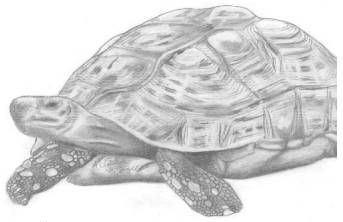
Tortoise Talk

"Happiness is a flower in the desert."



"Ruby Beta" By Alysha Wogee

Life Begins In The Desert

Greetings readers! Great Basin College Nature Club began late in the Fall of 2013 with just a few ambitious young students under the guidance of Dr. Rita Bagwe who is the biology instructor in Pahrump. Our goal as a club is to explore and learn about our surrounding environments and share that knowledge with those around us. It has been an honor and privilege to see the emergence of such an amazing group of students come together and explore nature as a team.

The Nature Club dedicates each Spring/Fall semester to one theme. The theme for this newsletter is "Desert Life". From the lowest point in North America at Badwater Basin, to the peak of Dante's View in Death Valley, the unique wildlife of Ash Meadows, the oasis of dates at China Ranch, and much more, the GBC Nature Club has explored the desert theme to it's fullest since we began. We welcome you on our journey and we are excited and honored to have this issue come alive. It's Nature Club's first newsletter, and most certainly not our last. We hope you enjoy this issue as much as we have enjoyed writing it.

Nature Club Fall 2013 - Spring 2014

Back Row: Kip Magee, Sarah Czipowski, James Russum, Ian Cark, William Ortman.
Middle Row: Jessica Ceja, Shelby Harris, Holly Brice, Tommy Miller, Alysha Wogee, Victoria Pryor.
Front Row: Brionna Moore and Ruby Beta

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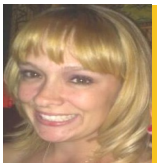


President's Report

Greetings everyone!

Let me start out by saying what an awesome opportunity this has been. I have had such a great time seeing all of the amazing places with this wonderful group of students. It has been a crazy ride from starting the club, to being officiated by the Student Government Association, and finally getting our club shirts! I will admit that there have been rocky moments at times and setbacks, but we all worked together and had a great time.

This club has been more to me than just a club. It has been a second family. I never really connected with any of the students here on campus until I joined the Nature Club. The educational value alone has been worth all the hard effort we put in. The speakers that came to the campus were enlightening and informative. The passion they all show for their fields is encouraging for me to continue on my educational path, whatever it may be. I have heard only wonderful things about the speaker presentations in passing and it has truly been a key element to what we as the Nature Club believe in. We want to see the club not only continue, but flourish over the semesters to come.

As I looked out across the top of Dante's Peak in Death Valley, CA and watched the sun set across the vast and desolate desert, I realized how valuable my time and effort really was. It brought me perspective about what my role was in Nature Club and how important conservation and preservation of all living, and some nonliving, things are.

A huge thank you to all of the club members that have given their time, dedication and hearts to this club. I have been right there by your side since day one and I had a great time traveling and learning with you as well. This club never would have come to be if it were not for all of the members who worked so diligently to see it come to be. Thank you all for hanging in there and watching as we brought life into our desert home here in little Pahrump, Nevada. We have truly embodied our motto, "Happiness is a flower in the Desert." See you all next semester.

Holly E. Brice
GBC Nature Club
President

Vice President's Report

Hello everyone!

Welcome to the Great Basin College Nature Club's first official newsletter. There is some amazing life to uncover and historic sites to experience in America's majestic Mojave Desert biome surrounding southern Nevada. The Great Basin Nature Club is a group of genuinely nature minded folks from a wide range of backgrounds and we do our best to not only learn about this awesome gift of life of the Mojave, but go out and see it for ourselves. It would be great for you to join us and hit a trail or two… or maybe even camp-out with us under the stars. We look forward to meeting new people that share an appreciation for this incredible earth and the life it brings us. If this sounds like your cup of coffee then shoot us a line and introduce yourself. Take it easy and have a pleasant tomorrow.

James D. Russum,
GBC Nature Club
Vice President

Did you know?

"The Ash Meadows Sunray is one of at least 26 plants and animals that are endemic to Ash Meadows National Wildlife Reserve"

Well now you know!

See References #13 Page 22

Guest Speaker Report

We would like to take a moment to give special thanks to those who have taken time out of their lives to come and speak to the Nature Club about their respective fields. Their knowledge enhanced the educational environment for the club. The presentations left a memorable impression with invaluable information for not only the club members but the community that attended as well. In keeping such an open door policy with the Nature Club meetings and speakers, everyone has been able to benefit from these presentations.

Our first speaker in November 2013, was one of our own nature club members, Mr. Scot Troter, who is a respected Master Gardener here in Pahrump and is also a member of the Master Gardener Association extension office. His amazing presentation included a lot of information on the local ground soil and shrubbery here in Pahrump. Learning about our natural landscape and flora has helped us to be more aware of our surroundings and associate it with the wildlife that resides here.

Our second speaker was actually two amazing individuals from the Red Rock Audubon Society (RRAS). Mr. Richard Cantino and Mrs. Darlene Feener came in February 2014 to teach us all about birds.

Darlene Feener has been a "birder" here in Pahrump for over 40 years. She beautifully presented an introduction to the differing types of birds that are commonly seen in our area, and taught us how to identify them. She presented beautiful photos of the local birds from her own private collection. She also included audio on the calls for each bird during the presentation. Since then, many of the members have been able to identify some of the more common species on our hikes and adventures.

Mr. Cantino is an avid "birder" as well and gives his time to the RRAS and works closely with U.S. Fish and Wildlife on the Burrowing Owl Conservation Project here in the desert. His presentation on burrowing owls left the whole room with a warm heart. Their cute, fluffy, and funny nature captured the room, and Mr. Cantino brought to light the importance of the Burrowing Owl Project. At the presentation anyone who wished to become a burrowing owl monitor was invited to do so as part of the Urban Burrowing Owl Project.

Professor Gregory Doyle who teaches geology here in Pahrump, presented on March 2014 about Pahrump Valley and the Valley of Fire from an *inorganic* perspective. Professor Doyle explained in depth about the formations of the mountain regions and their topographical characteristics, as well as what the various beautiful formations in our desert environment can tell us about the past. In understanding the past, we can better see the future. While Nature Club traveled to the Valley of Fire after the presentation, we were able to identify and appreciate the rock formations and unique positioning of their structural makeup, acknowledging the centuries it took for them to come to be what we see today.

Our last speaker this season was Mr. Lynn Jaussi on April 18th. His presentation content focused on "Exploration" especially in and around Pahrump. He spoke about nature and the amazing ghost towns he has explored. He advised everyone to, "Take a picture of these things because chances are the next time you come to see them, they will most likely be gone." From the various wildflowers in the desert areas, to the century old graveyards, Mr. Jaussi captivated his audience as he brought exploring the desert to life. Also, for the first time since we began inviting speakers to GBC, we decided to broadcast this, as well as future presentations utilizing IAV (interactive video) so that our extension sites across Nevada may attend as well.

It has been a wonderful year for the Nature Club and we thank all of the amazing guest speakers for coming to talk to us about their life's passion. We welcome anyone who wishes to join us for speaker presentations to just simply show up. All of our guest speakers are announced on our webpage and you can contact us at 775-727-2005 anytime. Nature Club is always looking for more guest speakers. If you are interested, give us a call.

The Life of the Desert Tortoise *(Gopherus agassizii)*

By Tommy Miller

In the beginning...

"Ruby Beta" is what we decided to name her, and by "her" we mean the desert tortoise that was saved by our biology instructor on campus, Dr. Rita Bagwe. She took her in after someone found her in their backyard and didn't quite know what to do with her. Since that time, over two semesters ago, Ruby has had a full and exciting life filled with fresh greens, nourishing tortoise food, and of course, a special hibernation spot to disappear into during the winter seasons.

Ruby may see this as a life of luxury, but for the students here at Great Basin College in Pahrump, she has become a light of inspiration because of what she stands for. Ruby's species is at risk in our delicate desert ecosystem as many other species are around the world. The idea to have a Nature Club initially came from Dr. Rita Bagwe and took flight as soon as Ruby was adopted as our mascot.

We wear Ruby's image on our shirts with pride and care for her as though she were the last tortoise on earth. She will live with the Nature Club for only a short period of time as she eventually will find a new home, but her memory will live on in the hearts of future Nature Club members. We only hope she will inspire others to see nature and everything in it for what it is, delicate and temporary. This issue is the first of many to come so we decided it should start with an article about none other than Ruby's own kin, the Desert Tortoise.

"A good man is the friend of all living things." ~Mahatma Gandhi

The Mojave Desert tortoises have been facing a huge array of issues that have threatened their existence. These concerns have resulted in the decline of the desert tortoise's population, which has been the reason for them being listed as threatened in 1990. These declines have been due to habitat loss and degradation. This is from increasing human activity in the desert as well as disease. The tortoise is important to the ecosystem because it creates burrows that provide shelters for different species. Although human activity causes harm, people have been helping the desert tortoise by ensuring that the impact on their population is at a minimum. There have been government and wildlife agencies as well as conservation groups that help to preserve the desert tortois' species. Due to the help these agencies provide, we will not have to worry about losing the desert tortoise anytime soon.

The desert tortoise is medium-sized species, in comparison to other tortoises, that is found in the south-western desert regions of Northern America. This reptile seems to intrigue people everywhere. Desert tortoises are most commonly known for their high patterned shells and their habitat of choice, a burrow underground. The desert tortoise has many biological adaptations that enable them to survive more successfully in such arid conditions. The front legs of these unique reptiles are heavy and flattened in shape. These include a complete set of claw-like scales, which are indicative of effective digging abilities. As with other tortoise species, the desert tortoise is an herbivorous animal surviving only on plants. Grasses make up the majority of the desert tortoise's diet along with various herbs, wild flowers, rare fruits and berries that can be found within their habitat. Like most burrowing animals, the desert tortoise creates a subterranean environment beneficial to other reptiles, mammals, birds, and invertebrates. Animals which share tortoise burrows benefit from permanent or temporary shelters when the tortoises vacate them after hibernation ends. (1)

Figure 1– Reference #1

The Mojave Desert tortoise is among the four species of tortoises found in North America, all of which are grouped in the genus *Gopherus*. They inhabit the desert and subtropical scrublands of the American southwest.

Continued on page 5

The Life of the Desert Tortoise *(Continued)*

By Tommy Miller

They belong to a group commonly known as gopher tortoises. They represent a distinctively North American lineage of testunid turtles characterized by structural specialization for digging and burrowing.(9) They have several adaptive advantages in variable terrestrial environments, such as a greater strength, more physiological stability, and larger nutritional reserves.(6) The Mojave Desert tortoises inhabit both valley bottoms and more rugged upland terrain, where in either case, they spend much of their lives avoiding inhospitable desert conditions in self constructed burrows, or existing caves and rocky shelters. (2) No other desert tortoise can survive the inhospitable environmental conditions like this species does.(3)

The desert tortoises are primary consumers and they are prey for various mammalian, avian, and reptilian predators. They are also the desert's ecosystem engineers; digging burrows that are used as shelters by snakes, lizards, birds, rodents, javelinas, and insects along with other invertebrates. Such burrows stabilize temperature and humidity providing protection from intense winter freezes. (4) The desert tortoise is considered 'keystone' to the Mojave – meaning that it plays a significant role in maintaining the integrity of the desert ecosystem and if lost, will put other species at risk for extinction.(5)

The Mojave populations of the desert tortoise (*Gopherus agassizii*) were listed by the U.S. Fish and Wildlife Service in 1990 as a threatened species because of widespread population declines, particularly in California.(2) Prior to the early 1950's, many populations reached densities of several hundred tortoises per square mile. Today, most populations contain only a few more than five to fifty tortoises per square mile.(2) The desert tortoise has lived in the Mojave and Colorado/Sonoran deserts of California, southern Nevada, Arizona, southwestern Utah, and in Mexico for thousands of years.(8) They did not have to deal with the threats that they have to face today, thousands of years ago. If there were not as many threats today the desert tortoise population would not be declining.

Figure 2– By Tommy Miller

Many of these threats are from humans, including habitat loss, fragmentation, road mortality, shooting, collection for food, the pet trade, trampling by livestock, and predation by feral dogs and ravens, which thrive around human settlements.(4) These normal human activities tend to exacerbate natural impacts. We as humans need to make an attempt to protect these desert tortoise populations because unfortunately, we have become their worst enemy.

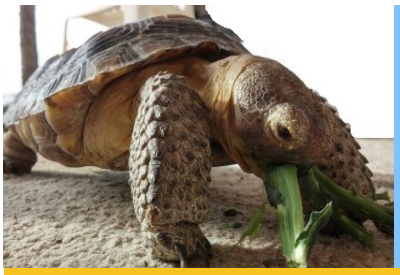
As a result of the declines in tortoise populations, people have taken the initiative to go to great lengths to ensure future efforts are made to preserve this special species for years to come. Various conservation efforts have taken place since they were listed as threatened.

"The desert tortoise is considered a 'keystone' to the Mojave"

Since the Mojave Desert tortoise was given protection under the Endangered Species Act in 1990, numerous actions have been taken to conserve the species.(2) Four State wildlife agencies and three Federal government agencies have the primary responsibility for protecting and managing desert tortoise populations and their habitats.(7)

Without the help of people the desert tortoise would not be listed as threatened but as endangered, or even worse extinct.

See References #1 Page 22



Did you know?

The desert tortoise can live anywhere from 50 to 80 years? The majority of desert tortoise deaths is due to predators than old age!

Well now you know!

Solpugids: The Not-Spiders of the desert

By Sarah Czipowski

Maybe you have heard of these creatures before. Maybe you have even seen some. Perhaps on the internet you have seen pictures of these immensely large, frightening insects that are said to be as big as dogs and go after humans if given the chance. They are not spiders, nor are they scorpions. They typically have a yellow or orange hue, eight legs, a thorax and a head of the same size. On the head there are two huge jaws. What are these things? Are they dangerous? Should I be afraid?

These creatures are called Solpugids (Sole-pew-jids), otherwise called solifuges, solifugids, etc. Some other vernacular names include false spiders, camel spiders, and sun spiders. They are related to scorpions, and are not truly classified as spiders. There are over 50 species within the southwestern United States. They are generally feared by people due to their appearance, size, speed, and false rumors about their behaviors.

"arms" called pedipalps that are used to catch prey before crushing them with their fangs, that are called chelicerae.

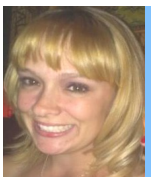
Figure 1– Reference #2

Although there are rumors about camel spiders eating humans (especially the variety of non-existent solpugids with an immense size), they are opportunistic feeders that mainly feed on insects. There is also no concrete evidence that solpugids are venomous or poisonous, as they do not contain poison glands, nor is it confirmed that toxins are secreted by the hairs near their jaws. If you see a solpugid inside your home, gently (and quickly) attempt to retrieve it inside a container, such as a jar, and release the creature outside. A sighting of one inside of a home is also a sign of a pest issue, as Solpugids' diets are mostly made up of other insects.

"They are not spiders, nor are they scorpions."

Camel Spiders and some of their relatives can grow to be about 6 inches in size, and go to speeds of about 1.2 miles per hours (53cm/s). They somewhat resemble scorpions, although they do not possess a tail with a stinger, nor do they possess the large claws of a scorpion. They have

See References #2 Page 22



Predatory owls, from the ground?

By Holly Brice

Swift, silent, deadly, and living in a hole in the ground? Burrowing Owls are considered both predatory due to their diet, and prey due to their vulnerability while living in burrows in the ground. Why would a species of owls live in the ground and not in a tree? These tiny predators have some of the most unique survivability techniques and interesting personalities known to owls.

The burrowing owls, *Athene cunicularia,* are named appropriately due to their lifestyle choice. They inhabit burrows that have been dug by other creatures such as the desert tortoise, kit foxes, skunks, prairie dogs, and other small animals.(2) They are interesting because they have unique personalities that are distinctly different from other species of owls. One thing that differentiates them is not only their habitat of choice, but their calls and physical behavior. Often when a baby burrowing owl senses threat or danger it will mimic a rattlesnake's hissing sound to scare predators away.(1) Parents will often perform a bobbing motion to express excitement or danger.

Most people assume an owl is only active at night, however the burrowing owl must protect their burrow all day and all night long due to their vulnerability to every animal that may trample on their burrow, including humans.

Continued on page 7

Continued- Predatory owls, from the ground?

By Holly Brice

The burrowing owls are tiny in comparison to what we consider a predator. An adult owl will be only about 10 inches tall and weigh about 6 ounces.(1) Unlike other owl species, the burrowing owl female is the same size as the male. The only difference is the male will be lighter in color through the mating season due to the long hours he spends outside the burrow watching for predators. Their coloration is a brown and white speckled coat and a white belly. They have long legs and short tails. They also lack the ear tufts we see on most owls.(2) Bright yellow eyes are easy to spot with a distinctive white eyebrow. These are one of the smallest owls in North America.

Figure 1– Reference #3

Burrowing owls are able to eat a plethora of small animals such as small rodents, lizards, and small birds. They can also eat dung beetles and other insects as well. Generally they hunt for rodents and mammals during the night, and insects in the daytime. The burrowing owls are smart because they use what is known as "adornments" to scatter around their burrow. The adornments are made of animal feces from dogs and other animals. This serves a few purposes. It shows their burrow is inhabited to other owls and animals, including possible mates during courtship. It also repels animals that don't care for animal feces and masks their scent for protection. In addition, it attracts dung beetles and other bugs for food.

Burrowing owls nest in treeless areas that range from the Pacific states into Canada and even out to the Midwestern states. The mother and father will mate in early spring. They both will care for their owlets until they are able to fly and hunt on their own. Generally this occurs for about a 40 day period. Burrowing owls will live anywhere from 6 to 8 years.(3) After the mating season, they take winter flight into Central America, South America, and Mexico. However, they will avoid the rainforest.(3) The populations of burrowing owls that live in Florida will stay there year round, avoiding migration patterns.

Although the population of burrowing owls is not exactly known, it is estimated to be around 10,000 mating pairs, and known to be declining. The use of pesticides on prairie dogs and small mammals is affecting their food source. Many owls are killed every year due to automobile collisions and burrow abandonments.(3) Due to urbanization in many habitat areas, many owls lose their burrowing sites during the mating seasons. This species is known to come back to its own burrow every year. If the burrow has collapsed or been removed, they are forced to find new quarters.

Figure 2– Reference #3

Burrowing owls are endangered, threatened and of special concern. The reason for having three differing status' is largely due to their migration pattern. The localized areas they travel to determines their status. In Canada they are endangered. They are threatened in Mexico, they are of special concern in Florida and the western United States. Due to the fact that they are mating in Canada and the western U.S., it is essential that we take proactive measures to ensure their survival.(1)

The U.S. Fish and Wildlife services are working annually to continue the Burrowing Owl Monitoring Program that is conducted by many organizations with volunteers who monitor them during critical mating periods. They are also working to produce satellite sites that are established and protected areas of permanent burrows. This provides for ongoing protected areas that this species can return to year after year. There are things individuals can do to ensure burrowing owl survivability as well. If you are privileged to live in an area that is a home to these burrowing owls, leave them alone. If you see a burrow and notice that they might be in a high traffic area where they could be in harms way, notify your local Fish and Wildlife conservation organization or local Audubon society so they can check it out.

One of the biggest threats to these magnificent owls are people. By disturbing their burrows with off road vehicles, and unwelcomed disturbances, we risk the mating process, which directly affects the population count. The next time you are strolling along on a nice desert walk in the middle of nowhere and see a burrow in the ground with a very angry bobbing owl staring at you, remember to walk away because they are not as vulnerable as you might think. You might come out wearing an owl hairdo if you are not careful.

See References #3 Page 22

The Cool Cactus of Wheeler Pass

By William Ortman

An Anecdote

One day while hiking in Wheeler Pass (near the outskirts of Pahrump) with one of my math pupils and his family, we stopped for a small break near a lime green cactus with big pads and lots of spines. Mikey had brought his machete and began hacking at the cactus. I said to him, "Hey Mikey, let me see that." I took the machete, and sliced off part of a pad. Carefully, I removed many spines, and I took a bite out of the now harmless cactus pad. It was chewy, watery, and tasted just like a kiwi! "Looks kind of like a prickly pear" I thought to myself. I snapped a picture and we continued on our merry way. Once notified about the Nature Club newsletter and directed to write an article, I knew what my topic would be. After diligently searching the internet, I discovered that the cactus was *Opuntia chlorotica*, a species of prickly pear!

Opuntia clorotica is part of the Cactaceae family of plant species. It is commonly called the "pancake prickly pear"(4) and the "dollarjoint prickly pear".(3) Studies conducted in the Waterman Mountains of Arizona confirm that this species has been around since the *Wisconsinan Glaciation* period. It is native to the southwestern United States and northern Mexico. Many adaptations have been developed by this species over the years to combat the harsh desert conditions that it grows in. The plant thrives in the wild but also has been domesticated for various reasons.

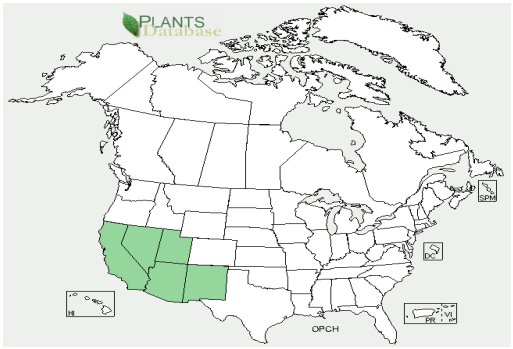


Figure 1– Reference #4

Opuntia clorotica is not only found in Wheeler Pass, but also all over the southwestern United States and northern Mexico. These areas are full of "igneous substrates [and] rocky or sandy soils"(6) in which it grows in.

Opuntia clorotica, along with other members of the *Cactaceae* family, has developed advanced morphologies to deal with the harsh desert conditions in which it is distributed. These include "different methods of water storage, photosynthesis, and alternative means of reproduction". (5) Water is stored in pads which branch out from the trunk. This is because water is not always available due to the low rainfall occurring in the regions in which *O. chlorotica* lives. The spines have also been developed to reduce water loss and to protect the plant from predators. A Pancake Prickly Pear found in Wheeler Pass has big spines with half a centimeter diameter that can be a centimeter in length. Surrounding the big spines are small needles half a centimeter long with a negligible diameter. They can get stuck everywhere be very painful. Another interesting adaptation of the Pancake Prickly Pear is that it collects CO_2 for its energy cycle at night. This is because the stomata which collect the gas are closed during the day to conserve water. The CO_2 is stored during the night as an acid.

Opuntia chlorotica has been used for hundreds of years and is commonly domesticated. It was used by Native Americans to treat burns.(4) It was also used to treat diabetes before the advent of modern insulin synthesis. In rat models, rats induced with diabetes were able to sustain regular blood glucose levels. It also has an impact in treating ulcers. The cactus acts as a natural sweetener and is high in fiber. Topical application has increased the rate of cutaneous repair in rat models. It can be taken as food, juices, gels, jellies, or as a powder. Other benefits include its properties as an anti-inflammatory and antioxidant.

Figure 2– Image by William Ortman

Mother Earth provides people many useful things right under their noses. A trip to Wheeler Pass can help one discover a plant that is all over the region they live in, that has fought to survive as a species since at least the last glacial period. At first glance, a hiker may think that it is just an evil pokey bush; little would they know that it is a plant with a wide variety of benefits ranging from healing cuts, burns and ulcers, to being an antioxidant, anti-inflammatory, fibrous sweetener.

See References #4 Page 22

Welcome to Pahrump

By Scot Troter

Nature Club's first presentation hopefully opened some eyes about our wonderful little town. The presentation started off by highlighting the Cooperative Extension as a great resource for the town of Pahrump. It explained what makes a desert as well as desert soil. It gave hope and some suggestions for growing a garden. It identified some of the most common plants from tallest to shortest. And it ended with one simple 'principle': Do not water at night!

The Morrill Act of 1862 was a beginning that blossomed into land grant universities. Nevada's land grant university is the University of Reno. This led to Extension offices in each county. The three basic parts of the extension are: outreach programs, 4-H, and the Master Gardener program. The programs help young and old alike. And if you have an insect or plant that you would like to know more about, bring a sample or picture and just walk in.

4 inches. This lack of rainfall and the fact that we live in a valley that essentially is a bowl, leads to a build up of salts and clay. But there is hope for those that love nature and gardens because clay particles have a negative charge that holds water and most of the essential nutrients that plants need to thrive. The clay soils just need some compost to give it air pockets for the plant roots.

Some of the most common plants from tallest to shortest are: the hybrid version of salt cedar called 'atthal', pine trees, common salt cedar, mesquite, creosote, tumble weeds, four-wing salt bush, globe mallow, and Russian thistle.

"watering at night is a bad idea..."

Image By Sarah Czipowski

Deserts are defined by precipitation rates. Pahrump and Las Vegas are in the center of the Mojave Desert. It is the driest desert in the United States with an annual rainfall rate of just

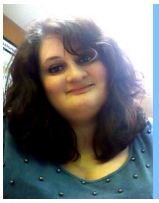
The presentation ended with an explanation why watering at night is a bad idea even though most people think that watering at night better for their plants. First, the sun is the pump that pulls water up into the plant; and it is not out at night. Second, watering at night gives fungus a chance to infect plants. I hope everyone took something away from the presentation.

"Badwater Basin" By Holly Brice

Did you know?

Did you know that in Death Valley, California the crystalized salt formations in "Devils' Golf Course" are a formation from an ancient lake that once covered the valley floor to a depth of 30 feet?

Well now you know!



The Greater Roadrunner

By Shelby Harris

The Greater Roadrunner *(Geococcyx californianus)* is native to the American southwest and the upper parts of Mexico. They are found in arid desert regions and regions with scattered brush and open grassy areas. They have been found in California, Arizona, Nevada, Utah, Colorado, Texas, New Mexico, Kansas, Oklahoma, Louisiana, and Arkansas. Their relative, the Lesser Roadrunner *(Geococcyx velox)* can be found in southern parts of Mexico. They are non-migratory and they defend their territories year round.

Most people have seen the Looney Tunes version of the roadrunner: blue, almost ostrich looking and always taunting the coyote with its call "beep beep". The real roadrunner actually is mostly dark brown on its head, neck, back and wings with white streaks and a white breast. Their eyes are bright yellow and the mature ones have blue and red skin behind the eyes. Like the cartoon, they have a crest of feathers on their heads that looks like a pompadour. Unlike most other birds, both sexes look the same. Roadrunners are medium-sized birds that usually weigh 8-12 ounces and are about 20-24 inches tall. Also like the lovable cartoon, they prefer to run rather than fly. They can reach up to 17 mph while running and can cover great distances. If they do have to fly, they only remain airborne for a few seconds. They show great curiosity and will often approach humans to get a better look.

The Greater Roadrunner mates for life. To find a mate, the male will often chase the female while taking frequent rest stops. Food is a very important part of their mating ritual, as the male will often tempt the female with food. If she accepts the food, they will most likely mate. Mating can occur once or twice a year depending on the availability of food and materials for nests. Nests are usually in off of the ground in bushes or trees to keep predators away. Their brood sizes range from 2-8 eggs. Their development is quite rapid; their incubation is about 20 days, they can catch their own food at 3 weeks, they become independent in around 30-40 days and sexual maturity is reached around 2-3 years old.

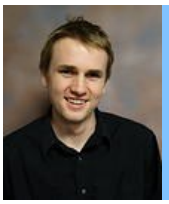
The Greater Roadrunner plays the roles of both predator and prey. It is omnivorous, eating insects, lizards, snakes, and mice. They even eat rattlesnakes, although it is rare. They can also eat other birds such as the hummingbird and quail. They eat prickly pear cactus where it is available. To hunt, they walk rapidly and scan for prey. When they find some they dash forward to make a catch or jump into the air to catch insects and knock down low-flying birds. Known predators to the Greater Roadrunner are hawks, house cats, skunks, coyotes, and raccoons.

"The Greater Roadrunner mates for life."

Figure 1– Reference #5

Roadrunners are pretty common here in southern Nevada. They are however, encountering habitat loss because of urban sprawl. Road construction causes their territories to be fragmented and they also encounter mortality from passing cars. They were also illegally shot because rumors that they were eating the quail, even though occurrences of roadrunners eating quail is pretty rare. Research shows that they have little chance of staying in southern California due to the massive growth of cities. Their habitats are being fragmented so much that their territories are not big enough and the brush is becoming scarce. This is a problem because the Greater Roadrunner prefers the climate that exists in southern California. They also help to eliminate pests such as mice and insects from the areas.

See References #5 Page 22



Shoshone Bird Watching

By Ian Clark

One of the first trips that the Nature Club went on was to Shoshone, California last fall to do bird watching. Our group's tour guide and overall bird enthusiast, Len Warren, showed us several species living in the area and how they related to each other. One of the most striking features of the area were the Mesquite trees (*Prosopis glandulosa*).

The Mesquite tree is a common desert tree in the Southwest.(3) Features common to it are its thorns that discourage desert herbivores from eating it, long root systems which can span over 100 feet to get to ground water, waxy leaves to conserve that water, and honey mesquite bean pods which were a food source to the local Indian and settler populations.(3) The Mesquite tree tends to have a (parasitic) plant growing on it called Desert Mistletoe (*Phoradendron californicum*).(2) Desert Mistletoe "invade[s] the bark and sap of the host plant"(2) which causes the plant to weaken or die from a lack of water or nutrients.

Mesquite tree on a desert mountain slope.

Figure 1– Reference #4

"Desert Mistletoe 'invade[s] the bark and sap of the host plant'"

Figure 2– Reference #6

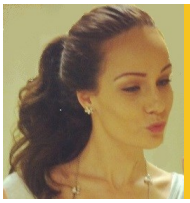
Even though Desert Mistletoe is deadly to the Mesquite tree, it is life-sustaining to another creature.(2) Desert Mistletoe grows berries which a bird known as Phainopepla (*Phainopepla nitens*) eats.(2) Phainopepla have a unique relationship with Desert Mistletoe.(1) The berries that the Phainopepla eat have seeds for the Mistletoe plant. Often, the seeds will be excreted by the bird onto another desert tree where the Mistletoe plant will grow.(1) Essentially, Phainopepla helps make its own primary food source grow.(1) Our guide, Len Warren, showed our group many of the Shoshone birds and their nests but especially Phainopepla.

See References #6 Page 22

Did you know?

China Ranch Date Farm in California was planted in the early 1920's by seed from a lady named Vonola Modine?

Well now you know!



The Sidewinder

By Victoria Caristo

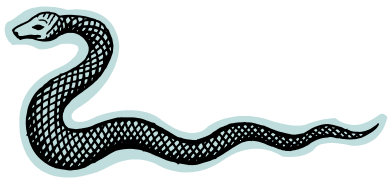
For most explorers, deserts can be one of the most beautifully natural formations known to man. Think about it; the great views of the open skies that seem to go on forever, the mountains that look as though they've been painted by the Earth itself, the unique plants, and let's not forget about the wild life that inhabits these beautiful areas. In our great Silver State, there are exactly five main breeds of snakes to be aware of; they are the Mojave, the Speckled, Western Diamondback, the Great Basin Rattler, and our main topic for this article, the Sidewinder.

Figure 1– Reference #7

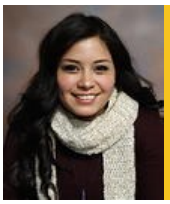
You hear *"Sidewinder"* and probably wonder how it got that name; personally, the name was enough to intrigue me. To kill your curiosity, this type of snake got its name based on the way it maneuvers around; it literally throws the body at a lateral angle and zig-zags. The interesting thing about the Sidewinder's movement is that only two sections of the body actually touch the ground. Therefore, this is a pretty fast moving snake, which is unnerving for people within close quarters, but this is a good thing for them because a sidewinders environment is nothing but hot, dry sand and their form of movement allows them to avoid touching that. These snakes are as unique as their name based on the way these snakes travel alone. Now, let us get into the breakdown of what this desert animal's ecosystem consists of. To start off, this type of snake is mostly common in more open parts of Arizona, California, northern parts of Mexico, Utah, and Pahrump (but it's common in other areas of Nevada as well). The diet is just like most desert snakes since they stick to small rats and lizards. In doing research, it seems like this snake is relatively calm in personality for being a part of desert wild life, but if you are bitten it would mostly be due to harassment towards the snake. The Sidewinder is fairly small, (only two to three feet in length) but don't let that fool you because the bite is extremely poisonous for humans. If you are attacked, one should get medical attention as soon as possible.

"Sidewinders are identified by horn-like scales above their eyes.."

Of course when you plan a hiking trip, it's always best to educate yourself about these potentially dangerous animals look like and where they may be found. Unless your trip consists of an evening hike to star-gaze, you won't come into too much contact with this primarily nocturnal reptile. Sidewinders are identified by horn-like scales above their eyes, and a color combination of pale and brown markings to help them to better blend in with their environment. Keep in mind that exploring the desert is a great activity for anyone of any age, but you have to remember that you're basically entering another species' home so it's best to educate yourself about how to identify certain animals and what their persona is like. Enjoy your desert hike and if you do come across some fascinating wild life, try to observe from a safe distance.



See References #7 Page 22



The Black-Tailed Jackrabbit

By Jessica Ceja

The desert is populated by a wide variety of animals. Each and every species has their own unique methods for survival, in addition to contributing to the environment in their own way. One of the many species that is quite common many desert environments is the Black-tailed Jackrabbit, known for their long ears and large hind legs. Despite the fact that the word rabbit is in their name, they are not rabbits.(2) They are in fact hares. The Black-tailed Jackrabbits are interesting and unique for a variety of reasons.

Besides the well known black ears and tail, they also have other interesting characteristics. The Black-tailed Jackrabbit can weigh from about 4-8 pounds, as well as measuring from 18-24 inches long.(3) In comparison of hares and rabbits, hares are much longer and larger. The Black-tailed Jackrabbit is considered a hare rather than a rabbit because their offspring are born with their eyes open and have a full coat.(4)

Animal characteristics play a huge part in their survival; in order for a species to survive they must learn to adapt to their environment. As a result their appearance will change over a period of several generations which favor that genetic appearance. The Black-tailed Jackrabbits' long ears help control their body temperature by either increasing or decreasing their blood flow through them. This allows them to cool off or warm up when needed.(4) The desert is made up of open areas which makes it easier for animals like the Black-tailed Jackrabbit to see predators. This also gives them time to escape as a survival technique. Their long legs help them run at up to 36 miles per hour, which is fast enough to outrun predators.(4) Another survival characteristic that helps these unique hares to survive is their coats. The color of their fur coats match the desert environment and helps to camouflage them. Their fur also comes into play with the heat. Their feet are covered with fur as well, helping them pad their feet against the scorching hot desert floor during the hotter months.(4) Other factors like their shelter and diet contribute to their survival as well.

In order to survive, all animals must consume and be sheltered properly. The Black-tailed Jackrabbit maintains a mostly green diet. They feed on plants such as leaves, grasses, alfalfa, clovers, seeds, beans, cacti, and twigs.(1) Interestingly, they digest their food twice. When they defecate, they consume their digestive waste.(4) The reason for this is to absorb as much moisture as possible and conserve water. The Black-tailed Jackrabbits hardly ever need to drink; they receive most of their water from the plants they eat.(4) As for shelter, these Jackrabbits enjoy resting in the shade of grasses and bushes when it's hot.(1) Unlike many other desert animals, Jackrabbits do not live in burrows.(1) As previously mentioned, they would much rather live in open areas instead.

The life span of a Black-tailed Jackrabbit is not very long. Their average life span of a wild Black-tailed Jackrabbit is between 2-5 years.(1) Due to their short lifespans, female Jackrabbits can deliver as many as four litters a year with three to four leverets (offspring). It is safe to say Jackrabbits are neither threatened nor extinct.(1)

"Interestingly, they digest their food twice."

The reason why the Black-tailed Jackrabbits continue to survive in their hot and hostile desert environments is a direct result of water conservation, camouflage abilities, and high yield of offspring. Water conservation being key because of the lack of water in the desert. When water is more abundant depending on the season, the hare populations will increase.

Figure 1– Reference #8 U.S. Fish and Wildlife

See References #8 Page 22

Impossible

By Dr. Rita Bagwe

If I were to ask you, "Will you find fish in Death Valley?" Most likely answer will be, "NO, It is impossible to find any living organism in Death Valley because it is the desert." It is impossible to survive in Death Valley because it is the hottest place on earth. It is located in North America and a temperature of 129°F was recorded on June 30th last year. Though it was still 5°F below its highest record of 134 °F (56.7 °C) reading, the hottest measured anywhere in the world on July 10, 1913.(1)

The reality is that seven species of pupfish have been surviving in not only the hottest, but also at the lowest point in North America.(2) Death Valley's Badwater Basin is the lowest point of elevation in North America at 282 feet (86 m) below sea level. It is difficult to imagine that this place was once cool, and filled with water from Lake Manly during the Pleistocene Epoch, where the ancestors of pupfish swam.(2,3) As the climate warmed, water from Lake Manly evaporated and formed many separate water pools, which restricted the population of the pupfish to isolation and left them to adapt themselves to the changing environmental conditions. This led to the development of unique characteristics. Over a period of time they evolved into several distinct species of pupfish, one of which lives in Devils Hole. (2,3)

Devils Hole pupfish, *Cyprinodon diabolis,* are the smallest of the pupfish species, and are considered endangered. They measure about an inch in length, and have an iridescent blue color. They have large heads and anal fins but lack pelvic fins.(4) They are limited to a cavern in the Devils Hole which is 35 feet long, 8 feet wide, and the depth is estimated to be over 500 feet. The bottom has never been mapped to date.(4) It is located within Ash Meadows National Wildlife Refuge in Nye County, Nevada. It is considered a detached section of Death Valley National Park.(6)

It is estimated that these pupfish were isolated in Devils Hole somewhere between 10,000 and 40,000 years ago. (4) Devils Hole is a window into the U.S.'s largest underground aquifer. Ancient water is found seeping to the surface of Devil's Hole. The water we see today at the surface literally took thousands of years to reach us. Devils hole is the only naturally occurring habitat in the world for this pupfish.(3) The resident pupfish of Devils Hole must withstand constant temperatures of 92°F and low dissolved oxygen which reaches near lethal limits for fish in that salinity.(5,6) They have to be near the water's surface to feed on rich algae and diatoms.

Figure 1– Reference #9

"Devils Hole is a window to the U.S's largest underground aquifer..."

They spawn in the shallow rock shelf found near the surface of the water and their larvae hatch there as well.(5) The number of pupfish continues to vary between the seasons with recorded counts of around 300–500 pupfish in the late summer when there is an increase in the algae production. In the winter, pupfish counts range between 100–200 pupfish, because the algae production slows down. Researchers suggest that algal growth increases when the barn owl (*Tyto alba*) roosts in the cave formation in Devils Hole. Their nutrient rich pellets increase the level of nutrition in the algae, which in turn, increases the algal population.(5) This shelf is shallow and during recent summers, the water temperatures have shown an increase from 93°F to 95°F. Researchers think that this increase could be linked to global climate change.(4) Devils Hole pupfish have been living on extreme temperature edges of what is known to be possible, but small changes to that environment might push them too far.

Continued on Page 15

Impossible– Continued

By Dr. Rita Bagwe

Aside from the increased temperature threats, the pupfish are also threatened from flash floods and earthquakes. Earthquakes occurring some 300 miles away are known to create "mini Tsunamis" which have been known to disrupt their fragile ecosystem. The pupfishes biggest threat has been groundwater depletion due to agricultural irrigation.(7)

In order to tackle this issue, in 1980 the U.S. Fish and Wildlife Service (USFWS) developed the Devils Hole pupfish recovery plan. Around 21,000 acres of land around Devils Hole was declared as an essential habitat. (5) Furthermore, in 1982 the USFWS listed two more pupfish species in Ash Meadows as being endangered, therefore conferring protection to all three levels of pools in the area.(5) Finally, in 1984 Ash Meadows National Wildlife Refuge was established.(5) In April 2013, USFWS reported only 35 pupfish remaining in Devils Hole, and in September the count increased to 65 pupfish. These record low summer and winter counts indicate that pupfish could now be at a significant risk and may become extinct in the near future.(6)

See References #9 Page 23

Nature Club Fun Photos

Images by Sarah Czipowski & Holly Brice

Desert Wildlife: Spotlight on the Lizard

By Kip Magee

When you think about lizards what comes to mind? A four legged green reptile that feeds on insects with a long tongue. Well I have some interesting information for you; lizards have a natural habitat among the brushes, debris, and wash. Their claws help them dig and run across the sandy, rocky areas. Most lizards will feed on buds, flowers, fruit as well as a variety of desert plants.

The Ash Meadows National Wildlife Refuge has over 20 known species of lizards. These lizards survive during the fall seasons in 40°F weather by burrowing in the sand and taking shelter underground. On hot sunny days, lizards like to rest on rocks to take in the sunshine. Lizards share the desert with many other wildlife species. The most dangerous predators in their environment are the birds. Their main line of defense is to run away or break off their tail if a bird gets ahold of them. Their tails will grow back in just a few weeks. Some lizards can run up to speeds of 18 miles per hour across the desert floor on two hind legs. Just a few true facts about lizards.

See References #10 Page 23

White Tailed Antelope Ground Squirrel

By Brionna Moore

The White Tail Antelope squirrel or in more technical terms the *Ammospermophilus leucurus,* is a creature that is medium in size that averages in 211mm in length and 105g in weight.(1) They have small rounded ears and relatively long hind legs compared to other ground squirrels. There is a sexual dimorphism which shows in males as being slightly larger than females. The main body of these squirrels range in colors from gray to brown, to a cinnamon like color. The tail is where these furry creatures get their names. The tip of the tail is dark or black and underneath of the tail is white. They molt their body pelage, or fur of an animal, twice a year, and their tail hair once a year. Their braincase is relatively flat with a well inflated skull bullae.(2)

A. leucurus is found in the Sonoran life zone. This region includes the southeastern part of Oregon, the southwestern part of Idaho and all of Nevada.(2) They are also found in almost all of Utah, western Colorado, northern Arizona, and New Mexico.(2) Their range of distribution also includes southeastern California, and most of Baja California (Mexico).(2)

A. leucurus do not hibernate or go dormant.(2) In extreme dry heat they can conserve water and use thermoregulation to survive.(2) This is thought to be attributed to their physiological, ecological, and behavioral adjustments. These creatures are diurnal, so you can expect to see them early mornings and late afternoons. *A. leucurus'* diet includes plants, insects, seeds, and vertebrate flesh making them omnivores.(2) They also have pouches in their mouth where they can store excess food.(2)

A. leucurus utilizes abandoned burrows from the Kangaroo rat and it is thought that these squirrels often utilize 6-7 in a five week period.(2) Breeding schedules differ according to the region that the Antelope squirrel lives in. For instance, in southern Nevada mating occurs between February and June, peaking in February and March. In comparison, California mating for *A. leucurus* occurs just in the first two weeks of March.(2) A litter of Antelope squirrel averages about 8 offspring, but can reach as high as 14. The average gestation is from 30 to 35 days.(2) Once a squirrel is born they will develop their adult pelage about 35 days after birth and are weaned from the mother at 65 days.(2) The average life span of *A. leucurus* is not well known.(3) In captivity the Antelope squirrel can live up to five years of age.(3) *A. leucurus* is not on the endangered species lists.(3)

Figure 1– By Brionna Miller

See References #11 Page 23

Tortoise Talk Followers

Late in Spring 2014 a group of individuals that had surfaced as non-members of Nature Club were given a rightful acceptance as Nature Club "Followers".

Followers have been a integral part of Nature Club as they are individuals or organizations that love to come to our guest speaker presentations and travel with the Nature Club. A Follower is an individual that is not considered a student at GBC and therefore can't be a recognized member. A Follower is allowed to come with us on trips, read and input on newsletters, attend guest speaker presentations and events, and be part of this amazing group of students.

There is no age limit so if you are 4 years old or 90 years old you can be a Follower. All that we ask of you is that you have fun and enjoy the journey. Thank you Followers for being awesome and supportive in so many ways!

Cracking Wise about fissures

By Professor Gregory Doyle

EARTH FISSURE - "*A long, open surface crack (generally on flat to gently sloping ground) in geologically unconsolidated sediments across which displacement is mainly perpendicular to the crack.*"

When it comes to fissures, there are probably as many natural processes and human activities that cause them as there are problems that they can cause. Some of the documented mechanisms for generating earth fissures include: Subsidence: Bending of layers at the ground surface by localized differential compaction caused by the withdrawal of underground fluids. Hydrocompaction: Failure of the intergranular structure of dry, collapsible soils when subjected to wetting. Void collapse: Piping and stopping of underground materials into mines, solution cavities and tunnels. Earthquakes: Earth fissure formation in response to fault rupture, liquefaction and strong ground motion.

Figure 1– By Professor Gregory Doyle

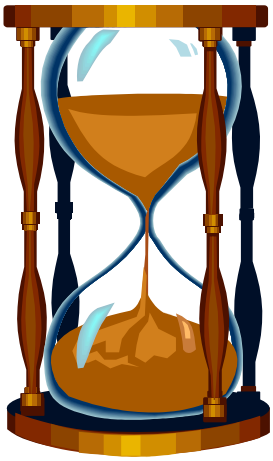
"A perfectly good reason to get out of the house-Earth Fissures"

Earth fissures resulting from groundwater pumping, aquifer deformation and subsidence are the primary source of fissure-related geotechnical problems in the arid Southwestern United States, and have accounted for tens of millions of dollars in structural damage. Closer to home, both the Las Vegas and Pahrump Valleys have been negatively impacted by earth fissures. Urban fissures not only cause the obvious structural distress and loss of property and dwellings, but frequently lead to other economic and social consequences, such as litigation and zoning changes.

Recently, some future geologists and I embarked on a day long adventure to observe some spectacular examples of earth fissures within the southern portion of Pahrump Valley. Not only did these fissures demonstrate the size that these features can attain, but getting to them provided for some fairly easy and fun mountain biking. It would appear that these are relatively older features, due to the extent that erosion has widened and partially backfilled them. Old or not, they are impressive to see!

What is Time?

By George Sausman, MBA, BS Eng.



The world famous astrophysicist and author Carl Sagan in his Introduction to Stephen Hawking's A Brief History of Time wrote, "We go about our daily lives understanding almost nothing of the world."(1) This is so true. We must admit that we cannot seem to define something so fundamental as time. We are aware of it. We can measure it. We can in some cases, comprehend its magnitude. Einstein combined its nature with that of what we also call space and developed ideas of space-time physics. We speak of an eternity, and mean a long time.

Someone says, "Wait a second," when we are in a hurry and they are not. In our concept of a short time period, we will say, "…it took only a fraction of a second and it was over," when a quick event occurred. When we speak of the past we say, "Last week, last month, last year, a million years ago." We do this as if we knew what we are speaking of in terms of a quantity. All of these common examples are references to the incremental measurements of a phenomenon we call time.

Well, just what is time? We can all agree that there are many fascinating features of the phenomenon. That is great, but still, what is it? Random House Webster's Unabridged give a nebulous definition. Science books sometimes define it as the interval between events. That seems to be the most descriptive exposition that is available.

Here is an example. We are going to travel by automobile from home to a city that is a measured a distance away (space). Let us take the distance from Pahrump Nevada to Baker, California, a distance that is about 87 miles. We are not uncomfortable telling our friends that are going to make that trip that it is slightly over an hour away (time). We have used time, as we understand it, to describe the events of leaving Pahrump and arriving in Baker. We have not given a measure of distance but instead given a measure of time. This is an example of space-time.

We are able to describe the sequence of events and provide a relative description of the duration between events without having a concrete definition of time. Does that mean that it does not exist? Of course not; we instinctively know that there is something that changes between the events we observe. While we cannot make a concise description of what that change is we can use the phenomenon to give us a parameter we can measure.

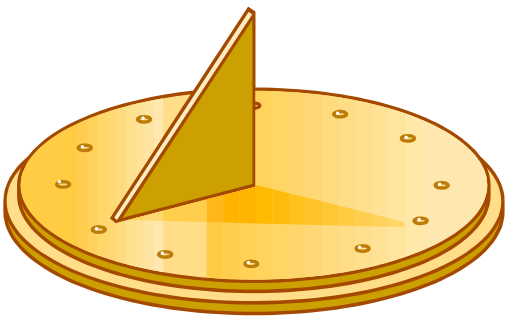
We, modern human beings, are not the first to look at the increment between events and develop a means to provide a measure of it. The ancients, in the time of the Babylonian Civilization, used the number 60 as the basis of their numbering system. That system carries over to us today in our measures of small portions of a circle, subdivided from degrees to minutes to seconds. Those are measures of angles (space).

Our measures of time are also in a base 60 or fraction thereof numbering system. The day was originally measured by use of a sundial which measured a circle that was divided into portions of equal segments of 24 units, we now call those units hours. Twenty-four is four tenths of 60. The hours are subdivided further into 60 portions which we name minutes. The minutes are subdivided further in to 60 portions which we name seconds.

With the advent of more precise measuring devices we have the ability to further divide the seconds by tenths, hundredths, thousandths,… nanoseconds, etc. We have had the ability for a long period of civilization to measure time in decades, centuries, millennia, eons, and periods. We even have the audacity to claim to be able to recon time to when the universe and our earth was formed.

That is pretty impressive. We can measure this phenomenon in all types of units, convert the measurement of it to distance, even use it to predict what will occur in future events. But, we still cannot definitely define it.

Just saying.



See References #12 Page 23

A Followers Appreciation

By Janis Collins

The Pahrump campus is fortunate to have the GBC Nature Club who welcomes "Followers" to their events, field trips, and meetings. As a "Follower" I have had the privilege to participate in a highly successful first ever bake sale held at the college, a popular basket raffle, and the opportunity to attend a few of the numerous field trips that were organized.

I am truly impressed by the enthusiasm of these volunteer naturalists. To see and be a part of this group actively exploring nature and exploring our unique natural ecology and history is inspiring. As a "Follower" I am learning new skills in natural resource conservation and restoration. Members and Followers are encouraged to join us to explore and discover the mystifying beauty of our local and surrounding areas.

Bird Identification

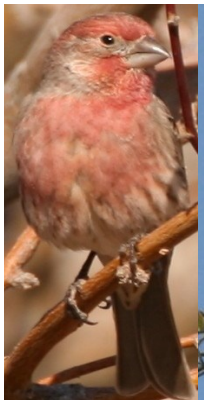
By Darlene Feener

Red Rock Audubon Society-West Branch-Education Chair (All photos are by Darlene Feener in this article)

ANNA'S HUMMINGBIRD: *(Calypte anna)* Size 4"

Behavior: Fast flight. During courtship will fly high in the sky, then dive to the ground making a popping sound. *Bill:* Long and straight *Color:* The male, has a rose red head and throat. A green and gray breast. The male and female are both bronze green above and grayish below. The female has a gray head and throat with some throat feathers showing a little red. *Shape:* Stocky *Tail:* Male is blackish gray and the female is black with white tips on outer feathers.

HOUSE FINCH: *(Haemorhous mexicanus)* Size: 5.7"



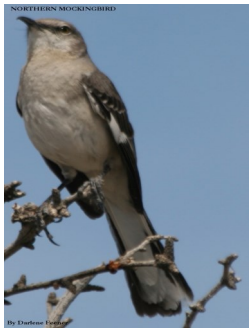
Male

Female

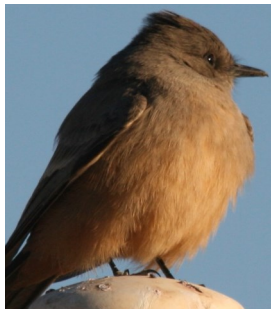
Behavior: Perches in the open on low or high trees and bushes. *Bill:* Conical and gray brown in both male and female. *Color:* The male has a red breast, red forehead, red throat and red rump. The underparts have grayish brown streaking. The female has no red. She is gray brown overall with gray brown streaking on underparts. Plain looking face. *Shape:* Stocky with a large head. *Tail:* Long brown with a slight notch at the end of the tail.

NORTHERN MOCKINGBIRD: *(Mimus polyglottos)* Size: 10"

Behavior: Loves to sing and mimic other bird songs. Often sings at night. Will fly at other birds that fly into its territory. *Bill:* Thin and long. *Color:* Gray black and white with two white wing bars and white patches on each wing. When the Northern Mockingbird is in flight you can see the flashes of white in its wings. White throat, white breast and white underparts. Upperparts are gray. *Shape:* Slender *Tail:* Long with white edges on the outside of a grayish black tail.



SAY'S PHOEBE: *(Sayornis saya)* Size: 7 ½"



Behavior: Fly's out from a perch to catch insects. Often returns to the same perch. *Bill:* Black flattened bill. *Color:* Grayish overall with buffy cinnamon belly and underparts. *Shape:* Big head with a slender body. *Tail:* Black fan shaped. Often wags tail.

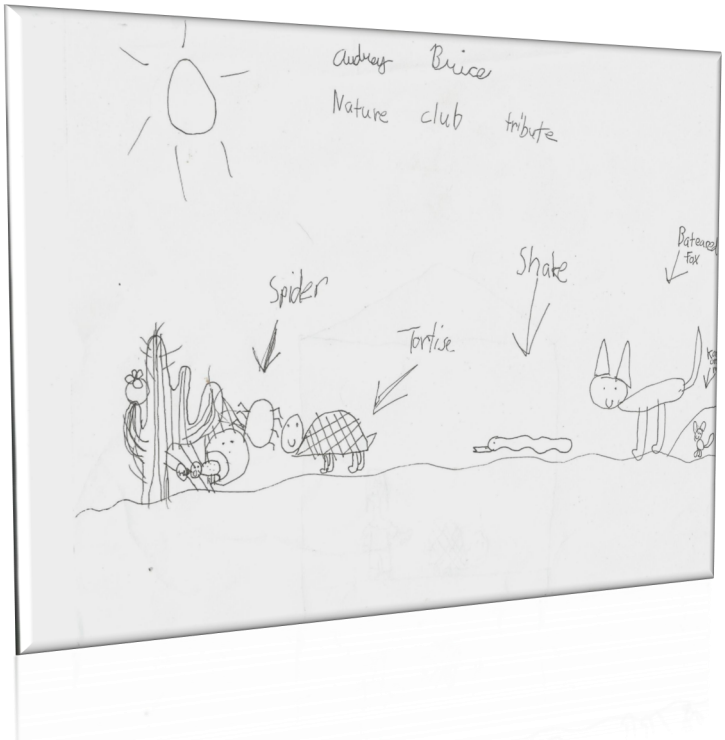
SONG SPARROW: *(Melospiza melodia)* Size: 6 ¼"

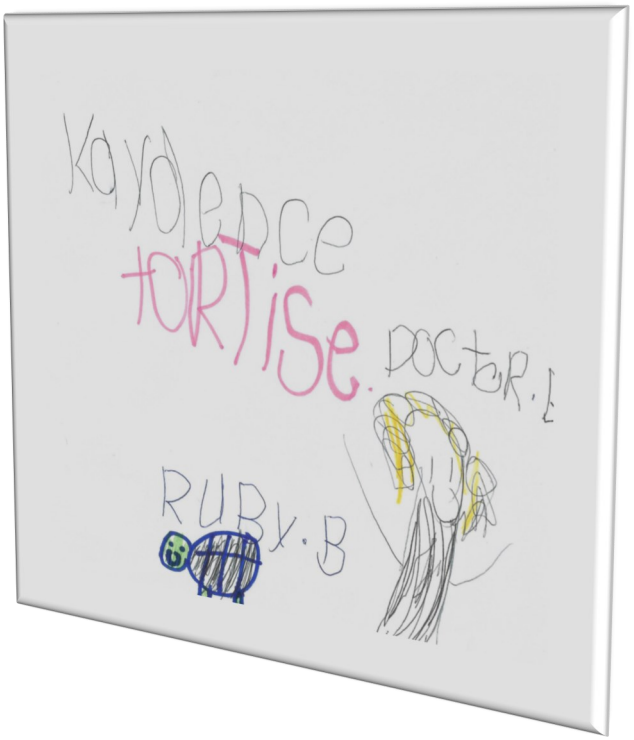
Behavior: Flies low moving from bush to bush. Has short fluttering flight. *Bill:* Stout and short. *Color:* Brown streaks on a white chest and dark malar stripes with a brown central breast spot. *Shape:* Bulky. *Tail:* Tail long and rounded. Pumps tail downward in flight.

Hatchlings

By Audrey and Kaydence Brice

As Nature Club involved it's many members, often we found that even the youngest members of our Followers wanted to participate. Whether it was on field trips, bake sales, or art work you can bet these little hatchlings would be there to support Nature Club with a smile on their face. Thank you to all the young friends out there that go on adventures with us. We hope to see you all next semester!





Word Search

ASH MEADOWS	PHAINOPEPLA	SOLPUGIDS
BIRDS	PUPFISH	SQUIRREL
CACTUS	ROADRUNNER	TIME
DEATH VALLEY	RUBY BETA	TORTOISE
DEVILS HOLE	SIDEWINDER	PAHRUMP
FLOWERS	GEOLOGY	JACK RABBIT
NATURE		

L S I S F B G K E Y Y J S W U
K W I O R E I S M E C A D V Y
Z E G D O E I R L Z S C I P F
P U Z L E O W L D H S K G U M
J D O H T W A O M S U R U P T
R G L R E V I E L V T A P F I
Y O O B H L A N E F C B L I M
O T A T S D O U D P A B O S E
P H A H O Q L H K E C I S H E
C E J W Y U U M S Y R T G R X
D F S U W V K I Q L L F U K M
R U B Y B E T A R S I T G X E
R E N N U R D A O R A V X W M
P M U R H A P I F N E F E A E
P H A I N O P E P L A L K D I

Trip & Activity Report

Trip Report

The first trip began with a *Shoshone bird walk* led by Len Warren, as the article by Ian Clark touched on. Mr. Warner taught us about the amazing habitat and migration patterns of the Phainopepla.

A trip to *Red Rock Canyon National Conservation Area* for a hike was in order. Beyond the visitors center there is a vast landscape that is littered with amazing wildlife and plants that one might not imagine could live here in the desert.

China Ranch Date Farm offered amazing insight to some of the history about the Armargosa River and its contribution to the surrounding environment we see today. We also stopped in for a date shake to cool off at the end. A trip you must make if you travel to the Date Farm.

Ash Meadows National Wildlife Refuge was a trip filled with awe and wonder. We saw the tiny pup fish that are endemic to these natural underground water sources, and enjoyed the beautiful scenery it provided.

We camped for one night in *Death Valley National Park.* It is only an hour and a half away but offered our minds more than was expected. The amazing high and low points were inspiring and breathtaking to see. The natural wonders that surrounded us amazed us from an educational perspective as well. To stand on the lowest point in North America and not be under a hundred feet of water will make any person appreciate nature and all its wonder. While we were there we also visited the famous Scotty's Castle and took a trip inside to see what life was like in the wild west.

The Valley of Fire and Shark Reef at Mandalay Bay was our last outing and certainly a great choice. To see the amazing rock formations and vibrant colors that took millions of years to surface is a geologists dream vacation. You can literally see the years in the rock formations. The Shark Reef was a nice stop on the way back from Las Vegas to get out of the heat as we begin to hit our warmer months. The amazing ocean life that dwells within is inspiring and a change of scenery from what we have been exploring these past two semesters.

Activity Report

Earth Day: We also participated in Earth Day at Ian Deutch Park this spring and introduced Nature Club to the local community. It was fun day out at the park with our neighbors the Red Rock Audubon Society and the Master Gardeners Association sitting with their booths right next to ours.

We had a fun bowling party for the members at the end of Fall 2013. Our mascot Ruby Beta was drawn by hand by Alysha Wogee and put on a t-shirt design by Jessica Ceja and Shelby Harris. Our webpage was created by Ian Clark, Adrian Aguilar, Holly Brice, and Jessica Ceja. This all of these facets taking place Nature Club truly came to life.

Aside from all of the things we did, each one of us took away a little more knowledge, understanding, and appreciation for nature and life in the desert. The special ecosystem that we all share is a delicate one and what impacts one species will most certainly impact another.

Looking Ahead

Spring 2013-Fall 2014 Nature Club says *Adieu* to the "Desert Life" theme as we shift to a 'water' theme in the following two semesters to explore.

Only great trips, awesome speakers, and fun times will be in store for these nature lovers as a new batch of board members will come on board at the end of this semester. Membership for the following semester will be limited to 20 students, however, there is a waiting list available and if you're not a student you can always join our followers group. Followers can join us on trips, participate in guest speaker events, and get e-mail updates and newsletters.

Next season holds a new chapter for Nature Club as we will begin to branch out and work not only on exploring a "water" theme, but also by giving back to nature through conservation efforts and finding ways to help the environment.

Trips planned are in the works but a visit to Hoover Dam, Zion National Park, Bryce Canyon, Great Basin National Park and others are being considered.

Only great things are headed our way so join in and let's go have some fun Nature Clubbers!

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