looked for a place with prime habitat and high population densities of tortoises, rich in wildflowers and relatively undisturbed by the growing use of recreational vehicles. Yes, I had a vision of land protected for tortoises in perpetuity, and for others to experience what is so important for all of us, a wild place where wild animals thrive.

After learning that the U.S. Bureau of Land Management administered most non-private lands with suitable habitats where tortoises were abundant. I approached District Manager, Lou Boll, of the Bakersfield District about setting aside prime land for tortoises in the Fremont Valley and Rand Mountains, eliminating sheep grazing, vehicle use, and mining exploration. After much discussion and obtaining required letters of support from professors, universities and other sources, the Bureau agreed to set aside a township or 36 square miles in the checkerboard of mixed public and private lands. We recognized that acquiring the private inholdings would be a challenging, long-term effort. By fall of 1973, the site was identified in a published BLM management plan. The set aside lands were a beautiful place, abundant with wildflowers and tortoises, where, if you were there at the right time of day in spring of a good wildflower year, you could see several tortoises, often at once.



Picture from 1978 Los Angeles Times article highlighting the Preserve, work by Dr. Berry and additional land purchased through work of the Nature Conservancy and the DTPC. From the DTPC archives.



Bureau of Land Management State Director James Ruch (left) and Congressman Bill Thomas at the ribbon cutting ceremony officially opening the Preserve. From the DTPC archives.

During those early years, the Desert Tortoise Preserve Committee formed with a goal of spearheading a Desert Tortoise Preserve, drawing on residents from Boron, California City, Bakersfield, and Ridgecrest for the Board of Trustees. Over the course of a few years, with Lou Boll and the Committee in close coordination, the BLM obtained funds for the fence to keep out sheep and vehicles, and for construction of the interpretive kiosk, access road, and other facilities. In spring of 1980, we celebrated the formal designation of the Desert Tortoise Research Natural Area by Congress, in a ceremony at the Natural Area. None of this would have happened without the initial request to Lou Boll and former State Directors, Russ Penny and Ed Hastey, as well as the change in direction for public lands that came with passage of Federal Land Policy and Management Act in 1976. The Committee played a major role in establishing the Natural Area, created a massive outreach program, stimulated the BLM to construct the protective perimeter fence, prepared the panels for the kiosk, and raising funds for a fence and land acquisition.

This spring, 40 years after the initial celebration, we planned to celebrate the combined accomplishments of the BLM and Desert Tortoise Preserve Committee by replacing the old educational panels with new panels, full of the latest information about tortoises, habitat, and other animals so important to the western Mojave ecosystem.

Laura Stockton spearheaded development of the panels with assistance from Rachel Woodard and me. We prepared the subject matter and the artist developed the artwork for the panels. We are fortunate to have such a long-term partnership with the Bureau of Management and the many volunteer services provided by Committee members.





Dedicated to the recovery and conservation of the Desert Tortoise (*Gopherus agassizii*) and other rare and endangered species inhabiting the Mojave and western Sonoran deserts.

**The  
Desert Tortoise  
Preserve Committee, Inc.**  
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Tortoise Tracks is published  
four times a year.

Cover photograph by B. Slabach

## A note about this issue

On Sunday, March 29th we had planned to assemble at the Desert Tortoise Research Natural Area in California City, for a day of celebration including our dedicated board, members, and volunteers. New educational panels were to be unveiled, nature hikes were to be taken, and conversations of accomplishments completed and goals moving forward were to be had. Yet due to the global pandemic, this celebration needed to be postponed. So we decided to bring the celebration to you! In this special edition of Tortoise Tracks you will find remarks by founding member Dr. Kristin Berry and DTPC President Ron Berger about our history, accomplishments, and goals moving forward. We have included the content from our beautiful new educational panels - subject matter prepared by board members Dr. Kristin Berry, Laura Stockton, and Rachel Woodard, and artwork by Chris Barela - for your viewing. We are looking forward for everyone to see these new panels in person at the Natural Area very soon! We hope you and yours are safe and healthy during these uncertain times.



## Land Monitors Needed - Help Us Manage Our Lands!

We are still seeking land monitors for our 2020 season to assist with our annual monitoring efforts. Monitoring will occur primarily during cooler months (October – Dec.) and can occur during weekdays or weekends. We will provide all training necessary. We guarantee you'll have a fun, productive time and the work you do will be of unquestionable value! If you are interested in any of the above opportunities please contact our Preserve Manager, Dr. Slabach at [dtpc@tortoise-tracks.org](mailto:dtpc@tortoise-tracks.org)

## Our 2020 Photography Contest

Our 2020 Photography Contest is still on with monetary awards for the best photos in six categories: Desert Tortoises, Landscapes, Close-up Flowers, Other, Birds, and Mojave Ground Squirrels. The following are requirements: the photograph must be taken on the Desert Tortoise Research Natural Area, with 600 dpi (higher preferred), and provided by electronic mail in .jpg format as single photos or as a collection in a zip file to [photocontest@tortoise-tracks.org](mailto:photocontest@tortoise-tracks.org) by June 10, 2020.

## A Message from our President Ron Berger

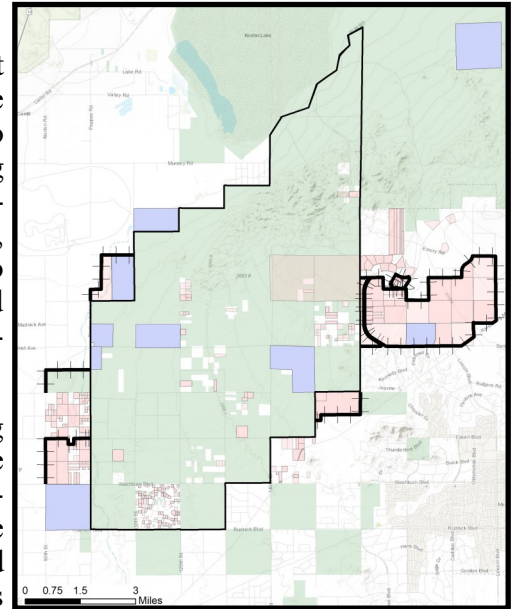
What unusual times we live in! Times none of us have any reasonable experience dealing with, or frame of reference for. I write this piece on Sunday, March 29<sup>th</sup>, the very day I was planning on welcoming you to the DTRNA for our 45<sup>th</sup> Anniversary celebration. We debated long and hard about how we would handle the crowd – where we would park all of your cars, and similar logistics issues. Instead, BLM has ordered the DTRNA shut down, and I'm 'sheltering-in-place' per the Governor's orders. So, we're publishing this newsletter. And what follows is an edited version of the remarks I would have delivered on March 28<sup>th</sup> at our Annual Meeting. See you all next year. Stay safe.

### Remarks regarding our anniversary:

The DTPC was founded in 1974 to promote the welfare of the Desert Tortoise in its native wild state in the southwestern U.S., to establish one or more preserves where habitats and ecosystems will support it, and to provide and disseminate information, education and research regarding ecosystems critical to the Desert Tortoise and associated plant and animal species. These have grown to include the Mohave Ground Squirrel, the Barstow Woolly Sunflower and the Burrowing Owl. Our mission also includes developing and implementing programs for the preserves, and fostering and publicizing the uses of these preserves for recreation, research, education and conservation.

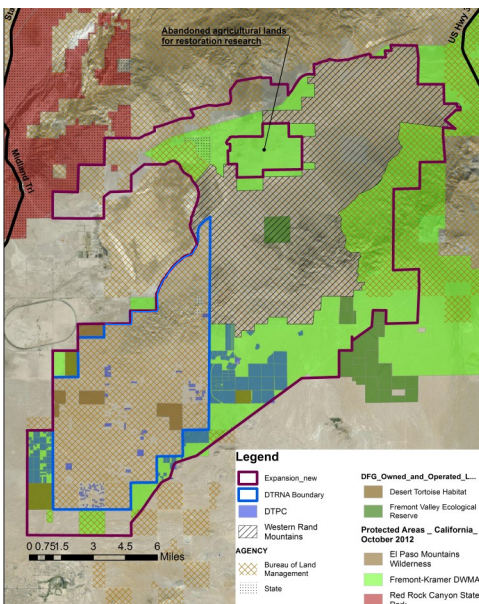
We are very proud of the work we have accomplished, chief among which is, with the tremendous help and ongoing support of BLM, the creation of and the building of the Natural Area, a place where the tortoise is protected by our fencing, signing and monitoring. In 1972, the Natural Area was comprised of 1,280 acres and by 1992, it had expanded to 25,568 acres. By 2002, to 27,944 acres and currently, including areas adjacent to the DTRNA, to 29,991 acres (map to right).

Let's discuss a few major issues we face in protecting the tortoise. Climate change represents a challenge. Therefore, in 2015, your Board created a map showing how we might, with the help of BLM, CDFW, donors and friends, expand the Natural Area to include connecting corridors



The Desert Tortoise Research Natural Area with Bureau of Land Management Properties (green), California Dept. of Fish and Wildlife (purple), and DTPC properties (pink). DTPC additional fencing is depicted by the thick black lines.

to cooler areas for tortoises, Mohave ground squirrels, and other threatened or endangered species (map below).



Map of expansion area (outlined in purple) including the established Natural Area (outlined in blue).

At our last annual meeting, I described how we are all aware of the explosive growth in raven populations, particularly in the California desert, and of the impact this has had on desert tortoise populations. Let's be abundantly clear – our opinion is that ravens may be and quite likely are the single most prolific killers of JUVENILE desert tortoises. I told you that The Coalition for a Balanced Environment (CBE) was formed in late 2015. Its primary goal is to accelerate raven management and control efforts in the California desert to preserve the diminished desert tortoise population. The CBE works to build awareness of the issues, and to accelerate enforcement of existing local raven management ordinances. CBE's objectives are: to reduce human subsidies associated with raven population growth, accelerate raven management and control, and advocate for changes in federal and state laws to permit active raven population control measures. Some time ago, we received a letter of support from then Lieutenant Governor Gavin Newsom.





I am proud to tell you that your DTPC imagined, conceived, funded and launched the CBE. We seek other organizations to join our effort. I'm pleased to report that the Desert Tortoise Council joined DTPC as a CBE member, awarded the CBE a grant and, in 2018, recognized us with the James A St. Amant Special Award for our 'outstanding leadership'. CBE's members today include: The Turtle Conservancy, The Living Desert in Palm Desert and The Nature Conservancy nationally.



On Saturday, February 15th, I was privileged to join Tom Egan of Defenders of Wildlife and a group of others on a 90 minute flight over DTRNA, Red Rock Canyon State Park, and surrounding areas. I must share with you that observations made on this trip have affected me deeply, and will surely alter my views as to the action steps which must be taken to protect the tortoise, Mohave ground squirrel, burrowing owl and other desert inhabitants. I will share with you Tom's comments (made public on social media) on our observations below.



*"What's different about these pictures? The first, on the left, is intact desert tortoise habitat protected within the fenced and patrolled Desert Tortoise Research Natural Area. The second, on the right, is highly degraded critical habitat designated by the U.S. Fish and Wildlife Service for the desert tortoise within the Rand Mountain Area of Critical Environmental Concern managed by the U.S. Bureau of Land Management, located immediately to the north.*

*The one place in the entire Mojave portion of the California Desert where secure, protected reproduction of the threatened desert tortoise is occurring and where USFWS-developed recovery objectives under the Endangered Species Act are being met, is the Desert Tortoise Research Natural Area and on public lands managed by the Desert Tortoise Preserve Committee in partnership with the U.S. Bureau of Land Management north of California City. And importantly, its not even designated as critical habitat for this imperiled species! How has this been accomplished? By getting rid of unauthorized off-road vehicle use and eliminating cattle and domestic sheep grazing by installing fencing.*

*BLM is charged with recovering threatened and endangered wildlife. The use of a critical habitat designation is intended to inform the involved federal agency with respect to how to authorize uses of our public land that further recovery of listed species like the desert tortoise, to a point where it can be removed from its protective listing. Out of six critical habitat units in the California Desert, only one, the Chuckwalla Bench, is considered relatively stable, barely holding its own in the face on impending climate change impacts to its way of life. And again, the only place where secure, protected tortoise reproduction is occurring is the Natural Area.*

*On the other side of the spectrum, the tortoise population within the Fremont-Kramer critical habitat unit designated for desert tortoise, which is located north and east of California City and the Natural Area (such as the Rand Mountains-Fremont Valley Area of Critical Environmental Concern), has been analyzed extensively by Defenders. It appears from this analysis that our state reptile, Agassiz's desert tortoise, will be extirpated (GONE) from the wild within the Fremont-Kramer unit, in 20 years. This is not rocket science. With this research and predicted future outcome in mind, Defenders believes the classification/status of Agassiz's desert tortoise should be upgraded to **ENDANGERED**, within the western Mojave Desert at the very minimum."*

Recently, our very own DTPC joined the Desert Tortoise Council and Defenders of Wildlife in a petition to change the status of the Agassiz's desert tortoise in California from its current 'Threatened' to 'Endangered'. We view this as an essential step towards increased public awareness and protection of the tortoise.

Tom Egan forecasts that desert tortoise will be functionally extinct in 20 years. Sadly, it may be so today. In a not yet published study performed by the U.S. Fish and Wildlife Service, which they will qualify endless ways a number of 3D created techno-torts were loaded with transmitters and sensors. They were placed in random locations in the Fremont-Kramer Critical Habitat Area. After one year, they found that "[r]aven interaction with techno torts indicated that juvenile tortoises have a 1 in 3 chance of being 'visited' (which likely equates to [being] preyed upon) by a raven EACH WEEK, and that...will reduce a population of 1,000 juvenile tortoises to zero in 40 weeks." In conclusion, the US Fish and Wildlife Service concludes that the likelihood that any juvenile tortoise in the wild or at least at Fremont-Kramer, will survive even one year, is less than zero! In other words, a desert tortoise might survive another 50 or 100 years, but like Lonesome George, he or she will be alone, unable to find a mate, and even if it does, unable to see its eggs ever turn into adults.

We simply can't allow this to happen. On multiple fronts, OHV, ravens, sheep grazing, invasive species, we – the DTPC – are actively engaged in solutions that, taken together, will turn this situation around. Please understand when we keep a number of our initiatives confidential because many of these would likely be undermined by forces on the other side. Please help us. We need support – volunteers – capital – and most especially donations to our permanent endowment. Please help where and if you can. To accomplish our objectives, to grow the Natural Area, to stop the ravens, etc., we have mounted an ambitious fundraising program which, with your generous support, is raising the funds needed to acquire, fence, protect and manage the expanding Natural Area.

We are a large land owner and land manager and steward, but we are a small, cash poor organization. Today, however, thanks to the generosity of our board, our members, our friends and most importantly you, we have grown our permanent endowment from a modest \$5,000 in 2015, to over \$317,000! Our goal is to grow the permanent endowment to \$5 million and higher. At \$5 million, even at 3% interest; the endowment would generate \$150,000 annually, covering roughly half our annual operating budget. But equally as important a contribution you could make to this organization and the important work that we do, would be to refer or sponsor 3, 4, 5 or more friends that are not yet members to join us and become members just like you. We need new blood – and whatever you can do to get the word out is very welcome and most appreciated. In addition to raising capital, we are regularly reaching out to private land owners who own properties in the 'expansion area', to see if they might donate their lands to us.

## Spring Work Party

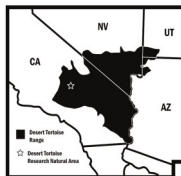


On Saturday, March 14, nineteen volunteers gathered at the DTRNA for our spring work party. Volunteers worked to clear trails, clean up the kiosk and parking area, and assist in a variety of other necessary maintenance tasks. We were greeted by two tortoises as well! A juvenile and adult both came out to enjoy the sun which was a wonderful welcome site.

Volunteers drove a total of 4,228 miles to participate and included long-time and new volunteers. Overall it was a wonderful day of stewardship! Special thanks to volunteers Judy Fair-Spaulling, Craig Bansmer, Bonny Ahern, John Krafczyk, Linda Huffman, and Michael Thamann for their assistance in planning and preparation.



# Our Redesigned Educational Kiosk Panels

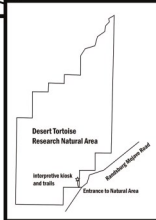


## At home in the desert

Desert tortoises (*Gopherus agassizii*) live in the Mojave and Colorado deserts in southeastern California, southern Nevada, a limited area in southwestern Utah, and a small area in northwestern Arizona. The Colorado River marks the boundary.

## Desert Tortoise Research Natural Area

The Bureau of Land Management, with the assistance of the Desert Tortoise Preserve Committee, Inc., formally established the Desert Tortoise Research Natural Area in 1980 to protect the highest known density of desert tortoises and prime habitat in the western Mojave Desert. The Natural Area covers 40 square miles of intact habitat and more habitat has been set aside along parts of the western and eastern boundaries in recent years (not shown on the map).



## Population declines

Studies by the U.S. Fish and Wildlife Service and the U.S. Geological Survey indicate that populations are in severe decline throughout the desert. Tortoises are lost through illegal collecting, shooting, disease, trampling by livestock, crushing by recreation vehicles and when crossing roads, and predation. Habitat is degraded, burrows, and food are lost from many human-related activities.



## Protected and threatened with becoming endangered

The desert tortoise is a threatened species under the federal Endangered Species Act and the California Endangered Species Act. The tortoise is also California's State Reptile. State and federal laws prohibit collecting, handling, harassment, and harm. Release of captive tortoises is also prohibited. The remains of dead tortoises cannot be collected.

## Population improving

Populations of tortoises within the Natural Area experienced declines beginning in the 1980's but showed signs of recovery in 2012, because the Natural Area is protected from harmful uses by a boundary fence. Unlike most of the geographic range, populations here are substantially higher than elsewhere.



## SPRING

In March desert tortoises emerge from hibernation and forage for food. Clutches of eggs are laid in spring and summer. The only clutch in a dry year will be in spring.



## SUMMER

From May through July, the female usually lays eggs in the tunnel of the burrow. She digs a nest for 1 to 10 ping-pong ball sized eggs.

After incubation for 67 to 104 days, the silver dollar-sized hatchlings break out of the eggs and dig to the surface. Their yolk sacs provide nourishment after hatching. Few, if any hatchlings survive because of predation.

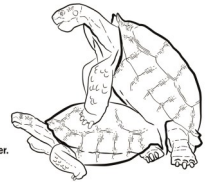


## FALL

Mating occurs in late summer and early fall.

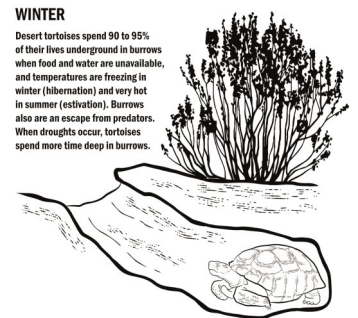
Tortoises usually become adults at 17 to 21 years, but frequent droughts can extend the time.

Hibernation begins in October.

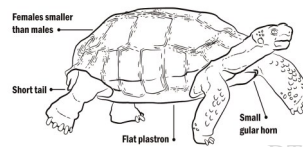


## WINTER

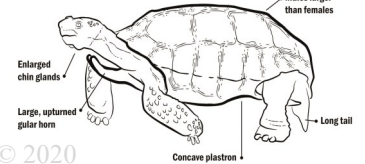
Desert tortoises spend 90 to 95% of their lives underground in burrows when food and water are unavailable, and temperatures are freezing in winter (hibernation) and very hot in summer (estivation). Burrows also are an escape from predators. When droughts occur, tortoises spend more time deep in burrows.



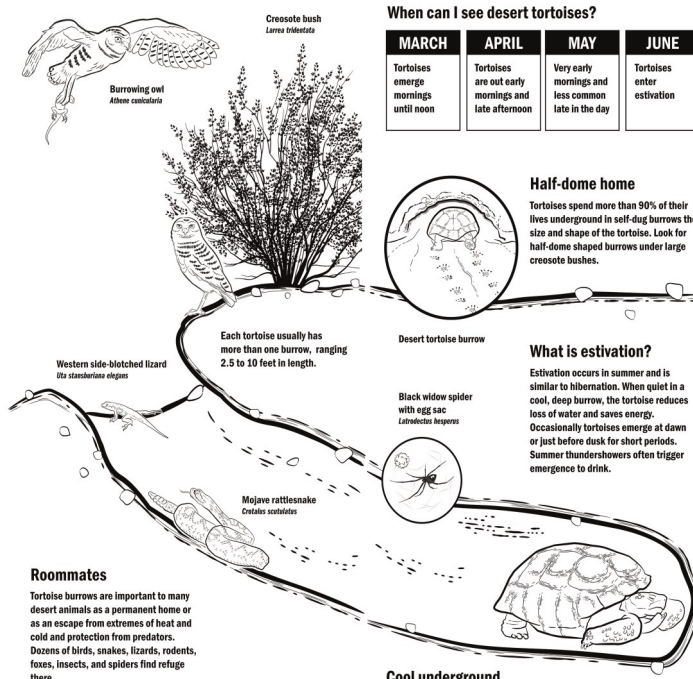
## Female



## Male



DTPC © 2020



## When can I see desert tortoises?

MARCH	APRIL	MAY	JUNE
Tortoises emerge mornings until noon	Tortoises are out early mornings and late afternoon	Very early mornings and less common late in the day	Tortoises enter estivation

## Half-dome home

Tortoises spend more than 90% of their lives underground in self-dug burrows the size and shape of the tortoise. Look for half-dome shaped burrows under large creosote bushes.

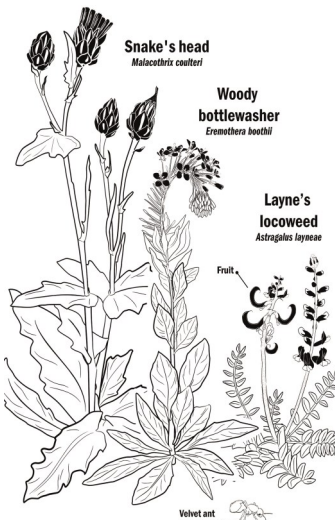
## What is estivation?

Estivation occurs in summer and is similar to hibernation. When quiet in a cool, deep burrow, the tortoise reduces loss of water and saves energy. Occasionally tortoises emerge at dawn or just before dusk for short periods. Summer thundershowers often trigger emergence to drink.

## Cool underground

Unlike some desert lizards, tortoises can not tolerate high body temperatures and become critically stressed when body temperature reach 103° F and can die at 103°-109° F.

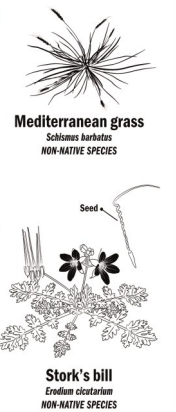
Spring is the time for tortoises to eat, especially when the wildflowers are plentiful after winter rains. Tortoises are herbivorous and selective in choosing which plants to eat. They can't eat shrubs or annual wildflowers that are high in potassium. They prefer succulent green wildflowers, especially those in the bean, evening primrose, blazing star, aster, and forget-me-not families. Among favored species are dwarf milkvetch, locoweeds, lotus, woody bottlewisher, field suncup, lacy phacelia, and snake's head.



Tortoises are threatened in part because their food supplies have been replaced by non-native annual grasses, such as Mediterranean grass, an abundant species here. The non-native grasses and non-native mustards are similar to garden weeds. The grasses and mustards compete for soil moisture and nutrients with native plants.

Stork's bill is not a native species, but an example of an introduced weed that is eaten by tortoises. Weeds successfully compete with forbs favored by tortoises.

Seeds of non-native grasses sprout early and make use of nutrients before the native wildflowers can grow and flower. Grasses contain fewer nutrients than the favored wildflowers and if the tortoises eat them, they can lose weight and critical nutrients. Juveniles eating only grass do not thrive and die. Non-native grasses and mustards flourish in disturbed areas.



Dwarf milkvetch (Astragalus didymocarpus var. didymocarpus)

Hill lotus (Acmispon brachycarpus)

DTPC © 2020

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### Creosote bush

*Larrea tridentata*

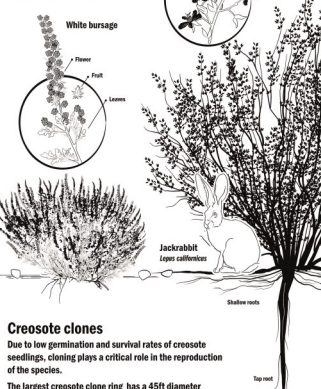
This dominant, large shrub that covers the landscape has a number of desert survival strategies and provides food and habitat for animal and other plant species.

Moisture conserving leaf characteristics include:

- Small size
- Resinous coating
- Epidermal hairs
- Drooping leaves

Root growth allows for accessing water at many levels:

- Deep tap roots
- Shallow spreading roots



### Creosote clones

Due to low germination and survival rates of creosote seedlings, cloning plays a critical role in the reproduction of the species.

The largest creosote clone ring has a 45ft diameter and may be as old as 11,700 years old. Look for small creosote rings at the DTRNA.

### White bursage

*Ambrisia dumosa*

White bursage is the second most prominent shrub and can be seen scattered among the creosote bushes. The light leaves are an adaptation to reflect the intense sunlight. The bursage also drops its leaves and goes dormant during extremely dry conditions.



### Silver or golden cholla

*Cylindropuntia echinocarpa*

The cholla is one of 3 cactus species present here. The dense spines on the cylindrical stem segments provide protection from dehydration and predators. The succulent stem segments store moisture.

### Rayless goldenhead

*Acrotholpis sphaerocarpa*

A small shrub with yellow flowers that lack petals, the goldenhead also drops its leaves and goes dormant during extremely dry conditions.

### Mojave indigo bush

*Pseudotsuga arborescens* var. *minutifolia*

This medium-sized shrub with deep roots can be covered in indigo-blue flowers for a few months in spring. It often grows along washes and on hills.

### Anderson thornbush

*Lycium andersonii*

Anderson thornbush is a small, spiny shrub that produces fruit that look like miniature tomatoes. Its succulent leaves can be dropped when conditions are too dry.

### Cooper's box thorn

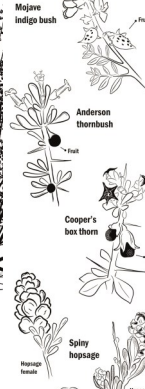
*Lycium cooperi*

Cooper's box thorn is a medium-sized, bushy shrub that produces many tubular flowers during the spring and drops its leaves during the summer.

### Spiny hogsage

*Opuntia sp.*

The female and male flowers of hogsage are on separate plants. The dry fruit on the female plants are flat and colorful, distinguishing this shrub from other medium-sized shrubs.



### Great Basin whiptail

*Aspidoscelis tigris tigris*

The slender body and tail can make a total length of 13 inches. Hunting behavior includes flicking the tongue, fast stops and starts, moving the head from side to side and digging. The diet includes invertebrates and small lizards.



### Western zebra-tailed lizard

*Callisaurus draconoides rhodostictus*

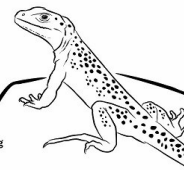
The total body length can be 9 inches. This pale lizard gets its name from the black and white banded tail, can run very fast, and tolerate hot temperatures. It feeds on small invertebrates and lizards.



### Long-nosed leopard lizard

*Gambelia wislizenii*

The largest lizard here, the female body length can reach almost 13 inches with the male being smaller. The spotted coloring determines its name. Females have distinct orange spots during the breeding season. Diet includes invertebrates, rodents, lizards, snakes and some plants.



### Desert horned lizard

*Phrynosoma platyrhinos*

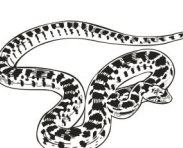
The wide flat body of the horned lizard is unique among the desert lizards. Pointed scales or "horns" extend from the back of the head. With its coloration, it is well camouflaged. When threatened, it will puff up and threaten with its horns. Over 90% of its diet is ants.



Black Harvester Ant  
*Pogonomyrmex paragelatus*

### Great Basin gophersnake

*Pituophis catenifer deserticola*



Adults are usually around 5 feet long and the color patterning is similar to that of diamond pattern of the Mojave and other rattlesnakes.

When threatened, gophersnakes rapidly twitch their tails, imitating rattlesnakes. The result can be a mistaken identification! Mostly active at dawn and dusk eating rodents, rabbits, birds and bird eggs.

The red racer is a slim, smooth-scaled snake and is very fast. Second only in length to the gophersnake. Coloring varies from reddish to light brown, sometimes with faint patterns that are almost bands. Eats small mammals, birds, bird eggs, lizards and snakes. Active during the day.



Red racer  
*Coluber flagellum piceus*

### Mojave Desert sidewinder

*Crotalus cerastes cerastes*

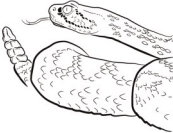
Named for its unique way of locomotion. Adults of this small pit viper are usually 12 to 18 inches long. The varied coloring of the back scales blends with the soil, camouflaging the snake as it lies in wait for its prey. Prey includes lizards and small rodents.



### Northern Mojave rattlesnake

*Crotalus scutulatus scutulatus*

Heavy-bodied adults of this pit viper are usually 18 to 40 inches long. The diamond pattern along the back is surrounded by shades of greens to browns. The venom with 2 types of toxins is injected by the fangs to subdue prey and for defense. Prey includes mostly small rodents but also snakes and lizards and can be active day and night.

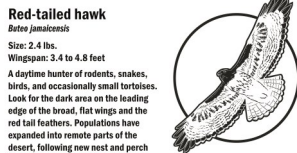


### Red-tailed hawk

*Buteo jamaicensis*

Size: 2.4 lbs.  
Wingspan: 3.4 to 4.8 feet

A daytime hunter of rodents, snakes, birds, and occasionally small tortoises. Look for the dark area on the leading edge of the broad, flat wings and the red tail feathers. Populations have expanded into remote parts of the desert, following new nest and perch sites on power poles and towers.



### Loggerhead shrike

*Lanius ludovicianus*

Size: 1.6 ounces  
Wingspan: 13 inches

Often called a butcher bird because it will impale its prey on a sharp branch or wire and return later to feed. Diet includes insects, lizards, snakes, small tortoises, small birds, and rodents.



### Desert kit fox

*Vulpes macrotis*

Size: 5.5 lbs.; 18 to 21 inches tall

These small canines are well adapted for desert life. They den in burrows which provide shelter from the extremes of heat and cold. Kit foxes prey on rodents, tortoise eggs and small tortoises, lizards, snakes, and birds. Kit foxes also eat insects and mostly forage at night to avoid heat stress during the day. They are preyed upon by coyotes.



### American badger

*Taxidea taxus*

Size: 2 to 2.5 feet long; 14 to 16 lbs., rarely up to 33 lbs.

Badgers are fierce predators of kangaroo rats, ground squirrels, tortoise eggs and tortoises, rattlesnakes, and ground nesting birds. They hunt during night and day.



### Common raven

*Corvus corax*

Size: 1.5 to 4.4 lbs.  
Wingspan: 3.3 to 4.9 feet

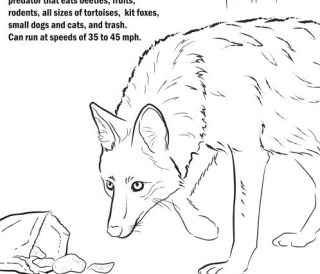
A very smart and omnivorous predator: kills and eats juvenile and adult tortoises, as well as small animals, and trash. Ravens are the most abundant predator at the Natural Area and can be seen flying alone or in flocks of up to 25 birds.



### Coyote

*Canis latrans*

Size: 15 to 46 lbs.; 1.9 to 2.2 feet tall  
Adult males are larger than females. A common generalist and opportunistic predator that eats beetles, fruits, rodents, all sizes of tortoises, kit foxes, small dogs and cats, and trash. Can run at speeds of 35 to 45 mph.



### Subsided predators

Ravens and coyotes have additional sources of food and water from humans and human activities such as road kills, trash, and domestic pets. Subsides have contributed to expansion of raven and coyote populations beyond natural levels.

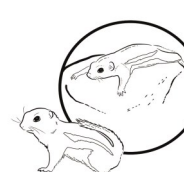
What can you do? Carry out your trash, taking it with you from the desert! Pick up trash and close lids on trash cans and waste containers wherever they occur, including in towns and cities. Leave no food behind for animals.



Merriam kangaroo rat  
*Dipodomys merriami*

### Strategy #1: Heat dumping

Antelope ground squirrels are most active during the cooler daylight hours, avoiding midday as much as possible. While foraging they will stop for a break and practice what is known as "heat dumping." When body temperatures get too warm, they find shady spots and spread out with bellies pressed against the ground. This releases body heat and helps them cool down.



Antelope ground squirrel  
*Ammospermophilus leucurus*

### Strategy #2: Sleep thru the heat

Mojave ground squirrels have adapted to the harsh desert heat by estivating through the hottest months and hibernating through winter. They enter their burrows by mid-summer, allowing their body temperature, heart rate, and metabolism to slow down. They survive on stored body fat until the winter rains bring a new growth of green vegetation.



Mojave ground squirrel  
*Xeroperomys mohavei*

Threatened under the California  
Endangered Species Act.

### Strategy #3: Don't drink!

Kangaroo rats don't need water to survive! They get all the water they need from seeds which are high in carbohydrates and yield water when metabolized. Their very efficient kidneys excrete waste by producing concentrated urine. This allows them to survive in the desert without drinking.

The Desert Tortoise Research Natural Area is a special place designed for education and research on desert tortoises and the desert ecosystem. Protected and undisturbed places are critical for many projects for students, professors, and other scientists on natural systems. Much of the Research Natural Area is remote from all but hikers and photographers.

The Research Natural Area is the site of several important discoveries:

- Causes of declines in desert tortoise populations, part of a long-term study beginning in 1979 around the interpretive center

- Two species of bacteria, *Mycoplasmag agassizii* and *M. testudineum* causing upper respiratory tract disease, an infectious and chronic disease in tortoises
- Epidemiology of upper respiratory tract disease in wild tortoises
- Excessive predation of juvenile tortoises by the Common Raven
- Baseline data comparing healthy and ill wild tortoises
- Basic physiology of tortoises: water and energy requirements
- Comparisons of populations of plants, lizards, birds, and rodents inside and outside the Natural Area fence

- Food preferences of tortoises, and how favored plants change during spring

In addition, scientists study habitat choices and genetics of the rare and threatened Mojave ground squirrel. Small and isolated populations of the very rare and tiny Barstow woolly sunflower were discovered. Studies continue on tortoise populations and on testing best methods of restoring damaged habitat and important food plants.



DTPC © 2020



## Naturalist Notes



From left to right: Alkali goldfields, a handsome male sunning at the mouth of a burrow, and a woolly sunflower species observed in a wash. Photos provided by Lisa LaVelle and Corina Godoy.

Although the DTRNA is temporarily closed to the public, our Naturalists have remained on site continuing to collect annual data on number of tortoises and other vertebrates seen, monitoring for invasive species and predators, and creating new outreach materials. With the extra rain received this spring the desert received an additional boost. The wildflowers became more vibrant and fragrant and all kinds of organisms were out and about! So far this season, our naturalists have observed tortoises on at least 17 occasions, including at least one juvenile. 21 other vertebrate species including leopard lizards, horned lizards, Mojave rattlesnakes, common night-hawk, gray long-tailed pocket mouse, and Say's phoebe have all been observed. The tortoises are unphased by the global pandemic and have been enjoying nature's buffet!

## Management Update: Raven Monitoring and Mitigation



DTPC technician Sara Jacintho in the field checking a perch site.

This spring the DTPC began a raven monitoring and mitigation project in an effort to control raven predators in and around the DTRNA. DTPC field technician Sara Jacintho has been monitoring 8 previously identified nests and 3 new nests for activity with the help of several volunteers. While ravens can and will re-use nests every year, several other species may also use these sites. There are commonly several nest sites within a raven pairs home range and if disturbed, the pair may move to a site to re-nest. While raven nests are found in a variety of manmade structures (like the old water tank located in the DTRNA pictured right) most nest sites found in the DTRNA are Joshua trees or rocky ledges. Working with permitted biologists from Sundance Biology and Hardshell labs, six active nests in the

DTRNA have been oiled so far this year. Oiling is a humane way to decrease population numbers by stopping the full development of eggs. Sequential years of oiling may indicate to the birds they are not successful in particular areas and result in them abandoning nesting attempts, similar to what has been observed elsewhere in critical habitat (T. Shields per comm.). This is part of a larger United States Fish and Wildlife effort occurring throughout desert tortoise critical habitat to reduce raven population numbers. We would like to thank the BLM, USFWS, Sundance Biology and Hardshells labs for their assistance with this important work. We would also like to acknowledge volunteers, Nadia and Alexia Svejda, Simon Fierst, Gianna Uriarte, Michael Thamann, Craig Bansmer and Bonny Ahern for assisting with monitoring efforts, and Steve Ishii with his assistance on data and mapping. This project has not only allowed for active management of the raven problem in the DTRNA but has provided pivotal updated information on nest sites and raven activity to be used in developing future projects.



(Above) Tim Shields from Hardshell Labs, working with Sundance Biology, oils a raven nest on the western DTRNA. Corina Godoy (DTPC naturalist) assists. (Below) Aerial view of nest prior to oiling.



## **In Memoriam**

**REMEMBERING RON MARLOW - FEBRUARY 9, 1949 – JANUARY 19, 2020**

**By Ken Nussear, University of Nevada, Reno**

I received a message from Leslie Marlow on the morning of January 19<sup>th</sup>, 2020. She informed me that her father had passed sometime during the night. I sat watching the sun rise simply stunned. When was the last time we had spoken? When was the last time I reached out to see how he was doing and what he had been enjoying lately?

Ron was an early researcher of desert tortoises. His dissertation research was conducted at the Desert Tortoise Research Natural Area in California before it officially became a Research Natural Area. He was one of the earliest scientists to conduct detailed research on the physiology and temperature relations of desert tortoises. His work pioneered techniques of measuring metabolism, not just on the laboratory bench, but tied to activity. He measured activity by means of burrow monitoring, and mechanical thread trailing devices (which also collected feces for energetic calculations). He coupled physiology with behavioral observations – calculating the first annual activity budget for desert tortoises. He completed his dissertation, and was awarded his PhD from UC Berkeley in 1979, working under the renowned herpetologist Dr. Robert C. Stebbins, renowned Physiologist Dr. Albert F Bennett, and a celebrated Geographer, Dr. Bernard Q. Nietschmann. Ron followed this work with research on Galapagos Tortoises, as a visiting scientist at Charles Darwin Research Station, Galapagos, Ecuador, working as a Postdoctoral Scholar with Dr. Stevan J. Arnold (Chicago). He followed this work with a second Post Doc with Dr. Karl Gans (Michigan), and with a visiting professorship at the University of Santa Clara, as the Alexander von Humbolt Fellow, at Universität Tübingen, Germany, and a visiting scientist (working on human locomotion and endurance) in Dalhousie University, Halifax, NS, Canada. Ron published on many topics outside of his work with Desert Tortoises, including describing a new species of salamander in the Inyo Mountains of the norther Mojave Desert, California, Work on the physiology, shell shape, and feeding of Galapagos Tortoises, the locomotion of both Chelonians AND humans!

Ron moved to Las Vegas NV, where he raised two daughters (Rachael and Leslie) with Dr. Karin von Seckendorff Hoff. Karin was a professor at the University of Nevada, Las Vegas, and Ron began as the state herpetologist for the Nevada Division of Wildlife, and later as a Research Professor with the University of Nevada, Reno. Ron had always been an advocate for conservation, having served on Endangered Species Advisory Committee for the Bakersfield HCP, International efforts for Steppe Tortoises in Turkmenistan, Specialist groups for the IUCN, and the Technical Advisory, and steering Committees for the Clark County Habitat Conservation Plan, NV – among others.

Ron was also dedicated passing his passion for science and conservation to the next generation of scientists. I met Ron as a new graduate student at the University of Nevada, Reno. Ron was integral to my work on translocation of Desert tortoises, helping to find a new fate for the tens of thousands of animals displaced by development in and around Las Vegas, NV. Ron served on the Graduate Committees of several UNR students, and our work would not have been possible without his dedication and guidance.

Thank you Ron for all you gave toward the preservation of our natural systems, our imperiled species, and to the betterment of our community and our world. We miss you Ron, the desert weeps.



## In Memoriam

### **PETER PRITCHARD, WORLD-RENOWNED TURTLE CONSERVATIONIST PASSES**

Peter Pritchard, known to us and to our friends in the California Turtle and Tortoise Club died earlier this year at the age of 76. Pritchard was a world traveler, visiting every known site where living turtles and tortoises remained, as part of numerous conservation initiatives. His Chelonian Research Institute in Oviedo Florida contains one of the world's most comprehensive collections of turtle and tortoises shells. Prichard is considered a scientist's scientist, and he mentored students from around the world, touching many lives. His home became a gathering place for international visiting scientists and turtle enthusiasts. He and his wife Sibille were gracious to all. Time Magazine named him a Hero of the Planet.



Photo from the Orlando Sentinel.



### **ED HASTEY, FORMER STATE DIRECTOR OF THE BUREAU OF LAND MANAGEMENT IN CALIFORNIA**

The year 2020 marks the passing of an important person, Ed Hastey. For those of us who worked to make the Desert Tortoise Natural Area possible in the 1970s and early 1980s, Ed Hastey was a champion of the desert tortoise, the Desert Tortoise Research Natural Area, constructing the fence, and the interpretive kiosk. He is considered a giant among State Directors for his inclusive and wise management style. After his 40-year history with the government, he moved into the private sector to work on major conservation projects.

Photo from the Bureau of Land Management.



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1. YES, I want to help save the threatened desert tortoise and its habitat! Here is my tax-deductible membership contribution of:

☐ \$25 Individual  
☐ \$40 Family  
☐ \$75 Sponsor

☐ \$100 Benefactor  
☐ \$200 Patron/Corporate  
☐ \$1000 Life Membership

2. My membership is current but here is an additional donation of \$\_\_\_\_\_.  
Please use it for:

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☐ Other:\_\_\_\_\_

3. I'd like to help you grow the DTPC endowment. Please accept an additional donation of:

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☐ \$1,000                                      ☐ Other \$\_\_\_\_\_

☐ Marketable Securities (Stock): Contact DTPC Finance Committee Chairperson, Greg Lathrop at [2redgrey@gmail.com](mailto:2redgrey@gmail.com) or (415) 637-7187 for assistance

Let's grow the endowment!

- ☐ I would like my contribution to remain anonymous  
☐ I would like to receive Tortoise Tracks electronically (please provide email address)

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**Desert Tortoise Preserve Committee  
4067 Mission Inn Ave.  
Riverside, CA 92501.**

Thank you.

\*All contributors receive the Tortoise Tracks newsletter. The Desert Tortoise Preserve Committee is an IRS recognized tax-exempt 501(c)(3) nonprofit corporation. All contributions and/or annual membership dues are fully tax-deductible. Contributor information is kept confidential and is not disclosed to third parties.

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## Calendar of Events

May 16—Telephonic DTPC Annual Meeting 1:00 PM PST

To join call 1-515-604-9099 and enter access code 397007491#

June 20—DTPC Board meeting

Mark your calendars for next year's Annual Meeting and Banquet! Our DTPC Annual Meeting and Banquet will be held on Saturday, January 30, 2021. Location to be determined

**GO GREEN**

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