HERPETOFAUNA of the
APPLETON-WHITTELL RESEARCH RANCH
Special thanks to these individuals for the use of their excellent photographs to represent the herpetofauna of the Research Ranch. Photo credits are listed beneath each of their contributing photographs. Sean Carter, Erik F. Enderson, Tara Sprankle, Robert L. Bezy and Kathryn Bolles, Young D. Cage, Dr. Christian d’Orgeix, Dan Robinett, Jim Rorabaugh, Jeff Servoss, Linda Kennedy, Cecil Schwalbe, Joe Quiroga, David Hall and Kortney Jaworski.

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Herpetofauna of the Appleton-Whittell Research Ranch

This is a summary of observations and reports of the continued presence or absence of the herpetofauna which have been previously reported at the Appleton-Whittell Research Ranch. A total of fifty-four amphibian and reptile species have been reported within the Research Ranch boundaries. The continued existence of several species may be in doubt. Sightings of herp species are documented with time, date and location. Sightings of rare or uncommon species whenever possible are documented with photographs with specific points georeferenced. Wintering sites, primarily for crotalids are also sought out. Currently eight sites have been identified and documented.

The herpetofauna species accounts referenced are as follows:
- June – August 1982 compiled by Dodero, Mark and Spengler, John
- May 19 1987 updated species list author unknown
- October 23, 2002 updated list by Smith, Hobart M. and Chiszar, David
- October 2015 updated list by Cogan, Roger C.
- Tabular key to the Whiptail Lizards of Southeastern Arizona, Rosen, Phil

Nomenclature applied is from Society for the Study of Amphibians and Reptiles, Herpetological Circular No. 39, Seventh edition, 2012. Frogs originally described in the genus Rana have been reassigned and are now known as Lithobates. Most toads in the genus Bufo have been reassigned to the genus Anaxyrus. Sonoran Desert Toad originally described as Bufo alvarius was changed to Ollotis alvarius. It has recently been changed in 2012 to Incilius alvarius. Tiger salamander was originally described as Ambystoma tigrinum; the western race of this salamander is now under the designation Ambystoma mavortium. Whiptail lizards previously known as genus Cnemidophorus have been reassigned and are now known as Aspidoscelis. The Little Striped Whiptail (Cnemidophorus inornatus) has been reclassified to (Aspidoscelis arizonae). The Mountain Short-horned Lizard (Phrynosoma douglassii) has been reclassified to (Phrynosoma hernandesi). The Southern Prairie Fence Lizard (Scleroporus undulatus consobrinus) has been reclassified to Southwestern Fence Lizard (Sceloporus cowlesi). Whipsnakes in the genus Masticophis have reverted to their original description Coluber.

Measurements included are for average sized adult specimens, located at lower right of photographs. All amphibian and lizards are snout to vent measurements. Snake measurements are for total length. Turtle measurements are by carapace length.

References:
- Amphibian and Reptiles in Arizona by Brennan, Thomas C. and Holycross, Andrew T. Arizona Game and Fish Department, 2006.

All references to recent sightings are from 2006 to 2015. Observations reported from a known source are cited by reporter’s last name. (See appendix 1 pg. 59)
Amphibians: eleven species, of seven genera

Red-spotted Toad (Anaxyrus punctatus)
Woodhouse Toad (Anaxyrus woodhousii)
Sonoran Desert Toad (Incilius alvarius)
Couch’s Spadefoot Toad (Scaphiopus couchii)
Chihuahua Spadefoot Toad (Spea multiplicata stagnalis)
Canyon Treefrog (Hyla arenicolor)
Arizona Treefrog (Hyla wrightorum)
Tiger Salamander (Ambystoma mavortium) presence in doubt
Chiricahua Leopard Frog (Lithobates chiricahuensis) repatriated May 2015
Lowland leopard Frog (Lithobates yavapaiensis) extirpated
American Bullfrog (Lithobates catesbeiana) Non-native invasive
Red-spotted Toad (*Anaxyrus punctatus*)
Red-spotted toads have previously been reported along O’Donnell creek and in wet places with sandy soil. However they could occur in or near all of our major drainages. Due to exceptionally dry conditions in 2011 the only sightings had been near the Grassland Center and at staff and researcher quarters areas. No reproduction was reported in 2011. After summer monsoon storms in 2012 tadpoles and metamorphs were observed in north Post and Lyle creek (*Cogan, Kennedy*). No reproduction was reported in 2013. Reproduction was reported in south Post during July 2014 (*Carter, Cogan*). Reproduction was again reported in south Post during August 2015 (*Cogan*). It appears that reproduction for these toads occurs primarily in our creek streambeds with runoff from summer rains (*Cogan*). Surface activity is associated with summer monsoon rains; they are primarily nocturnal. They may also be observed during summer day-light hours when moist conditions are present.

Metamorphed red-spotted toad, south Post canyon July, 2014
Photo by Sean Carter
Woodhouse Toad (*Anaxyrus woodhousei*)

Woodhouse toad had not previously been documented in any accounts at the Ranch. Probability of their occurrence had been suggested by Hobart Smith, October 2002. During 2012, heavy monsoon rains filled water impound ponds east of the researcher quarters area in O’Donnell wash. Two species of toads, Chihuahuan spadefoot and Couch’s spadefoot gathered in the ponds for breeding (*Cogan, d’Orgeix, Lattanzio*). Woodhouse toads were discovered in the same ponds, the pictured male photographed and identification confirmed on July 19, 2012 (*Cogan, Lattanzio*). Woodhouse toad may also occur in other parts of the O’Donnell drainage. They are primarily nocturnal. There have been no other woodhouse toads reported since July 2012.
Sonoran Desert Toad (*Incilius alvarius*)
The Sonoran desert toad is the largest toad native to North American. The first confirmed record of this species on the Research Ranch occurred during July, 2006 (*Kennedy*). In recent years, specimens have been reported near the staff quarters and the researcher quarters (*Cogan, Kennedy*). It is likely they may be located elsewhere on the Ranch along our major drainages, primarily in association with sacaton areas. Desert toads are capable of remaining dormant for several years until favorable conditions return for surface activity which is usually only for a few brief weeks. Surface activity is usually during summer monsoon rains and is often associated with reproduction. Reproduction sites on the Ranch have not been identified. They are primarily nocturnal.
Couch’s Spadefoot Toad (*Scaphiopus couchii*)

Previous records for Couch’s spadefoot are from sandy bottom areas, especially in O’Donnell creek, east of the researcher quarters. There were no reported sightings in 2010-2011. During 2012 heavy summer monsoon rains filled ponds east of the researcher quarters. Previous records suggest that Couch’s bred in mass numbers in these ponds. However, in 2012 fewer than a dozen toads were observed breeding during this high water event (*Lattanzio*). There were no reported sightings of Couch’s during 2013. Heavy monsoon rains during 2014 brought breeding toads to the same ponds. Couch’s numbered only around six. Chihuahua spadefoot toads were the dominant species breeding in these ponds (*Cogan*). Monsoons during 2015 failed to produce suitable ponds and no breeding was reported.

Couch’s spadefoot toads could potentially be found at other locations at water impoundment ponds or temporary summer ponds which are preferred breeding sites. There does not appear to be a large breeding aggregation on the Ranch. However, on the Babacomari Ranch, north of the Vaughn wash crossing on Research Ranch road, on the west side of the road there is an impound pond that usually fills with water during monsoon. This pond routinely has a substantial population of toads that emerge to breed.
Chihuahua Spadefoot Toad (*Spea multiplicata stagnalis*)
Recorded sightings for Chihuahua spadefoot are from O’Donnell creek. Recent sightings include the Grassland center area and researcher quarters area. In 2011 one pond had breeding activity with eggs / tadpoles on the west side of the road, north of McDaniel well in the Turkey creek drainage (Cogan). This pond dried approximately two weeks after breeding occurred with no tadpoles surviving. During 2012 heavy monsoon rains filled water impound ponds east of the researcher quarters area. Chihuahuan spadefoot were the dominate species breeding at that location (Cogan, d’Orgeix, Lattanzio). The monsoons during 2013 failed to produce suitable ponds and no breeding was reported. Monsoon rains during 2014 brought toads to the bunkhouse pond to breed. However, the toads were not in the numbers witnessed in 2012 (Cogan). Monsoons during 2015 failed to produce suitable ponds and no breeding was reported. Spadefoot toads are capable of remaining dormant for several years until favorable conditions return. They could potentially be found at other locations on the Ranch where there are water impoundments or temporary summer ponds along our major drainages. Surface activity is usually during summer monsoon rains and is associated with reproduction. They are primarily nocturnal.
Canyon Treefrog (*Hyla arenicolor*)

Previous records of canyon treefrogs at the Research Ranch list them as isolated populations at Lyle creek, O’Donnell creek and upper Turkey creek. They have recently been reported, 2010-2015, at south Post canyon at both dam site locations and near adjacent rock pools (*Cogan*). Recent sightings at O’Donnell creek are upstream from the upper dam site (*Cogan*). Another location for recent sightings is the Grassland Center and staff quarters area (*Cogan, Kennedy*). Canyon treefrogs are cryptic in camouflage; often found fully exposed on the tops of rocks in or near water sources. They may possibly be found throughout our major drainages or at wildlife tanks where water and moisture are fairly constant. Activity can be anytime during warmer weather; they are both diurnal and nocturnal. It would appear that their preferred breeding sites are water filled rock pools formed during summer rains above streambeds with an absence of aquatic predators; sites have been located at south post canyon (*Cogan*). During monsoon storms in 2015 canyon treefrogs were observed calling / breeding in Post creek, between the two dams (*Cogan*).
Arizona treefrog (*Hyla wrightorum*)

This species had not previously been mentioned in any of the Ranch’s archives. The first specimen was found on April 15, 2015 in an unlikely location, southeast of the Grassland Center in the sacaton flood plain in O’Donnell creek (Cogan, Kennedy). There are known populations from the west side of the Huachuca’s and in the Canelo hills, in oak woodland habitat. This population is currently under review for possible listings as a threatened species by the USF&WS. Tadpoles may have washed downstream from Turkey or O’Donnell creek during summer high water events in 2014. However, a second frog was found nine days later on April 24, 2015 in Post canyon between the dam sites (Cogan). A third frog was found at the privately owned inholding home swimming pool on June 16, 2015 (Wilcox). A fourth frog was found July 22, 2015 in the back yard of the Big Adobe near HQ (Cogan). This riparian corridor could be appropriate habitat for this species; there is a possibility of a breeding population occurring in Post canyon.
Tiger Salamander (*Ambystoma mavortium*)
One specimen not identified to sub-species was reported on January 11, 2007 (*Hass*). It was found crossing Research Ranch road between the Grassland Center and researchers quarters. Tiger salamanders could potentially be found at any of our permanent water or damp locations. However, they would most likely be an introduced form, the Barred Tiger salamander (*Ambystoma mavortium mavortium*) and not the endangered Sonoran tiger salamander (*Ambystoma mavortium stebbinsi*). Literature suggests that surface activity would normally be during summer rains and are primarily nocturnal. The specimen pictured above was found during winter rains. It is unlikely that any persist with drier weather conditions in our area.
Species of special conservation concern in Arizona, both are totally protected by Arizona state law. In 2011 Chiricahua leopard frog (*Lithobates chiricahuensis*) were federally listed as a threatened species. Leopard frogs were not reported to be common species at the Ranch but were restricted to small, local populations. The locations cited were from Post canyon, upper O’Donnell creek and Finley tank, possibly occurring in Lyle creek and Turkey creek but not confirmed. The last known location for either species was the Chiricahua leopard frog at Finley tank (d’Orgeix). Neither species had been sighted for several years and were considered extirpated from the Ranch (Cogan). Leopard frogs were historically more common in southern Arizona when wetter conditions prevailed in cienegas, creeks, tanks, ponds and rivers. Drier conditions in the southwest, increased human use of water resources, introduced plants, bullfrogs and exotic diseases have decimated leopard frog populations throughout their range. Efforts are underway to reintroduce Chiricahua leopard frogs back into the Ranch ecosystem.
Chiricahua Leopard Frogs Return to the Ranch!

For several years the Ranch has been waiting patiently for our turn in the priority list to repatriate leopard frogs back into the Ranch ecosystem. On April 1, 2015 a meeting was held at Ranch HQ with AZG&FD and our surrounding neighbors to discuss inclusion in a Safe Harbor Agreement with AZ Game & Fish and the USF&WS. The SHA is a legal document to protect private land owners when threatened or endangered species recovery efforts are occurring on or near their properties. The Research Ranch entered this SHA in June 2015. The Ranch has two federal shareholders with parcels of land that Audubon manages. The Bureau of Land management and the US Forest Service, a SHA is not needed on federal lands. On May 26, 2015 Baldhill tank and Antelope well tank each received 110 Chiricahua leopard frog tadpoles on BLM property. On July 10, 2015 twenty five supplemental tadpoles were added to each of the water tanks. On July 25, 2015 the first tadpole morphed into a frog at Baldhill tank.
American Bullfrog (*Lithobates catesbeianus*) Non-native Invasive
It is the only vertebrate species at the Ranch (*aside from an occasional cow*), where efforts are directed to removing them whenever they are found. Previous efforts have contained their numbers. However, their removal is a continuing effort. Bullfrog dispersal into the Research Ranch from surrounding refugia occurs during high water events and moist conditions during summer monsoon rains. Activity can possibly be anytime during warmer weather, they are both diurnal and nocturnal. Recent occurrences of bullfrogs have been in south Post creek, O’Donnell creek, Telles tank and HQ pupfish pond (*Cogan, Kennedy*). A native to the eastern U.S., it is considered an invasive exotic in the western U.S. where it has either been intentionally or accidentally introduced. Bullfrogs have created havoc on small native aquatic and semi-aquatic wildlife wherever they occur in the west. With few predators to control their numbers and growing to a large size, they are able to eat anything that they can overpower. Bullfrogs are also known carriers of an infectious disease, (*Batrachochytrium dendrobatidis*) which can be devastating to native amphibian populations.
# Lizards

Lizards: Twenty species, of nine genera

<table>
<thead>
<tr>
<th>Species</th>
<th>Scientific Name</th>
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<tbody>
<tr>
<td>Arizona Striped Whiptail</td>
<td>(Aspidoscelis arizonae)</td>
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<tr>
<td>Canyon Spotted Whiptail</td>
<td>(Aspidoscelis stictogrammus)</td>
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<td>Chihuahuan Spotted Whiptail</td>
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<td>Desert Grassland Whiptail</td>
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<td>Eastern Collared Lizard</td>
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<td>Madrean Alligator lizard</td>
<td>(Elgaria kingii)</td>
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<td>Mountain Skink</td>
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<td>(Plestiodon obsoletus)</td>
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<td>Gila monster</td>
<td>(Heloderma suspectum)</td>
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<tr>
<td>Chihuahuan Earless Lizard</td>
<td>(Holbrookia maculata flavilenta)</td>
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<td>Greater Short-horned Lizard</td>
<td>(Phrynosoma hernandesi)</td>
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<td>Round-tailed Horned Lizard</td>
<td>(Phrynosoma modestum)</td>
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<td>Regal Horned Lizard</td>
<td>(Phrynosoma solare)</td>
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<td>Clark’s Spiny Lizard</td>
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<td>Slevin’s Bunchgrass Lizard</td>
<td>(Sceloporus slevini)</td>
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<td>Southwestern Fence Lizard</td>
<td>(Sceloporus cowlesi)</td>
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<tr>
<td>Ornate Tree Lizard</td>
<td>(Urosaurus ornatus)</td>
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Whiptail lizards, in the genus *Aspidoscelis*, are notoriously difficult to identify to species. These lizards are difficult or impossible to catch in the field, but are easily observed. The whiptails are characterized by widely fluctuating population levels, thus not all species listed may be seen on any given year. The Research Ranch has a tabular key compiled by Dr. Phil Rosen (*University of Arizona*) which is a great help in identifying this complicated group of lizards.

**Arizona Striped Whiptail (*Aspidoscelis arizonae*)**
Arizona striped whiptails are reported to be found in upland grassland areas. There are no exact location records listed for the Research Ranch. No recent sightings have been reported. If they still persist on the Ranch, this would be a distinct separate population from the rest of the species’ accepted range.

**Canyon Spotted Whiptail (*Aspidoscelis stictogrammus*)**
Also known as giant spotted, the canyon spotted is reported to be found in dense brush near water in riparian corridors. There are no exact location records listed for the Research Ranch. No recent sightings have been reported.

**Chihuahuan Spotted Whiptail (*Aspidoscelis exsanguis*)**
Chihuahuan spotted whiptails are reported to be found from desert grassland to oak woodland with the typical habitat as canyon bottoms in oak woodland. There are no exact location records listed for the Research Ranch. No recent sightings have been reported. If they still persist on the Ranch, this would be a distinct separate population from the rest of the species’ accepted range.

**Gila Spotted Whiptail (*Aspidoscelis flagellicaudus*)**
Gila spotted are reported to be found in upland grassland and oak woodland. There are no exact location records listed for the Research Ranch. No recent sightings have been reported. If they still persist on the Ranch, this would be a distinct separate population from the rest of the species’ accepted range.

**Sonoran Tiger Whiptail (*Aspidoscelis tigris punctilineatus*)**
Reported in drier portions of the Ranch, this species prefers open areas and avoids dense grassland and thick growth of shrubs. There are no exact location records listed for the Research Ranch. No recent sightings have been reported. If they still persist on the Ranch, this would be a distinct separate population from the species’ accepted range.
Sonoran Spotted Whiptail (*Aspidoscelis sonorae*)
Sonoran spotted is reported to be found in oak woodlands and riparian areas. There are no exact location records previously listed for the Research Ranch. During July and August 2011 they were commonly found in Clark wash north of the Grassland Center (*Cogan*). 2012 - 2015 they have been sighted near the Grassland Center, staff quarters and researcher quarters as well as the lower O’Donnell drainage area (*Cogan*).
Desert Grassland Whiptail (*Aspidoscelis uniparens*)

The desert grassland whiptail is the most often encountered and widespread whiptail lizard on the Ranch (*Cogan*). They are fond of open grassland and riparian areas. Commonly found in areas with scant cover of grasses and shrubs, they are often seen along roadways and in open areas near Ranch buildings. During late spring and summer sightings are common.
Eastern Collared Lizard (*Crotaphytus collaris*)
Collared lizards were reported to be common and widespread in rocky areas. There were no exact location records listed for the Research Ranch in historical records. In other locations within their range they are often visually apparent due to their basking behavior on mid-size to large boulders. Considering this behavior it would make them easier to locate. However, their behavior in grasslands may differ from other locations where the species is found. This collared lizard (*pictured*) was found and photographed on September 21, 2013, west of the Swinging H Ranch House (*Cogan*). On June 12, 2014, a second lizard was reported in the same vicinity (*Cogan*).
Madrean Alligator lizard (Elgaria kingii)

Madrean alligator lizards are reported at the Ranch in wet places, under rocks, dense plant growth and frequently found in old woodrat nests. Alligator lizards at the Ranch are widespread; they can be found in open grassland, woodland, riparian areas and often be found on roadways and around Ranch buildings (Cogan). Often considered to be nocturnal, they can be found abroad during the daylight hours especially towards sunset during summer months. During the monsoon season they may be a commonly encountered species, especially near Ranch buildings.
Mountain Skink (*Plestiodon callicephalus*)
Mountain skinks are reported to be found in Lyle canyon. Mountain skinks possibly could be found in other riparian locations at the Ranch. However, there have been no recent sightings.
Great Plains Skink (*Plestiodon obsoletus*)
Great Plains skink was reported to be found in fine grained soils below rock outcrops. No exact locations were listed. Great Plains skink possibly could be found in riparian and rocky situations throughout the Ranch.
On August 29, 2013 this juvenile (*top photo*) was found underneath a piece of plywood, east of the researchers’ quarters (*Cogan, Servoss*).
August 1, 2014, a second juvenile was reported found underneath a piece of sheet-metal near the same location (*Cogan, Prager*). July 10, 2015 a third juvenile was reported from O’Donnell creek upstream above the upper dam (*Hall*). Two hatchlings also were reported east of the Swinging H Ranch house (*Cogan, Prager*).
Gila Monster (*Heloderma suspectum*)
The Gila Monster and its relative to the south, the Mexican Beaded Lizard (*Heloderma horridum*) are the only known venomous lizards.
Gila’s are previously not mentioned in any accounts on the Ranch, although they have been reported in locations near our perimeters. A single specimen was finally reported crossing East Corrals road on May 20, 2014 (*Kugler*). This location on the road is now known as “Gila Bend”. A second individual was reported July 26, 2015 by Tony Leonardini, north of Headquarters in Clark wash on the west side of Bill’s bayou (*Leonardini*). The lower photo was taken on August 4th when the same lizard was found near the front porch of the Big Adobe (*Cogan*).
Chihuahuan Earless Lizard (*Holbrookia maculata flavilenta*)
Taxonomy of the genus *Holbrookia* and its six sub-species is currently under much debate. This lizard was originally reported on the Ranch as Lesser Earless Lizard (*Holbrookia maculata*). It was later reported (date unknown) as Chihuahuan Earless Lizard (*Holbrookia maculata flavilenta*), still considered to be a valid sub-species. Earless Lizards are widespread and found throughout the Ranch in open grassland habitat. During warm weather they are considered abundant. They are most often sighted in sandy washes and on roadways (*Cogan*). It is possible that we may have another species, the Elegant Earless Lizard (*Holbrookia elegans*) occurring at the Ranch as well as intergraded specimens (*Lattanzio 2009*). Further investigation is needed to sort out what species actually occur on the Ranch.
Greater Short-horned Lizard (*Phrynosoma hernandesi*)
Short-horned Lizards are widespread throughout the Ranch in open grassland, less frequently in riparian corridors. They are most often sighted in open areas especially on roadways. They may appear as nothing more than a flattish rock and are often at risk from moving vehicles. During the summer months they are a commonly encountered species at the Ranch (*Cogan*). Short-horned Lizards are a cold tolerate species and can be found in higher elevations (*up to 11,000 ft.*). They are also the only horned lizard that is live-bearing; other horned lizards lay eggs.
Round-tailed Horned Lizard (*Phrynosoma modestum*)
Round-tailed horned lizards at the Ranch are reportedly found in upland grasslands. There are no exact locations listed and there have been no recent sightings. If they still persist on the Ranch, this would be a distinct separate population, away from the accepted range for this species.
Regal Horned Lizard (*Phrynosoma solare*)
Regal Horned Lizards at the Ranch are reportedly found on rocky ridge tops; especially near harvester ant nests. No exact locations are listed. One possible sighting was reported on east Mesa but not confirmed (*Bock*). There have been no recent sightings. Populations of regal horned lizards near metro Phoenix and Tucson once abundant have been drastically reduced from urban development and the widespread use of insecticides.
Clark’s Spiny Lizard (*Sceloporus clarkii*)
Clark’s spiny lizards are found throughout the Ranch, in all terrestrial habitats. They are widespread and still considered abundant within the Ranch (*Cogan*). Spiny lizards are often sighted on large trees, dead tree trunks and snags, rocky areas in dry ravines and in riparian corridors. Spinys are also commonly encountered on and around Ranch buildings.
Slevin’s Bunchgrass Lizard (*Sceloporus slevini*)
Historic reports from the Ranch are from dry creeks near the Grassland Center to dry ridges above Turkey creek, on north Mesa and on sandy flats along O’Donnell and Post canyons. They were once considered abundant at the Ranch. Slevin’s are generally thought to be a higher elevation species (*above 5000 ft.*). Recent surveys at the Ranch as well other lower elevation populations have shown a drastic decline in their overall population numbers. A survey for Slevin’s conducted on the Ranch in 2011 had reported only four specimens (d’Orgeix). Incidental sightings during 2013 reported five specimens (d’Orgeix, Lattanzio, Cogan). During 2014, eight specimens were reported, four in different locations from previous sighting locations (d’Orgeix, Lattanzio, Cogan). During 2015, Slevin’s were reported in higher numbers and in new locations (Cogan). However, their continued occurrence at the Ranch may still be at risk. Further investigation is needed to determine reasons for their decline.
Southwestern Fence Lizard (*Sceloporus cowlesi*)
Southwestern fence lizard distribution throughout the Ranch appears to be patchy; favoring rocky areas and washes, they are also encountered in and around dead trees, brush piles, wood fence posts and around Ranch buildings, especially near the research complex. Although not widespread, in areas on the Ranch where they are found they may be considered common (*Cogan*).
Ornate Tree Lizard (*Urosaurus ornatus*)

Tree lizards are widespread and found throughout the Ranch in all terrestrial habitats. Tree lizards continue to be considered abundant. They are encountered on large trees, tree stumps and snags and are often seen around Ranch buildings. They also favor washes, gullies and ravines and rocky areas in riparian corridors (*Cogan, Lattanzio*). There is debate over sub-speciation. At the Ranch we have both the ornate tree lizard (*U. ornatus*) and the lined form (*U. ornatus linearis*). They are distinct in appearance, but are often found living sympatrically; (*U. ornatus linearis*) may prove to be a pattern variation.
Snakes: Twenty-one species, of twelve genera

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<td><em>Thamnophis marcianus</em></td>
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Western Diamondback Rattlesnake (*Crotalus atrox*)

Diamondbacks are widespread and can be encountered in all terrestrial habitats throughout the Ranch. They are most often encountered in or near washes, ravines, gullies and rocky areas. Diamondbacks are occasionally sighted near Ranch buildings and crossing roadways. Diamondbacks are most often encountered during warm weather and are considered to be abundant (*Cogan*).

Six wintering sites have been identified being utilized by diamondbacks (*Cogan*). Two sites are near O’Donnell creek, located 10-15 meters above the streambed. Three sites have been identified in Post canyon, 3-10 meters above the streambed and one site south of McDaniel well, in the Turkey creek drainage. Four of these identified sites are also utilized by black-tail rattlesnakes, two sites are utilized by Sonoran gopher snakes and Sonoran whipsnakes. Diamondbacks will also take advantage of other wintering sites which may be suitable. One individual was found in a rodent burrow at the base of a sotol plant, while another was found using a hole (*since repaired*) in the flooring of one of the older Ranch buildings (*Cogan, Kennedy*). In 2015, two females were found overwintering in a water valve box in the area near the research complex (*Cogan*).
Mohave Rattlesnake (*Crotalus scutulatus*)
Mohaves are widespread and found throughout the Ranch. Mohaves may be found in open grassland, dry washes, ravines and crossing roadways (*Cogan*). Mohaves are most often encountered during warm weather in open grassland areas of the Ranch and are considered to be abundant. In our area Mohaves appear to be particularly aggressive snakes (*Cogan*). Searches for possible wintering sites for Mohaves have been conducted 2010-2014 with no success. It is assumed that rodent burrows or thick brush cover at the base of trees and shrubs in open grassland are likely winter locations (*Cogan*).

This newborn Mohave rattlesnake (*pictured above*) emerged from the rodent burrow to the left while its mother and a sibling were retreating for cover down the same burrow. 08/07/2013
Banded Rock Rattlesnake *(Crotalus lepidus klauberi)*
A species of special concern in Arizona, they are totally protected by Arizona state law. Rock rattlesnakes are considered to be a high elevation montane species *(up to 9500 ft.)*, but will range into lower elevations *(4000 -4500 ft.)* favoring riparian corridors and rocky hillsides in oak woodlands. Previous records indicate that one specimen was reported in Post Canyon in the late 1980s *(Rosen)*. Rock rattlesnakes were suspected *(not confirmed)* to be found in upper Lyle canyon and Turkey creek. Recent sightings include one found in the recycle shed at headquarters on September 6, 2009, most likely from the Post canyon population *(Kennedy, Robinett)*. A second specimen was found on May 4, 2011 at O’Donnell creek upstream from upper dam *(Cogan, Robinett)*. A third was reported within Post canyon, summer 2009, no specific details *(Kugler)*. A fourth was reported in Lion Dip wash, north of the Post creek drainage. This snake was found coiled in an oak tree eight feet above the ground. *(Lattanzio, Jaworski)*. Rock rattlesnakes at the Ranch could possibly be found in other rocky locations in association with our major creek drainages.
Black-tailed Rattlesnake (*Crotalus molossus*)
Black-tails are reported to be found in rocky riparian corridors throughout the Ranch. Recent sightings have primarily been in O’Donnell creek and in Post canyon near the dam locations. During spring and early summer they are commonly encountered at both locations ([Cogan](#)). Five wintering sites for black-tails have been identified ([Cogan](#)). Four sites described for western diamondbacks ([page31](#)) are shared by black-tails. Another site exclusively utilized by black-tails in O’Donnell creek is located 3-5 meters above the creek bed ([Cogan](#)). On March 13, 2015, a single black-tail was reported in Lyle canyon in a possible location as a wintering site ([Cogan, Starrett](#)).

Female with newborn 08/30/2013 Post canyon
Regal Ringneck Snake (*Diadophis punctatus regalis*)
Ringnecks are grassland specialists and possibly could be found in all terrestrial habitats throughout the Ranch. They are most often encountered crossing roadways after summer monsoon storms while the ground is moist in early morning or late afternoon. Eight specimens had been sighted in 2011 (Cogan, Kennedy, and visiting researchers). During September 2012, five hatchlings were reported in several locations basking along our roadways (Cogan, Kennedy, and visiting researchers). Only one ringneck was reported in 2013 (Kennedy). During 2014 no ringnecks were reported. In 2015 a large adult was reported east of HQ (Kennedy) and a juvenile at Telles tank (Cogan). A third was reported on East Corrals road, near Gila Bend (Leonardini).
Chihuahuan Hook-nosed Snake (*Gyalopion canum*)
The secretive habits of Hook-nosed Snakes make them extremely difficult to locate. Hooknose snakes possibly may occur throughout the Ranch in oak woodland habitats in areas with heavy leaf litter and detritus. Only one specimen has been reported, near the research complex in 2008 (*Hass*).
Mexican Hognose Snake (*Heterodon kennerlyi*)

Hognose are reported to occur in loose sandy soils of floodplains and riparian areas. Hognose were suspected to occur in the O’Donnell floodplain in association with sacaton in the northeast section of the Ranch. However, none have been documented. One specimen was reported in 2009 on the road just north of the Research Ranch entrance (*Lattanzio*).
Spotted Nightsnake (*Hypsiglena chlorophaea*)
Reported to possibly occur anywhere on the Ranch; documented specimens were located near the Grassland center, central O’Donnell canyon and the old Appleton residence (*sources unknown*). Nightsnakes are likely to occur in rocky washes, ravines and riparian corridors where lizards are abundant (*Cogan*). Spotted nightsnakes are primarily nocturnal. There have been no recent sightings.
Desert Kingsnake (*Lampropeltis splendida*)

This species has only recently been added to the Ranch species list. The first specimen was reported in September 2003 (*Kennedy*) in sacaton grasslands at the northeast section of the Ranch. In 2009 one was reported near the researcher quarters (*Hass*). In 2011, a specimen was reported crossing East Corral road, north of the research quarters (*d’Orgeix*). Another specimen was reported on the front porch of the bunk house (*Jaworski, Lattanzio*). In 2015 a hatchling was found under a plywood board east of the bunkhouse and a juvenile was seen crossing East Corrals road (*Cogan*). Desert kingsnakes are grassland specialists and may possibly be found in other locations at the Ranch.
Western Black Kingsnake (*Lampropeltis nigrita*)
A black kingsnake was reported to be found on the Ranch in 1984 (*Dodero*). The location is not known. There are no recent confirmed sightings. However, it is possible that they still occur on the Ranch.
Arizona Mountain Kingsnake (*Lampropeltis pyromelana*)

Originally described as the subspecies *L. pyromelana woodini*, this is no longer considered valid. Considered to be a higher elevation species (*up to 9000 ft.*), mountain kingsnakes will range into lower elevations favoring riparian corridors and rocky hillsides in oak woodlands. Earlier records report them to be found at Turkey creek and Lyle canyon (*source unknown*). Sightings of two specimens in the O’Donnell Creek drainage occurred on July 6 and on July 15, 2011 (*Cogan, Kennedy*). A third specimen was reported in O’Donnell on June 13, 2013 (*Cogan*). June 7, 2015, an adult was reported in O’Donnell creek near the second creek crossing (*Simpson*).
Sonoran Whipsnake (*Coluber bilineatus*)
Sonoran whipsnakes were reported to be abundant in upper Turkey creek and O’Donnell creek. Recent sightings have been from open grasslands and riparian corridors throughout the Ranch (*Cogan, Kennedy, visiting researchers*). They are typically encountered crossing roadways and are considered common in our riparian corridors. Sonoran whipsnakes have been found wintering alongside rattlesnakes (*Cogan*).
Sonoran Coachwhip (*Coluber flagellum piceus*)
Sonoran Coachwhip (*above photo*), and Red Racer, *Coluber f. cingulum* are both reported to occur anywhere on the Ranch. The last confirmed report was in May, 2010, east of Headquarters in O’Donnell canyon (*Kennedy*), where a Coachwhip was seen crossing the road. It is also likely that Red Racer may still occur however, none have been confirmed.
Sonoran Coral Snake (*Micruroides euryxanthus*)
Records include one specimen from O’Donnell creek (*Bridgers*) and a second from an unknown locale (*source unknown*). They possibly could occur anywhere on the Ranch. They are suspected to be found on rocky hilltops and rocky ridges. There are no recent sightings. If coral snakes still persist on the Ranch, it is likely that their preferred food item, the Western Threaddsnake (*Rena humilis*) may also occur.
Sonoran Gopher Snake (*Pituophis catenifer affinis*)

Gopher snakes are often locally called bull snakes. The bull snake, *Pituophis catenifer*, is the species found in the mid-western U.S. Gopher snakes are widespread and found throughout the Ranch, in all terrestrial habitats. During warm weather they are commonly seen. Gopher snakes can be found crossing roadways and are often found around Ranch buildings. Gopher snakes have been found sharing wintering sites with rattlesnakes (*Cogan*).
Eastern Patchnose Snake (*Salvadora grahamiae*)
Eastern patchnose are widespread and found throughout the Ranch. Patchnose prefer open grassland areas and are often sighted while basking on roadways. They often remain motionless when approached and are at risk from passing vehicles. They are considered a common species. Patchnose are one of the first snakes to emerge during spring and one of the last snakes to be seen active before winter (*Cogan*).

Pictured (*top & bottom photos*) are two pattern variations of the eastern patchnose snake.
Western Patchnose Snake (*Salvadora deserticola*)
Western patchnose were suspected but not documented at the Ranch. Three road kill individuals were found in 2011 on the entrance road, north of the Research Ranch (*Cogan*). It is possible that they do occur and may yet be documented on the Ranch.
Western Groundsnake (*Sonora semiannulata*)
Western groundsnake has only recently been added to the Ranch species list with four specimens reported. In 2009, one adult was found at the staff quarters (*Kennedy*). The second was an adult on East Corral Road in 2011 (*Cogan*). The third was a hatchling west of the Ranch House in 2012 (*Cogan*). The fourth was a hatchling found inside the Grassland Center in 2013 (*Cogan*). They are likely to be common. However, due to their secretive life style they are not often encountered. Groundsnake color patterns are quite variable throughout their range; banded, striped or with little visible pattern. All groundsnakes reported at the Ranch have thus far have been this red and black banded pattern phase.
Black-necked Gartersnake (*Thamnophis cyrtopsis*)
Records report black-neck garters as a limited population, with no definite population sites identified. Black-necks are considered to prefer streamside and seep habitat situations. Recently, they have proved to be a widespread species and found throughout the Ranch, usually associated with but not restricted to moist situations (*Cogan*).
Northern Mexican Gartersnake (*Thamnophis eques*)

On August 7, 2014 Mexican garters were federally listed as a threatened species. Mexican garters have always been considered a rare snake at the Ranch. Records report them from O’Donnell creek, Post creek, Turkey creek and Finley tank. Relatively recent sightings at the Ranch were from Finley tank, where a small population persisted. They were last reported on August 9, 2009 at this location (d’Orgeix). The species decline has been linked throughout their range to the decline of their preferred food, leopard frogs which had been completely absent from the Ranch. However, during July 2012, a high water event occurred filling water impound ponds east of the researcher quarters. Spadefoot toads emerged for breeding in mass numbers. Researchers reported five adult Mexican gartersnakes having recently fed on spadefoot toads (d’Orgeix & student assistants), the first documentation of feeding on spadefoot toads. Three adult gartersnakes were reported in the same location during July, 2013 (Cogan, d’Orgeix). Monsoons in 2014 again filled the bunk house ponds and a small aggregation of toad breeding occurred. Two Mexican garters were reported from this site (Cogan, Prager). A third individual was reported from Finley tank (Carter, Cogan). In April 2015 three individuals were again found near the BH pond (Cogan, Cotton, & Mosley). A small population of garters is still present on the Ranch; the question to be answered is whether they are still reproductively viable.
Checkered Gartersnake (*Thamnophis marcianus*)

Checkered gartersnake had not been listed in our older records; however, they have been reported throughout the years with no cited locations. Recent sightings have been at the desert pup fish pond, south of the HQ, near the researcher quarters and near Clark wash (*Cogan, Kennedy and Lattanzio*). Checkered garters are usually found near moist situations, but often range some distance from water sources.

Ponds with toads breeding have a very narrow window of time during summer monsoon rains. Mexican, black-neck and checkered garter snakes will all take advantage of this food source. This checkered gartersnake is consuming a Couch’s spadefoot toad in a pond on the Babacomari ranch on July 15, 2014. (*Cogan*)
Turtles: two species, of two genera

Sonoran Mud Turtle          (Kinosternon sonoriense)
Desert Box Turtle           (Terrapene ornata luteola)
Sonoran Mud Turtle (*Kinosternon sonoriense*)
Originally identified at the Ranch as Sonoyta Mud Turtle (*Kinosternon sonoriense longifemorale*), this may have been in error since the only known populations of Sonoyta mud turtle are from Quitobaquito pond in Organ Pipe National Monument USA and in the Rio Sonoyta drainage in Mexico. Historic reports of abundance and occurrence at the Ranch are from deep pools in Turkey creek, Post canyon and O’Donnell creek. These populations still persist with an extraordinary population in the rocky pools in south Post canyon (*Cogan*). During summer monsoon rains, they can often be found well away from permanent water sources. They are capable of colonizing other permanent or semi-permanent water sources. In 2011 specimens had been sighted in Finley tank and in the pupfish pond immediately south of the Grassland center (*Cogan*). During high water events in 2012 and 2014 through the Post and O’Donnell drainages mud turtles may have re-distributed populations. Two specimens were reported in Telles tank on August 19, 2014 (*Cogan*). Mud turtles are capable of surviving dry periods buried in mud. If conditions contain enough moisture, they may establish themselves in new locations. Mud turtles are a species of special concern in Arizona.
Desert Box Turtle (*Terrapene ornata luteola*)
A species of special concern in Arizona, they are totally protected by state law. Historic reports of occurrence cited box turtles as widespread in sandy soils along stream courses. Recent sightings have been near lower O’Donnell creek in association with sacaton (*Cogan, Kennedy, Robinett and visiting researchers*). Four adults were reported and a juvenile was located in 2011, a good indicator that recoupment does still occur (*Cogan*). However, sightings have decreased slightly since 2011. Three adults were reported in 2012 and in 2013; during 2014 only two adults were reported (*Cogan, Kennedy, and Robinett*). During 2015, only two were reported (*Cogan*). The reduced sightings may be due to erratic weather patterns. Box turtles have also been occasionally found on the road north of the Research Ranch boundary in association with Vaughn creek drainage. Individuals found are reported to AZGFD for the Box Turtle survey program.

Juvenile box turtle found on the road near O’Donnell wash, 2011
Appendix 1

Individuals reporting species observations and their position at time of reporting:

Bock, Jane (*Professor Emerita, University of Colorado*)
Bridgers, Nakiesha (*Virginia State University, student 2007*)
Carter, Sean (*Audubon’s Apacheria Fellowship Recipient 2014*)
Cogan, Roger (*Conservation Program Manager, Audubon Research Ranch*)
Cotton, Taylor (*AZG&FD non-game biologist*)
Dodero, Mark (*Researcher mid 1980’s*)
d’Orgeix, Christian (*Researcher Ph.D., Virginia State University*)
Hall, David (*Frog Project*)
Hass, Christine (*Ph.D. Assistant Director, Audubon Research Ranch*)
Kennedy, Linda (*Ph.D. Director, Audubon Research Ranch*)
Kugler, Pat (*Office Manager, Retired, Audubon Research Ranch*)
Jaworski, Kortney (*Audubon’s Apacheria Fellowship Recipient 2015*)
Lattanzio, Matt (*Ph.D. Christopher Newport University*)
Leonardini, Tony (*Volunteer Avian Researcher, Audubon Research Ranch*)
Mosley, Cody (*AZG&FD non-game biologist*)
Prager, Steven (*Audubon Arizona Teacher/Naturalist*)
Robinett, Dan (*Rangeland Management Specialist, NRCS Retired*)
Rosen, Phil (*Ph.D. University of Arizona, Researcher*)
Servoss, Jeff (*USF&WS*)
Simpson, Richard (*Ph.D. candidate, Arizona State University*)
Starrett, Bryan (*Zoo Herps, consultant*)
Wilcox, Kyle & Suzanne (*inholding neighbors*)

All species reported by visiting researchers are considered valid with positive identification or photographs.