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Ecological Features of the Greater Earless Lizard, Cophosaurus texanus, (Squamata: Phrynosomatidae) on Indio Mountains Research Station, Hudspeth County, Texas

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ECOLOGICAL FEATURES OF THE GREATER EARLESS LIZARD, COPHOSAURUS TEXANUS, (SQUAMATA: PHRYNOSOMATIDAE) ON INDIO MOUNTAINS RESEARCH STATION, HUDSPETH COUNTY, TEXAS

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by

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Abstract

626 *Cophosaurus texanus* were captured on regular trips to Indio Mountains Research Station in Hudspeth County, Texas from August 2010 to November 2014. Mark-recapture methods using 81 pitfall traps and toe-clips for identification allowed for analyses of long-term trends. 291 adult females, 315 males, and 20 unsexed juveniles were recorded. A total of 180 independent recapture events were documented over the study period (44% females; 55% males). The greatest numbers of *C. texanus* were collected in 2011 (234), which was also the driest year of the four (6.77 cm), whereas 2014 was the wettest (34.95 cm), but had the second-most number of captures (144). The average temperatures for all the years was not significantly different, although maximum and minimum temperatures varied (2011: 34.95°C, -12.94°C; 2012: 33.15°C, 1.61°C; 2013: 33.08°C, -2.24°C; 2014: 33.85°C, -5.85°C).

Males had an average SVL of 58.27 ± 0.8 mm and an average mass of 7.12 g ± 0.25 g (range: 0.4 – 19.5 g), while females averaged 51.45 ± 0.64 mm SVL and had an average mass of 4.8 g ± 0.15 g (range: 0.2 – 12.3 g). There was a positive correlation between seasonal temperature and the growth rate for mass. SVL was significantly correlated with monthly precipitation, monthly and daily wind speed, and mean monthly and daily temperatures. Increase in mass was significantly correlated with monthly and daily temperature as well as monthly precipitation. Body condition was significantly correlated with monthly mean temperature, but precipitation amount was not significant for SVL, or body condition. Throughout the study, females had a higher body condition index than males ($p = 0.0025$), while males had larger growth rates ($p = 0.0315$). There was no significant difference between combined yearly body conditions or for yearly body conditions by sex.

There were no significant differences between captures or recaptures of males and females over the study period. During the entire study period, 3,550 ectoparasitic mites were counted on all captured and recaptured lizards. By year, the highest number of mites found on both sexes combined was 1,736 in 2011. There was no significant yearly difference among sexes in mite infestation except between 2011 and 2013 ($p = 0.0117$). The two most infected body locations for both sexes were the cervical and sacral regions.

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INTRODUCTION

Investigations of natural populations of reptiles are uncommon, yet essential to understanding ecological and temporal responses to the environmental conditions of a study area. Descriptive studies into the natural history and annual patterns of a species in a specific region of its range are important contributions to the knowledge of the species as a whole. It is especially critical to better comprehend a generalist species like the Greater Earless lizard, *Cophosaurus texanus* (Figure 1) which can be referred to when examining similar or closely related species. *C. texanus* is endemic to southern Arizona and New Mexico, and west Texas in the southwestern United States, with its range extending southward into Nuevo Leon of northern Mexico.

Cophosaurus texanus is an ambush forager and both adults and juveniles can be seen perched on rocks awaiting prey or basking in sunlight; although they quickly retreat from potential predators in a zig-zag fashion with their striped tail curled over their backs while wagging the end to distract nearby threats from the rest of the body. Lizards also perform conspicuous displays of raising and lowering the body (push-ups) and head bobs for attracting or warning other lizards of their presence. *Cophosaurus texanus* is diurnal and endemic to the southwestern United States and northern Mexico, and is very abundant on IMRS. It is a medium-sized lizard with females reaching over 70 mm SVL (snout-vent length) and males rarely reaching over 85 mm SVL (Howland, 2009). Reproductive season is typically late April through August on IMRS, which is when sightings of males increase due to elevated activity in mating and territorial displays, such as push-ups and head bobbing. Males (Figure 1) are sexually dimorphic with orange, yellow, and blue venter and dorsal spotting. Females (Figure 1) have a peach or pink hue when gravid and will lay about three clutches of two to eight eggs per year (Ballinger et al., 1972), thereby generating an influx of juveniles into the population throughout

the warm activity season. On Indio Mountains Research Station, *C. texanus* is sympatric with at least 13 other lizard species including: *Aspidoscelis exanguis*, *A. inornata*, *A. marmorata*, *A. tesselata*, *Coleonyx brevis*, *Crotaphytus collaris*, *Phrynosoma modestum*, *Plestiodon obsoletus*, *P. tetragrammus*, *Sceloporus cowlesi*, *S. poinsetti*, *Urosaurus ornatus*, and *Uta stansburiana.* (Worthington et al., 2014).

FIGURE 1. Adult male (left) and female (right) *Cophosaurus texanus* from Indio Mountains Research Station, Hudspeth County, Texas.

Cophosaurus texanus is the most commonly encountered lizard on IMRS, occupying mostly desert flats and foothills with gravel to rocky substrates (Couvillon, 2011). Degenhardt et al. (1996) and Lemos et al. (2007) mentioned an elevational restriction of 250 – 1545 m, of which the landscape of IMRS more or less falls within (elevational range: 900 – 1600 m). The species is known to exploit open to densely vegetated habitats (Punzo, 2007) utilizing coverage provided by plants to achieve thermal regulation more efficiently. To cope with increased ambient and surface temperatures, this species also "dives" to cooler depths within loose substrates using serrated labial scales and a swimming motion while flattening the body

dorsoventrally. *Cophosaurus texanus* was also observed taking refuge inside shallow roadside berms at night and could be seen quickly escaping after driving vehicles close to the location where they were buried (personal observation). Heat from the sun disseminates through layers of soil at a slow rate, therefore temperature fluctuations diminish beneath the surface. Midday heat moves through soil in pulses so that during the day when the surface is warmest, 15 cm below the soil is up to 20° C cooler, and vice versa at night (Sowell, 2001).

The Chihuahuan Desert is the largest desert in North America, occupying parts of Arizona, Texas and New Mexico in the United States of America, with the majority of the range being within the Mexican states of Chihuahua and Coahuila (Figure 2). This desert is referred to a “rain shadow desert” because of the Sierra Madre Occidental mountain range of Mexico blocks moisture from the Pacific Ocean and the Sierra Madre Oriental blocks moisture from the Gulf of Mexico; most moisture from the nearest water sources is released before reaching the Trans-Pecos region of Texas in the northern Chihuahuan Desert. Examples associated with Texas indicate that the coastal city of Galveston gets about 106.7 cm of rain a year; Sonora, located 340 miles further inland receives about 55.9 cm; and Pecos, 500 miles away from the coast receives about 29.4 cm annually (The Climate of the Chihuahuan Desert, 2012). Rainfall data from Van Horn, Texas, 40 km north of Indio Mountains Research Station (IMRS), indicates IMRS is slightly drier in comparison and is also affected by a mild rain shadow effect from the Eagle Mountains bordering on the west that leads to a more arid environment, as well as the Rio Grande River directly south. The Chihuahuan Desert normally receives more precipitation than other North American desert ecoregions during the “monsoon season” (June – September), but less during winter in the form of sleet, hail, or snow. Northern arctic fronts bring frosts and freezes during winter, and hot temperatures prevail during late spring and summer, therefore

native organisms must be adapted to both extreme heat intensity and cold temperatures during the annual weather cycle.

A future warmer and more arid climate in the southwestern United States will affect plant viability, especially those that will respond negatively to drought (Munson and Reiser, 2013). Most arthropods, the primary food source of *C. texanus* (Degenhardt *et al*., 1996; Maury, 1995), depend on particular plant species for their welfare and may be forced to either adapt to new plant species for food, disperse to new areas, or if not, their populations will ultimately decline. When temperatures increase, reproductive potential for arthropods per year is expected to increase due to a reduction in gestation periods, (Brantley and Ford, 2012) which leads to more offspring per season expected, directly increasing prey availability for lizards and other insectivorous organisms. Environmental factors, such as temperature, affect the growing season for lizards (Bashey and Dunham, 1997) because of their ectothermic limitations on metabolism and foraging activity. Most lizard abundance is expected to increase during summer when temperatures and precipitation are highest, which in turn produce a greater supply of prey items. Females are expected to have a higher mass during reproductive season due to egg production rather than growth (Paulissen et al., 2013). Paulissen's study also supports that increased rainfall should result in increased lizard growth rates. *C. texanus* is also commonly parasitized by chiggers (*Eutrombicula alfredugesi* and *Acomatacarus arizonensis*) which have digestive enzymes to consume the skin cells of various birds, mammals, reptiles, and arthropods as larvae. After feeding, the larvae drop and mature into adult non-parasitic soil mites. This study will explore the quantity of mites attached to various locations on the bodies of captured lizards.

Many previous studies on *C. texanus* explored aspects of dietary habits, general life history traits, and reproductive biology (Ballinger et al., 1972; Engeling, 1972; Maury, 1995; Shrank and Ballinger, 1973; Smith et al., 1987; Sugg et al., 1995). However, most studies on this species have been conducted in the eastern Big Bend region of Texas, a different ecological region of the species range than IMRS in western Texas; fewer studies examine abundance and activity in relation to environmental trends using mark-recapture techniques over consecutive years; and no studies have previously observed the ecology of the most frequently encountered species, *Cophosaurus texanus*, in detail on IMRS.

Information gathered through studies using pitfall traps that captured several lizard species on IMRS during the last 10 years by Jerry D. Johnson and students (e.g. Johnson et al., 2004; Mata-Silva et al., 2008; Mata-Silva et al., 2010a; Mata-Silva et al., 2010b; Mata-Silva et al., 2013), indicated that *C. texanus* generally exhibits earlier emergence dates and later winter retreat dates than other local lizard species, in addition to having higher capture/recapture rates. This long-term collection of mark-recapture data allowed for more in depth ecological questions on *C. texanus*; those questions are as follows: 1) Do growth rates and body condition of males and females differ in relation to environmental trends? 2) Do growth rates of the combined population differ in relation to environmental trends? 3) What are the annual activity patterns and recapture rates? 4) Where on the body are ectoparasitic mite infections located and is there seasonal variation in parasite locations and over all loads?

Materials and Methods

Description of Study Site

Most of the information on IMRS was taken from Johnson (2000), Couvillon (2011), Worthington *et al*. (2014), the IMRS website (www. utep.edu/indio), and personal observations. IMRS is located in southeastern Hudspeth County, Texas, with the study plots near the headquarters being about 40 km southwest of Van Horn (Figure 2). The two sampling sites used were: Indio Ranch Headquarters (HQ) (30.77688°N, 105.01617°W; 1235 m elevation) and an adjacent site, Prospect Pits (PP) (30.77189°N, 105.01123°W; 1248 m elevation); both are located in the central section of IMRS. Vegetation is typical Chihuahuan Desert scrub and desert grassland, including the following numerically dominant species: Creosotebush (*Larrea tridentate*), Ocotillo (*Fouqueria splendens*), Honey Mesquite (*Prosopis glandulosa*), Western White-thorn Acacia (*Acacia constricta*), Catclaw Acacia (*Acacia greggii*), Plumed Crinklemat (*Tequilia greggii*), numerous cacti, Eve's Needle (*Yucca faxoniana*), Lechuguilla (*Agave lechuguilla*), and numerous seasonal herbaceous forbes interspersed with Black Gramma (*Bouteloua eriopoda*), and Fluffgrass (*Dasyochloa pulchella*) (Couvillon, 2011). An abundance of invertebrates, especially spiders and insects, and numerous flowering plants have been recorded on IMRS that represent available prey-rich assemblages for insectivorous lizards, such as *C. texanus*.

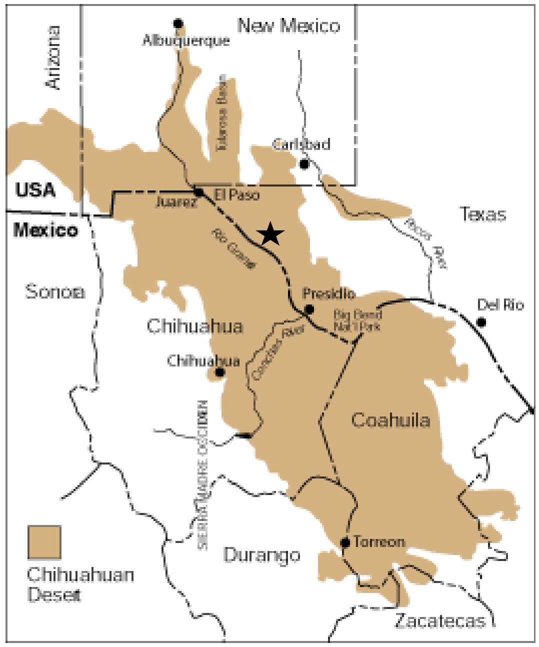

FIGURE 2. Location of Indio Mountains Research Station (indicated by a star) in Hudspeth County, Texas. The dark shading is the approximate area included in the Chihuahuan Desert (after Schmidt, 1979).

IMRS HQ area is dominated by conglomerate slopes and limestone hills. The facilities buildings are located at 1235 m elevation on a gently western-sloping alluvial fan. Fifty-one pitfall traps positioned there (Figure 3) are located between and within arroyos, and on alluvial fans. The most anthropogenic disturbance takes place at this site due to vehicular and utility demands, noise, and other forms of pressure caused by foot traffic. The 51 traps are distributed as seven linear transects of six traps, and one transect (transect 3) with nine traps (Figure 3).

Prospect Pits (PP) is an ecologically similar site located about ½ km southeast of HQ. Thirty pitfall traps are within and atop arroyos, in five parallel transects with six traps each, oriented west to east at ca. 1234 m elevation (Figure 3). This site has alternating arroyos and open alluvial fans near the bottom of a steep cliff face.

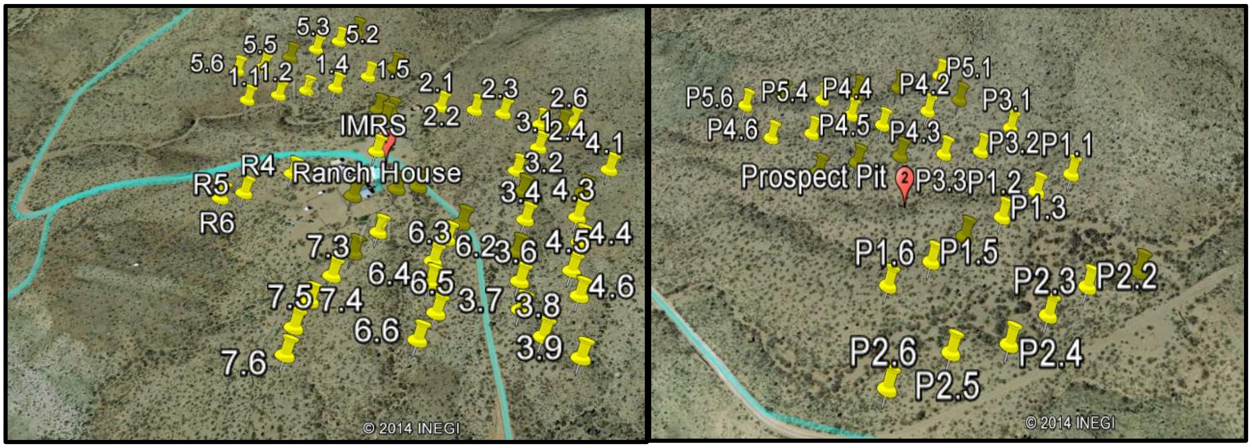

FIGURE 3. Distribution and orientation of pitfall transects (represented by yellow pins) at Ranch House site (left) and Prospect Pits (right) viewed from Google Earth. Similar terrain and desert scrub vegetation is present at both sites.

Environmental data (temperature, precipitation, wind direction and speed) was automatically recorded in fifteen minute increments by an on-site Campbell Scientific weather station adjacent to HQ. Data was downloaded periodically directly from the weather station as a Microsoft Notepad file and then was imported into a Microsoft Excel file for management. In Excel, a formula was used to convert downloaded Julian calendar dates into Gregorian calendar dates using methods by Pearson (2013).

Collection and Processing

Lizards were collected by William D. Lukefahr (Lukefahr, 2013) during periodic trips to IMRS from August 2010 through May 2012, and in conjunction with Gabriela R. Franco from June 2012 through October 2013; Franco continued data collection through December 2014. Most trapping was from Friday afternoon through Saturday evening or Sunday morning, although severe weather conditions would periodically force trap closures. Traps used to sample

lizards were spaced 20 m apart and included 81 buried five-gallon buckets with screw lids and square wooden covers propped up using four 2 x 4 boards (Figure 4). The square wooden covers over open buckets are needed to protect lizards from severe overheating by solar radiation and sudden rainfall events. The shade under the boards also tends to attract running lizards that fall into the trap while seeking protection from predation or overheating. Each bucket was labeled with transect and trap number on the inside and inner lid with a permanent marker.

FIGURE 4. Pitfall trap type used to capture lizards IMRS during this study.

Lizards were removed from the bucket by hand, placed in individual re-sealable plastic bags marked with transect and trap numbers, date, and time, and then taken to the IMRS laboratory for processing. GPS coordinates (decimal degrees) were also recorded for any hand-caught or noosed lizards found near transects or around HQ facilities. Determining sex of *C. texanus* was confirmed when possible by observing femoral pores and two enlarged post-anal scales in males if hemipenes were not readily detected, which is especially important for juveniles that exhibit less sexual dimorphism in color patterns than adults (Stebbins, 2003).

Snout-vent length (SVL) and tail length (TL) were measured in millimeters with a transparent ruler so that measurement marks were more accurately read. Mass was measured to the nearest 0.1 gram by tarring an empty re-sealable plastic bag on a digital balance before placing the lizard inside for final weighing. The number of visible ectoparasitic mites on each location of the body (Figure 5) were counted using a dissecting microscope and recorded. Identifiable toe clips were recorded, which were later matched to an identification code for the individual lizard's processing history; the lizards received no further procedures after this and were released at original point of capture the next time researchers visited traps each day.

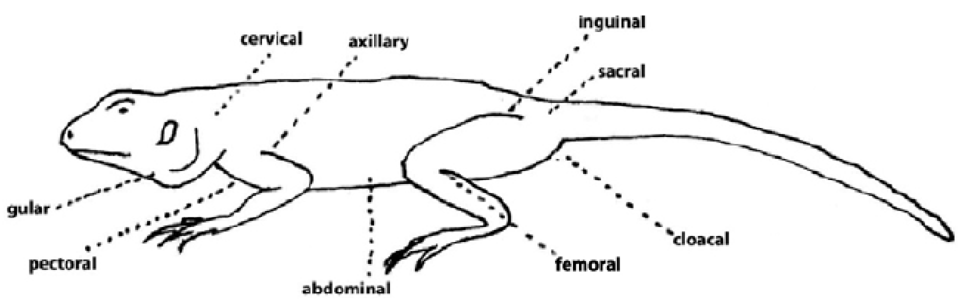

FIGURE 5. Lizard body locations for mite infection used in this study.

A unique specimen ID was assigned if the individual had no toes clipped; those that did were considered recaptures. Toes to be clipped were determined using a numerical matrix with values assigned to each individual. A different matrix was used depending on site, species and sex following methods of Tinkle (1967; Figure 6) and determined to be an appropriate method by Ferner (2007).

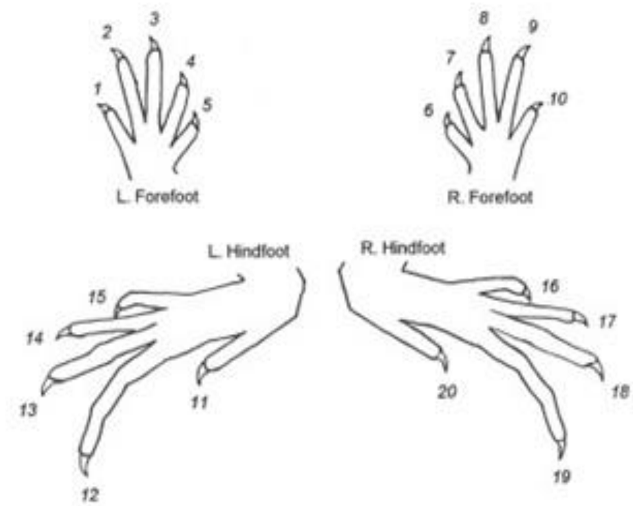

FIGURE 6. Lizard toe clip numbering system (Tinkle, 1967) used in this study for mark/recapture analyses at IMRS.

After marking the matrix, the proper toe(s) were identified on the lizard and, using a small pair of dissecting scissors, were cut approximately 3–4 mm from the tip of the digit. The toes were immediately placed in a 5 ml screw-lid centrifuge tube containing a solution of 95% ethanol solution for future molecular analysis. Tubes were then labeled with corresponding identification code (e.g., GRF900) using a permanent marker. If the lizard's severed toe began to bleed, pressure was applied to the site followed by treatment with a small amount of liquid skin adhesive. All hard-copied lizard data were transferred to, and updated in, an electronic Microsoft Access database. Each individual's toe clip number(s) are recorded in a box and checked off the matrix based on capture site (e.g., HQ; PP) and sex. Rarely, if a lizard could not be confidently sexed, a toe clip that was unassigned to either sex for the site was issued, and the box circled for both sexes to ensure no two individuals of the same sex and a site acquired the same toe clip number(s). If that lizard was recaptured, sex determination would be attempted again, and if successful, the opposite sex at that site would become available and the toe clip matrix and

electronic database updated with the data for the sexed individual. After completing the processing, lizards were released at original point of capture the next time researchers visited traps. The protocols used in this study were approved by the UTEP Institutional Animal Care and Use Committee (A-1940).

Statistical Analyses

A multivariate linear regression was applied to determine relationships between snout-vent length growth rates and mass growth rates using the following variables: temperature, precipitation, wind speed, and body condition. Growth rate for snout-vent length was calculated for each lizard with at least one recapture event, using methods from Paulissen et al. (2013). The initial SVL was subtracted from the subsequent capture then divided by the number of days between captures; for lizards with multiple recaptures a growth rate was calculated for each recapture. The same formula was used to calculate growth rate for weight. Body condition was calculated based on mass and body length using the following formula: $Mass^{0.33}$/ SVL (Andrews, 1991). Observing seasonal trends in the Chihuahuan Desert and to account for differences in how the environmental factors affect growth rates in the statistical analyses, the calendar year was categorized into the following seasons: “spring” (March – May); “summer” (June – August); “fall” (September – November); and “winter” (December – February).

Minitab was used to perform 2 sample t-tests for data that were normally distributed, and Mann-Whitney U tests for non-parametric data. R-statistical program was used to perform a varying intercept and varying slope model, where the intercept was allowed to change depending on the season; the slope for monthly averages, maximum wind speed, and total precipitation vary while the intercept varies based on the season snout-vent length and mass are independently affected by environmental factors so they were analyzed separately due to a low correlation of

0.41. The variables were standardized so that large differences in measurements were not exaggerated by the linear model and to become more statistically relevant. A fixed model was used to find the optimal predictors using results from the backward and forward elimination variable selection. An Akaike information criterion (AIC) in stepwise algorithm was applied to assess explanatory power of single terms given other variables were held at a constant. Following the variable selection procedures, the set of important explanatory variables identified were used as predictor variables in a linear mixed effects model with a random effect included to account for seasonal variation. The R-statistical analysis package (R Core Team, 2013) was used to perform a varying intercept and varying slope model linear mixed effect model using the *lme4* package (Bates et al., 2014). In this model, the intercept and slope are allowed to vary depending on the season. This is important to allow since aspects of lizard mass and SVL growth may change according to the season. AIC based fit tests are used to evaluate model fit for the linear mixed effect models.

RESULTS

A total of 626 individual *C. texanus* captures were recorded from Prospect Pits and Ranch House with the first found on August 28, 2010 and last on November 8, 2014 (Figure 7). A total of 291 adult females and 315 adult males (Figure 8) were recorded; an additional 20 unsexed juveniles were not included in the graph. There were a total of 180 independent recapture events during the study period. 80 of which were female (44%), 99 were males (55%), and one was an unsexed juvenile.

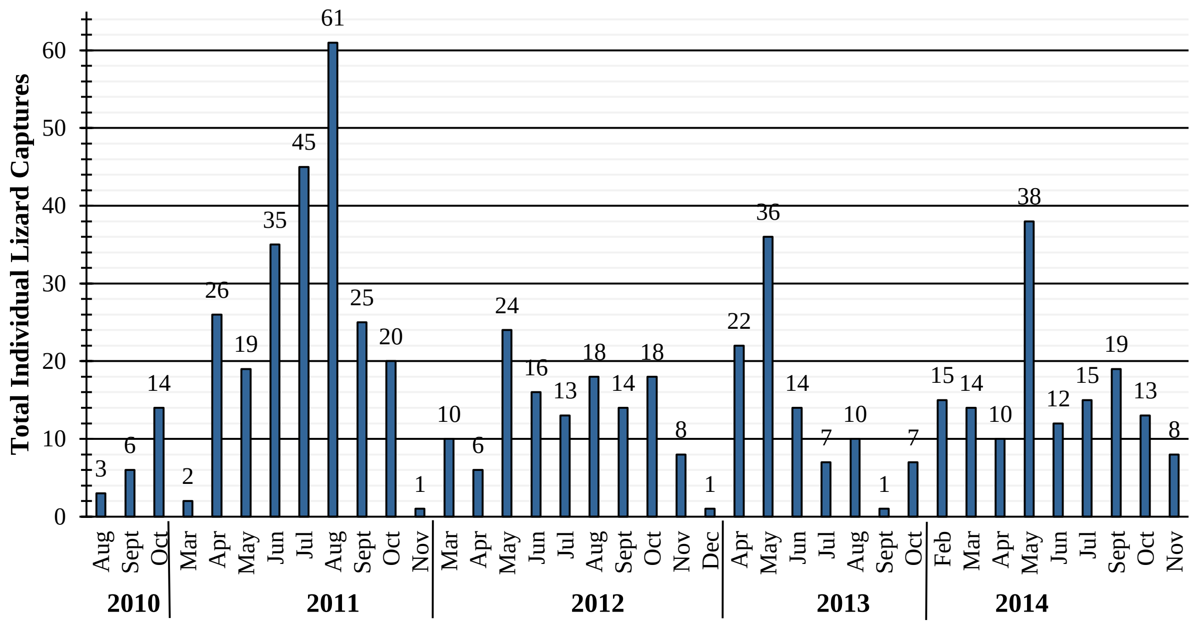

FIGURE 7. Total individual captures of *Cophosaurus texanus* on Indio Mountains Research Station from August 2010 to November 2014.

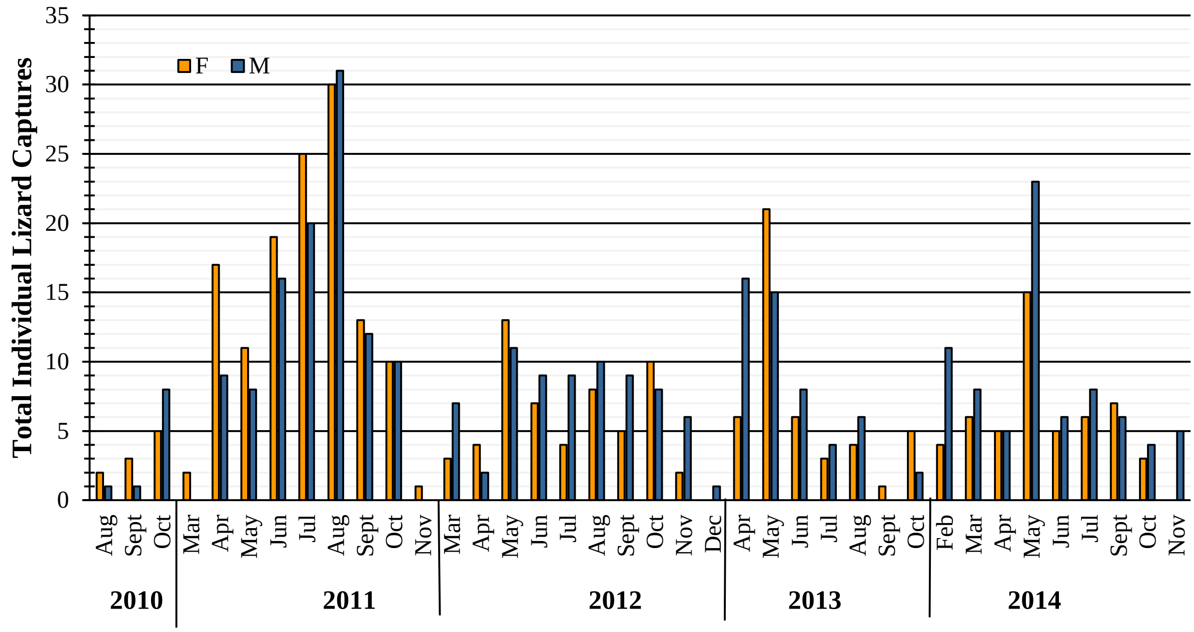

FIGURE 8. Number of males and females captured of *Cophosaurus texanus* on Indio Mountains Research Station from August 2010 to November 2014.

The largest male, captured in June 2014, had an 83 mm SVL, and weighed 17.5 g. Several juvenile males tied for smallest at 25 mm SVL that were captured in either October 2010 or September 2012; all weighed between 0.4 and 0.5 g. Figures 9 and 10 show the frequency of individual male SVL and mass, respectively, during the study period of 2010 through 2014; males had an average SVL of 58.27 ± 0.8 mm and an average mass of 7.12 g ± 0.25 g (range: 0.4 – 19.5 g). The largest females measured 64 mm SVL and were captured from April through August of various years, with their masses ranging from 7.7 to 8.6 g. The smallest female was 24 mm SVL and weighed 0.4 g in September 2012.

Figures 11 and 12 depict the frequencies of individual female SVL and mass, respectively, during the study period of 2010 through 2014; females averaged 51.45 ± 0.64 mm SVL and had an average mass of 4.8 g ± 0.15 g (range: 0.2 –12.3 g). The smallest lizard was captured in September 2014: an unsexed juvenile at 23 mm and a mass of 0.4 g.

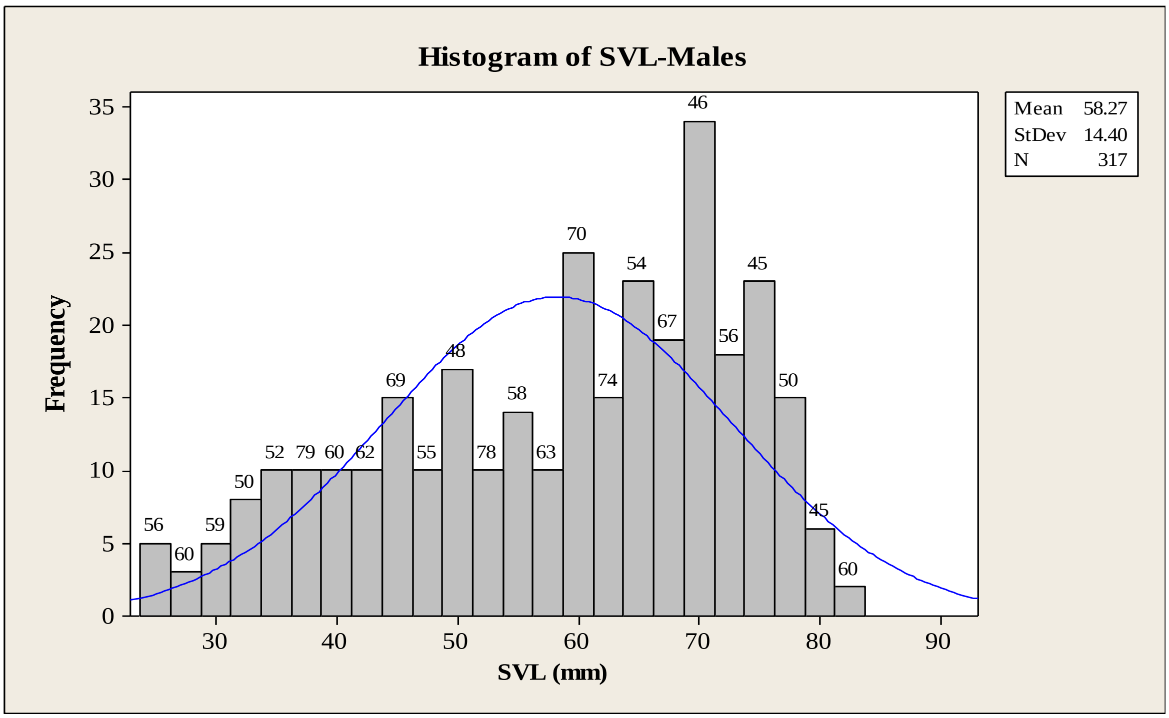

FIGURE 9. Snout-to-vent length distribution of male *Cophosaurus texanus* captured on Indio Mountains Research Station from 2010 through 2014.

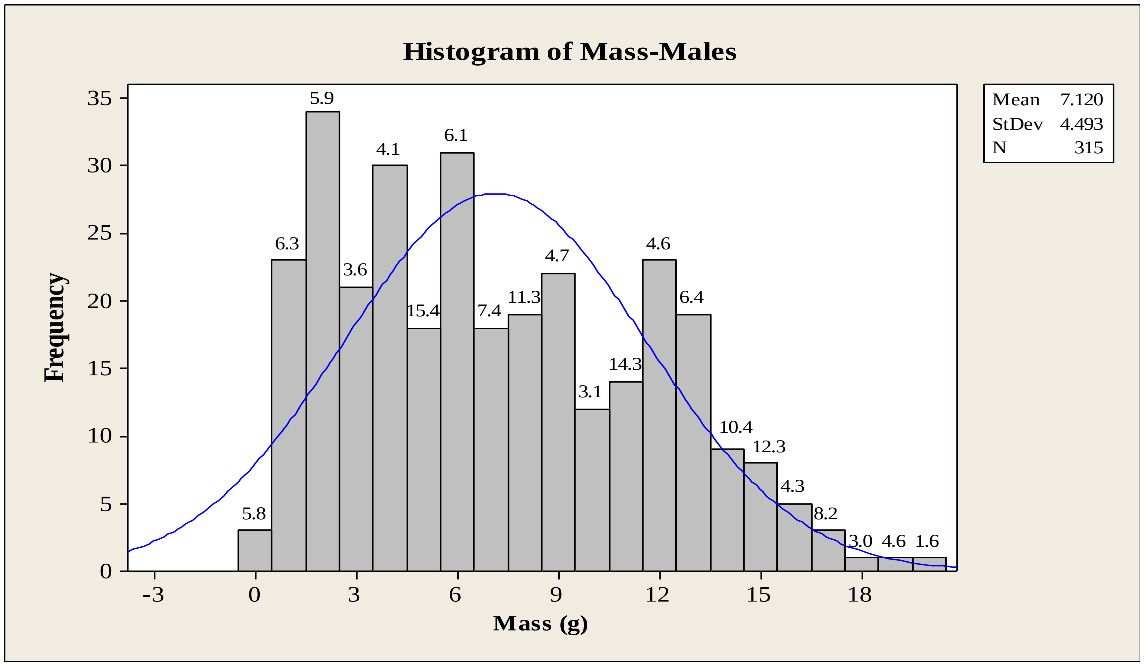

FIGURE 10. Mass distribution of male *Cophosaurus texanus* captured on Indio Mountains Research Station from 2010 through 2014.

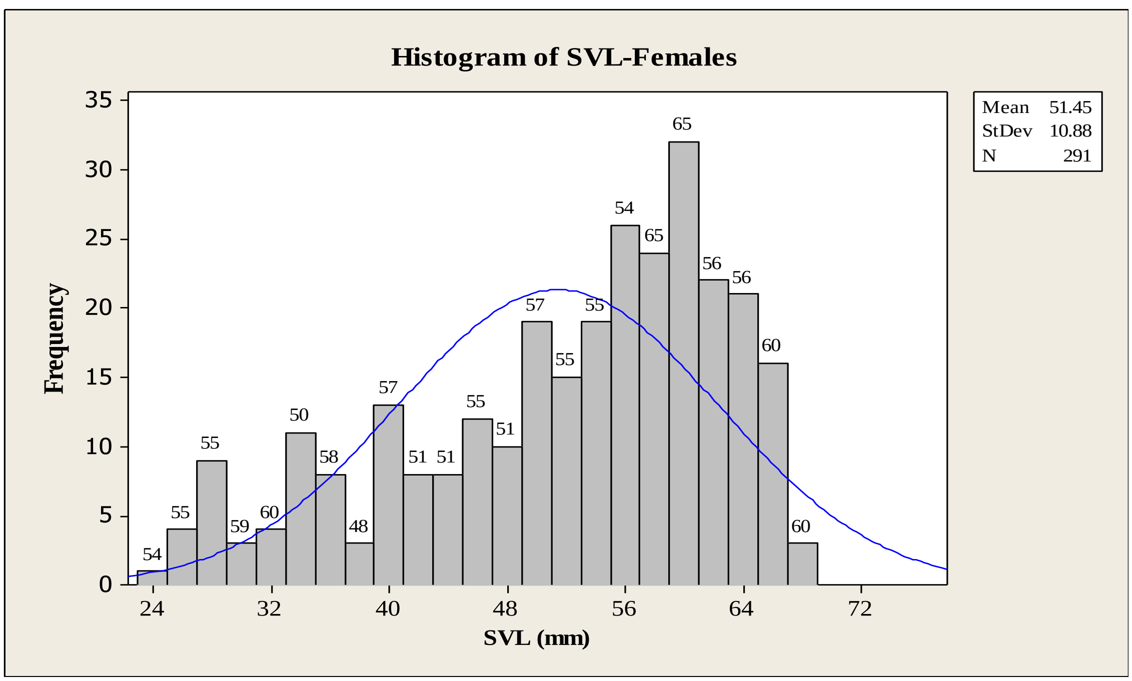

FIGURE 11. Snout-to-vent length distribution of female *Cophosaurus texanus* captured on Indio Mountains Research Station from 2010 through 2014.

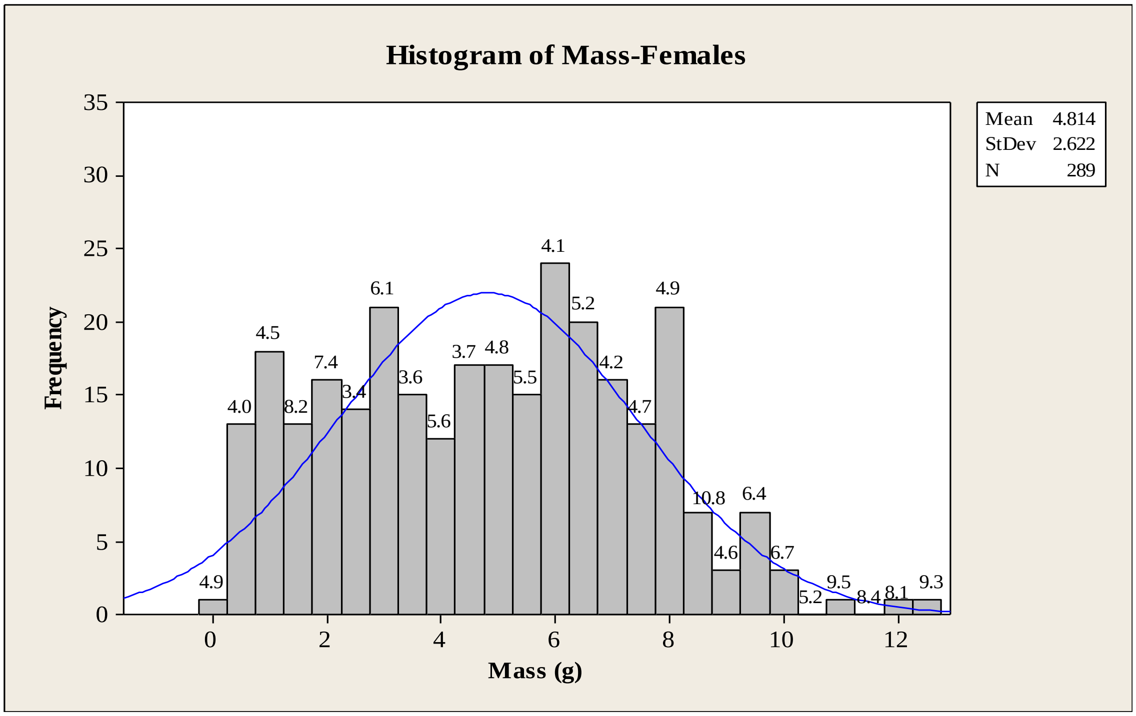

FIGURE 12. Mass distribution of female *Cophosaurus texanus* captured on Indio Mountains Research Station from 2010 through 2014.

There was a positive correlation between seasonal temperature and the growth rate for mass. The annual mean temperature for 2011 was 20.47°C with the maximum reached on June 26 at 34.95°C and a minimum of -12.94°C on February 3 (Figure 13), the annual sum of rainfall was 6.77 cm (Figure 14). In 2012 the maximum temperature was 33.15°C on June 27 and the minimum was 1.61°C on January 12, with an annual mean of 20.65°C (Figure 15) with an annual total rainfall of 14.62 cm (Figure 16). The maximum temperature for 2013 was 33.08°C on June 26 with a minimum of -2.24°C on November 24, while the annual mean was 19.26°C (Figure 17) and the annual rainfall sum was 19.31 cm (Figure 18). In 2014 the annual mean temperature was 19.65°C, with a maximum temperature of 33.85°C on June 2 and a minimum of -5.85°C on December 31 (Figure 19) with a total rainfall amount of 34.95 cm (Figure 20). Mean monthly temperature, wind speed, and sum of precipitation was calculated for days of capture (Table 1).

TABLE 1. Monthly precipitation, temperature and wind speed for days *C. texanus* were captured. N/A indicates that only one lizard was captured.

Month-Year	Sum of Precipitation (cm)	Standard Deviation	Mean Temperature (Celsius)	Standard Deviation	Mean Wind Speed (mph)	Standard Deviation
03-2012	0.000	0.000	17.161	0.1287	22.236	0.3118
04-2012	0.000	0.000	22.968	1.957	24.404	2.128
05-2012	0.000	0.000	24.821	0.115	26.736	2.516
06-2012	0.000	0.000	30.703	0.283	31.117	1.737
07-2012	0.000	0.000	27.321	0.122	29.387	0.981
08-2012	0.000	0.000	28.921	0.323	30.705	1.905
09-2012	0.025	0.006	24.628	1.565	28.012	2.247
10-2012	0.000	0.000	21.265	0.683	23.463	1.528
11-2012	0.000	0.000	16.843	0.000	20.546	0.000
12-2012	0.000	N/A	11.112	N/A	9.047	N/A
04-2013	0.000	0.000	20.423	1.115	19.965	3.030
05-2013	10.778	0.321	24.114	0.821	26.740	0.950
06-2013	3.456	0.221	29.214	0.512	29.203	0.932
07-2013	0.000	0.000	26.326	0.000	30.731	0.000
08-2013	2.436	0.392	28.421	0.450	26.612	1.032
09-2013	0.000	N/A	25.066	N/A	20.475	N/A
10-2013	0.000	0.000	20.448	0.000	17.745	2.175
02-2014	0.000	0.000	13.685	0.000	17.979	0.000
03-2014	0.454	0.824	15.621	0.000	18.882	2.751
04-2014	0.000	0.000	20.125	0.000	23.029	0.260
05-2014	0.000	0.000	24.597	0.000	25.173	0.371
06-2014	0.000	0.000	30.383	0.000	27.961	1.841
07-2014	0.000	0.000	28.301	0.241	28.756	1.567
09-2014	0.000	0.000	23.438	0.000	22.099	2.316
10-2014	0.000	0.000	21.791	0.000	21.548	1.977
11-2014	0.000	0.000	11.593	0.000	12.151	1.084

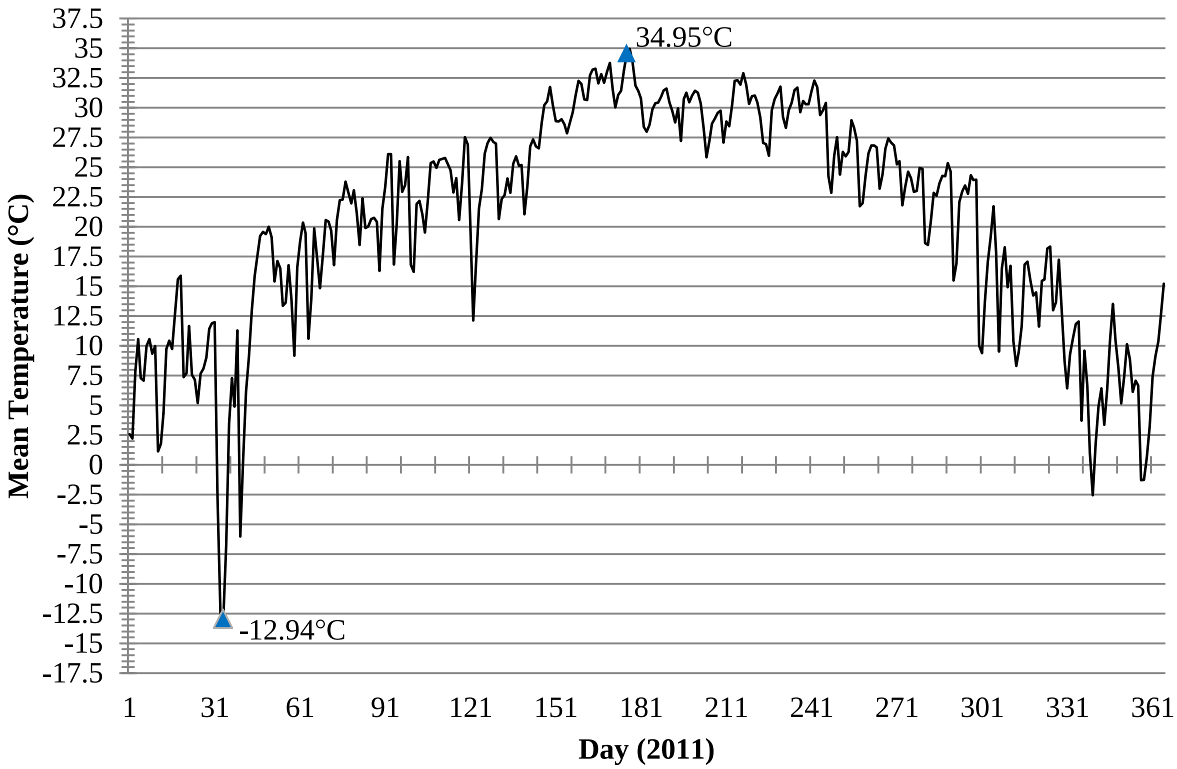

FIGURE 13. Mean daily temperature on Indio Mountains Research Station in 2011.

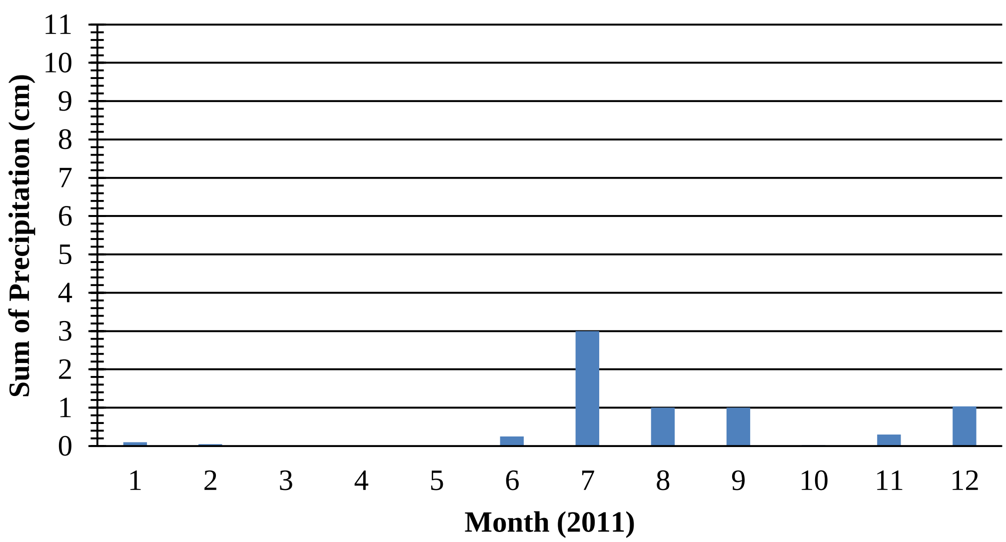

FIGURE 14. Sum of monthly precipitation on Indio Mountains Research Station in 2011.

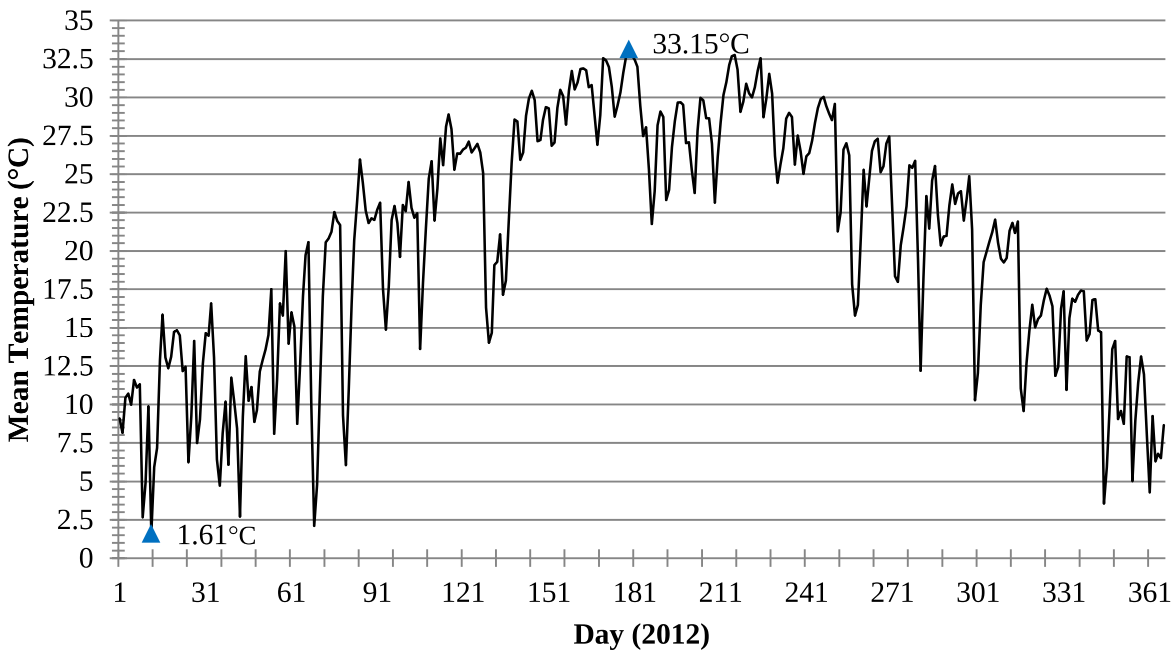

FIGURE 15. Mean daily temperature on Indio Mountains Research Station in 2012.

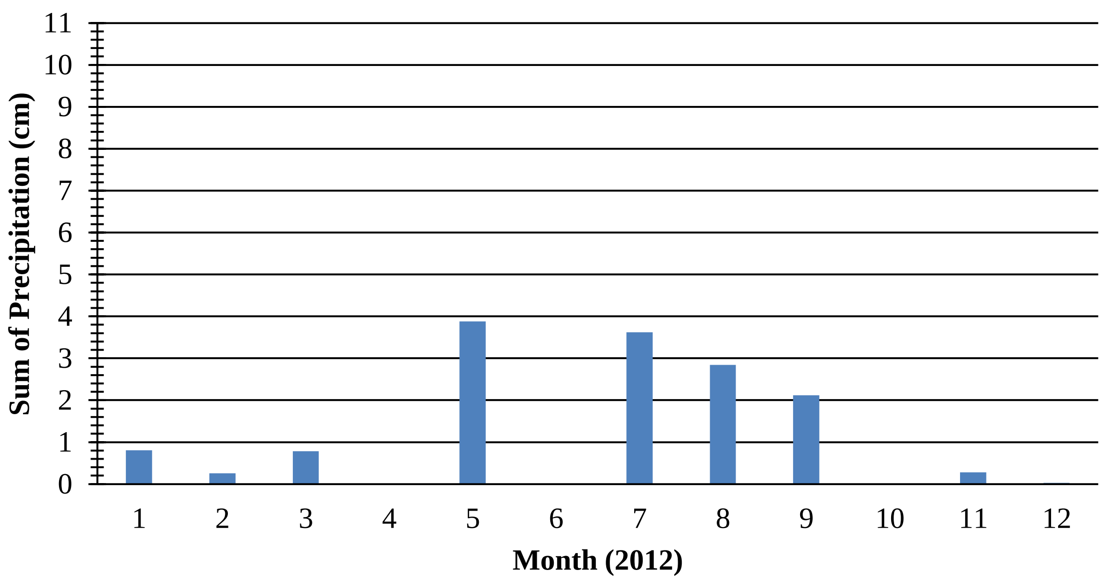

FIGURE 16. Sum of monthly precipitation on Indio Mountains Research Station in 2012.

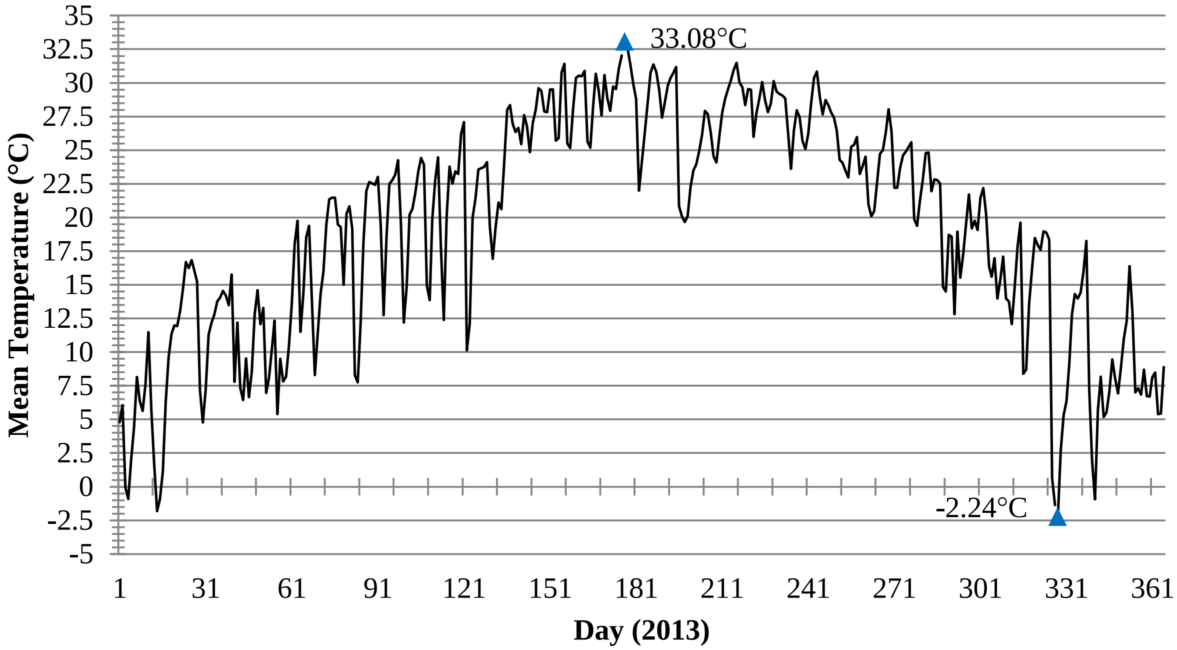

FIGURE 17. Mean daily temperature on Indio Mountains Research Station in 2013.

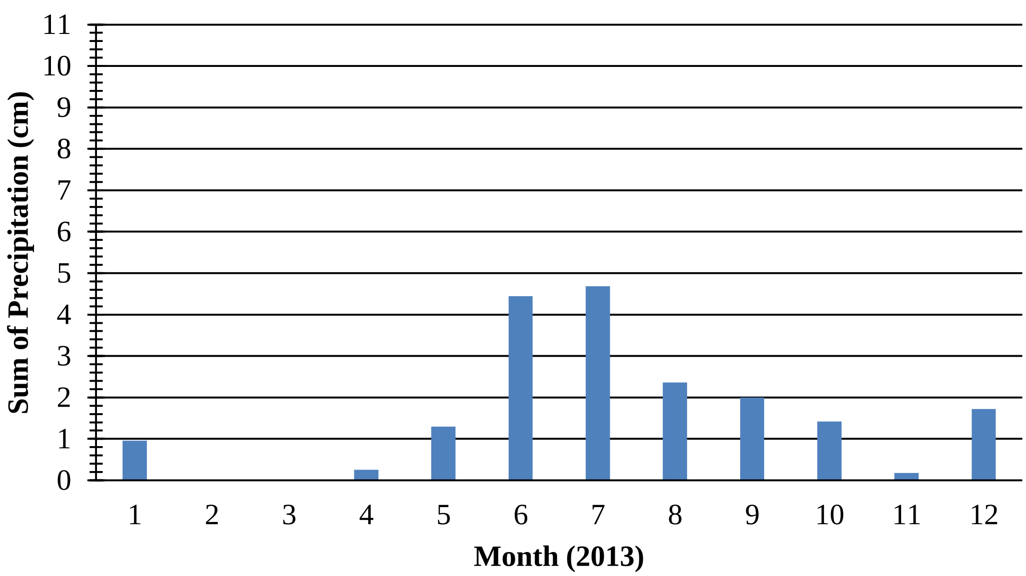

FIGURE 18. Sum of monthly precipitation on Indio Mountains Research Station in 2013.

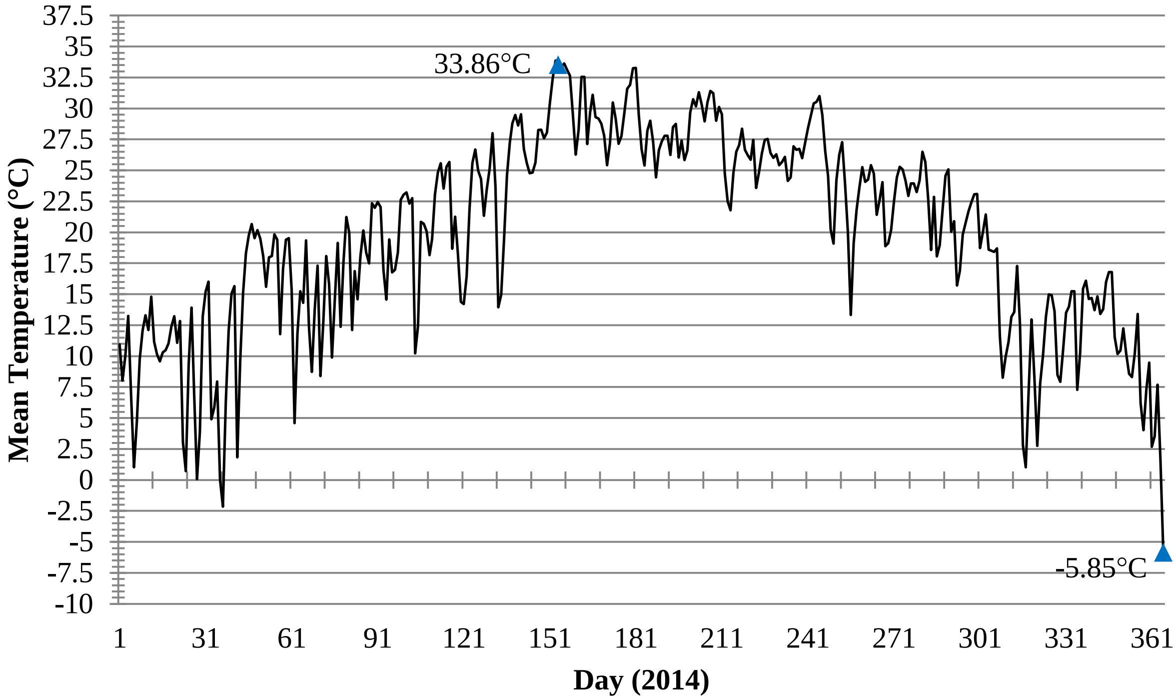

FIGURE 19. Mean daily temperature on Indio Mountains Research Station in 2014.

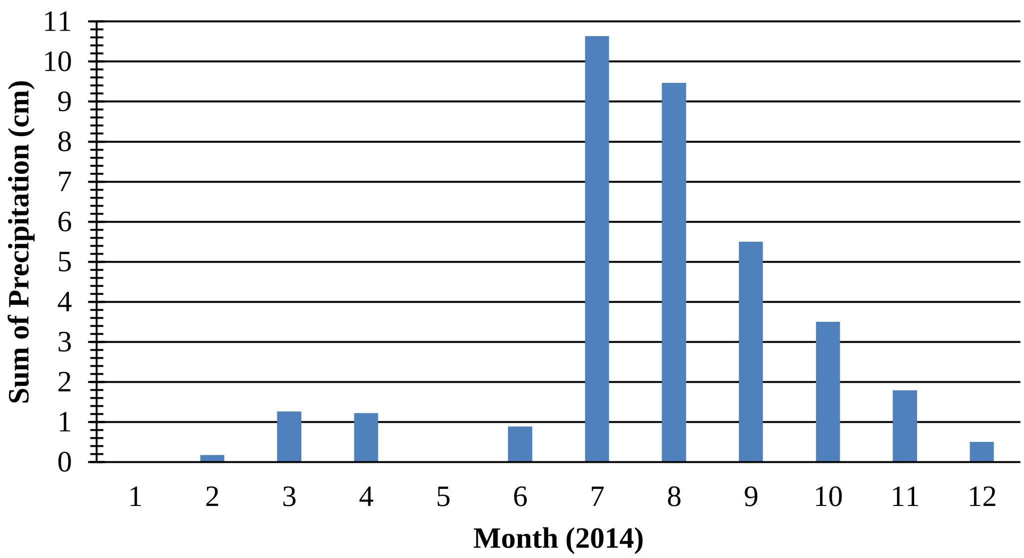

FIGURE 20. Sum of monthly precipitation on Indio Mountains Research Station in 2014.

A total of 71 recaptures were recorded in 2011 out of 234 total individual captures (Table 4). 55% of captures were females (n = 128), which totaled 45% of the recaptures (n = 32) (Figure 21). Of the 2011 total captures (234), 45% were males (n = 106), of which 39 (55%) were recaptures. Table 5 shows that in 2012 there were 128 individual captures with 46 recapture events (36%). Of the 56 (44%) captured females, 20 (43%) were recaptures. 72 (56%) captures were male and 26 males (57%) were recaptures (Figure 22).

In table 6, it can be seen there were 97 individuals captured in 2013, with 32 recaptures (33%). Females comprised 47% of captures (n = 46) and 48% of recaptures (n = 15). 53% of captures were male (n = 51) and 53% of recaptures were male (n = 17) (Figure 23). In 2014, 144 individuals were captured and 31 were recaptures (22%), represented in table 7. For females, there were 51 captures (35% of total), with 44% being recaptures (n = 14). 54% of all captures were male (n = 78) and 17 (55%) of those were recaptures (Figure 24).

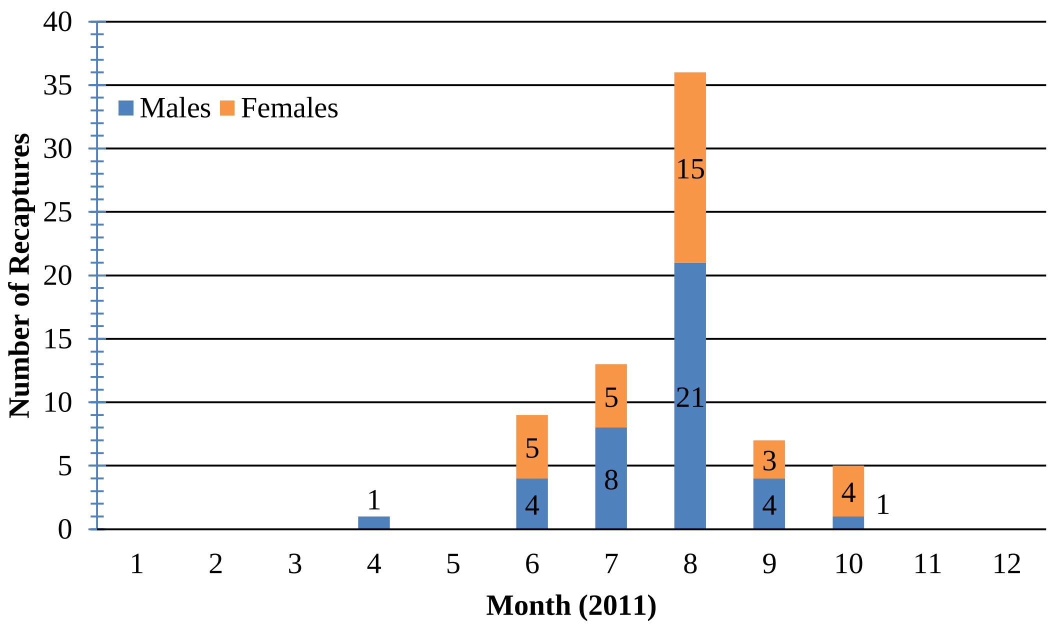

FIGURE 21. The monthly number of recapture events on IMRS for 2011.

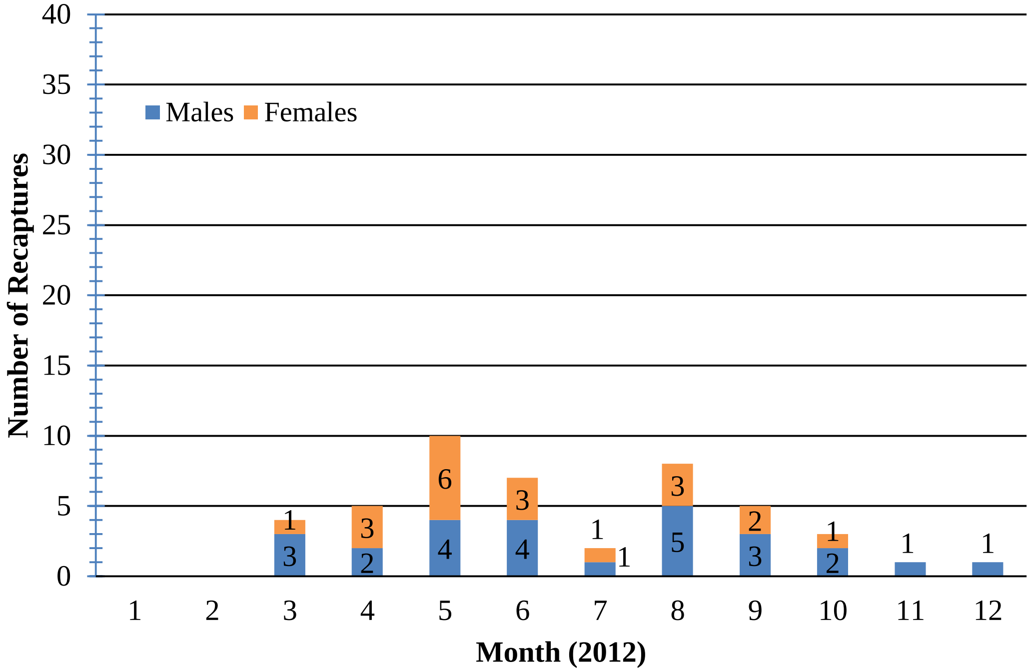

FIGURE 22. The monthly number of recapture events on IMRS for 2012.

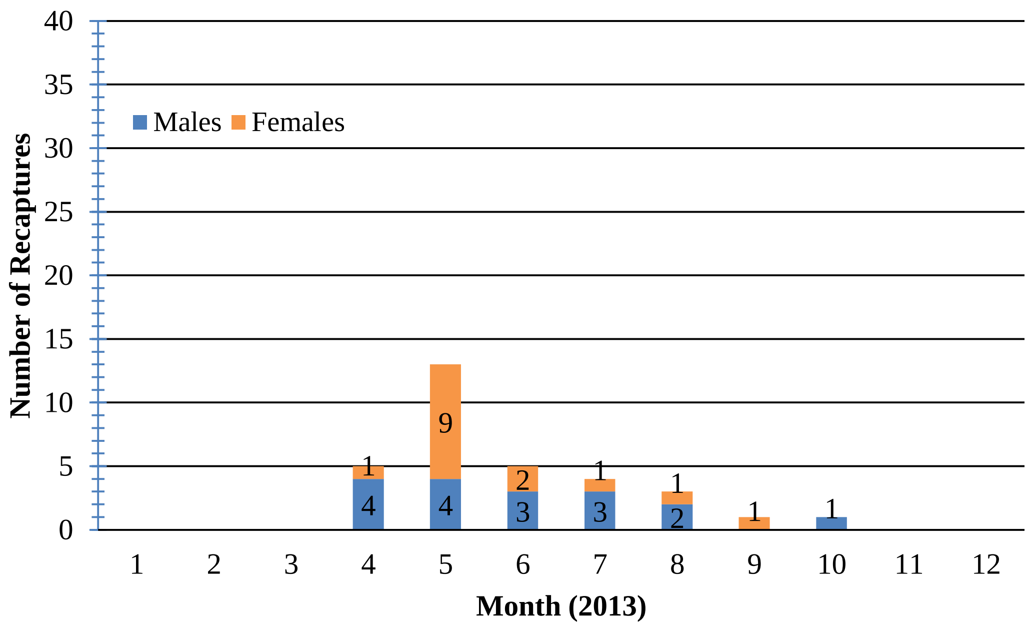

FIGURE 23. The monthly number of recapture events on IMRS for 2013.

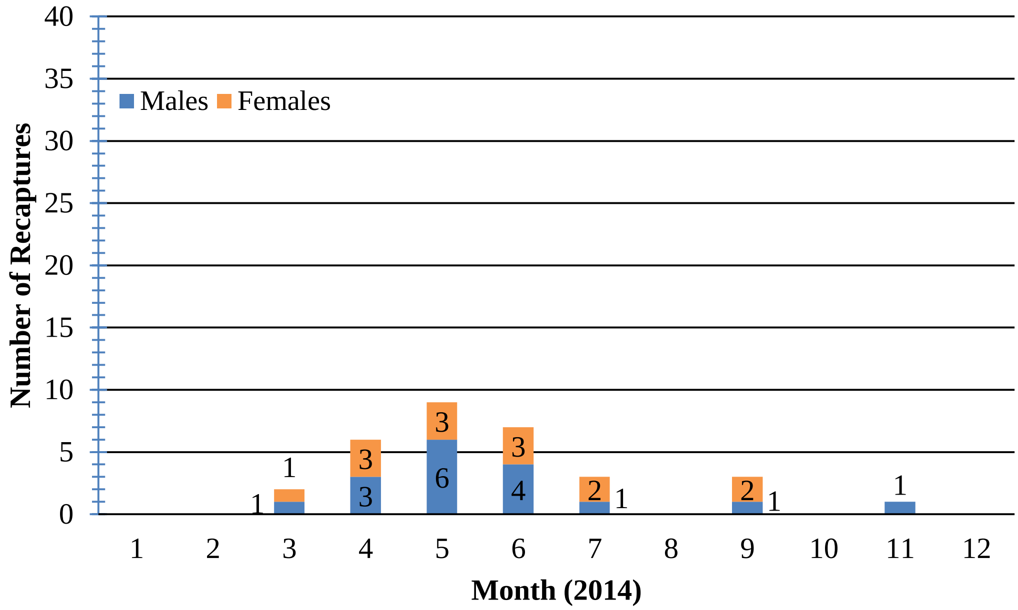

FIGURE 24. The monthly number of recapture events on IMRS for 2014.

Recapture rates were non-parametric therefore, Mann Whitney U tests were performed to detect significant differences between recaptures among years. Table 2 shows that the difference in female recaptures was not significant between any years and the results for male recaptures between years was similar with no significance. When observing combined recaptures among years significance, significance was also not indicated. Capture rates, however, were barely normally distributed so 2-sample t-tests were performed to analyze significant differences in captures among years. When analyzing sexes separately, no significant differences in captures between any years was found; there was also no significance among years for combined captures.

Table 2. The p-values for differences between recaptures among 2011-2014. No statistical significance observed between all years.

Female Recaptures	2012	2013	2014
2011	0.6701	0.4583	0.6586
2012	-	0.2484	0.4685
2013	-	-	0.6412
Male Recaptures	**2012**	**2013**	**2014**
2011	0.3430	0.7805	0.9268
2012	-	0.2358	0.1633
2013	-	-	0.9756
All Recaptures	**2012**	**2013**	**2014**
2011	0.4437	0.6431	1.000
2012	-	0.1567	0.2675
2013	-	-	0.6524

Table 3. The p-values for differences between all captures combined and by sexes among 2011-2014. No statistical significance observed between all years.

Female Captures	2012	2013	2014
2011	0.295	0.066	0.070
2012	-	0.381	0.82
2013	-	-	0.846
Male Captures	**2012**	**2013**	**2014**
2011	0.774	0.185	0.69
2012	-	0.249	0.681
2013	-	-	0.375
All Captures	**2012**	**2013**	**2014**
2011	0.493	0.105	0.270
2012	-	0.229	0.695
2013	-	-	0.387

TABLE 4. The total monthly numbers of individual captures, independent recapture events, and recapture percentages for each sex in 2011.

2011 Mo.	Total Individual Captures	Total Recapture Events	Total Recaptures (%)	Total Count Females	Females (%)	Total Females Recaptured	Female Recapture Rate (%)	Total Count Males	Males (%)	Total Males Recaptured	Male Recapture Rate (%)
1	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000
2	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000
3	2	0	0.0000	2	100.00	0	0.0000	0	0.0000	0	0.0000
4	26	1	0.0385	17	0.6538	0	0.0000	9	0.3462	1	100.00
5	19	0	0.0000	11	0.5789	0	0.0000	8	0.4211	0	0.0000
6	35	9	0.2571	19	0.5429	5	0.5556	16	0.4571	4	0.4444
7	45	13	0.2889	25	0.5556	5	0.3846	20	0.4444	8	0.6154
8	61	36	0.5902	30	0.4918	15	0.4167	31	0.5082	21	0.5833
9	25	7	0.2800	13	0.5200	3	0.4286	12	0.4800	4	0.5714
10	20	5	0.2500	10	0.5000	4	0.8000	10	0.5000	1	0.2000
11	1	0	0.0000	1	1.0000	0	0.0000	0	0.0000	0	0.0000
12	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000

TABLE 5. The total monthly numbers of individual captures, independent recapture events, and recapture percentages for each sex in 2012.

2012 Mo.	Total Individual Captures	Total Recapture Events	Total Recaptures (%)	Total Count Females	Females (%)	Total Females Recaptured	Female Recapture Rate (%)	Total Count Males	Males (%)	Total Males Recaptured	Male Recapture Rate (%)
1	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000
2	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000
3	10	4	0.4000	3	0.3000	1	0.2500	7	0.7000	3	0.7500
4	6	5	0.8333	4	0.6667	3	0.6000	2	0.3333	2	0.4000
5	24	10	0.4167	13	0.5417	6	0.6000	11	0.4583	4	0.4000
6	16	7	0.4375	7	0.4375	3	0.4286	9	0.5625	4	0.5714
7	13	2	0.1538	4	0.3077	1	0.5000	9	0.6923	1	0.5000
8	18	8	0.4444	8	0.4444	3	0.375	10	0.5555	5	0.5000
9	14	5	0.3571	5	0.3571	2	0.4000	9	0.6429	3	0.6000
10	18	3	0.1667	10	0.5556	1	0.3333	8	0.4444	2	0.6667
11	8	2	0.2500	2	0.2500	0	0.0000	6	0.7500	1	0.5000
12	1	1	100.00	0	0.0000	0	0.0000	1	100.00	1	100.00

TABLE 6. The total monthly numbers of individual captures, independent recapture events, and recapture percentages for each sex in 2013.

2013 Mo.	Total Individual Captures	Total Recapture Events	Total Recaptures (%)	Total Count Females	Females (%)	Total Females Recaptured	Female Recapture Rate (%)	Total Count Males	Males (%)	Total Males Recaptured	Male Recapture Rate (%)
1	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000
2	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000
3	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000
4	22	5	0.2273	6	0.2727	1	0.2000	16	0.7273	4	0.8000
5	36	13	0.3611	21	0.5833	9	0.6923	15	0.4167	4	0.3077
6	14	5	0.3571	6	0.4286	2	0.4000	8	0.5714	3	0.6000
7	7	4	0.5714	3	0.4286	1	0.2500	4	0.5714	3	0.7500
8	10	3	0.3000	4	0.4000	1	0.3333	6	0.6000	2	0.6667
9	1	0	0.0000	1	1.0000	1	100.0000	0	0.0000	0	0.0000
10	7	1	0.1429	5	0.7143	0	0.0000	2	0.2857	1	100.0000
11	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0

TABLE 7. The total monthly number of individual captures, independent recapture events, and recapture percentages for each sex in 2014.

2014 Mo.	Total Individual Captures	Total Recapture Events	Total Recaptures (%)	Total Count Females	Females (%)	Total Females Recaptured	Female Recapture Rate (%)	Total Count Males	Males (%)	Total Males Recaptured	Male Recapture Rate (%)
1	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000
2	15	0	0.0000	4	0.2667	0	0.0000	11	0.7333	0	0.0000
3	14	2	0.1429	6	0.4286	1	0.5000	8	0.5714	1	0.5000
4	10	6	0.6000	5	0.5000	3	0.5000	5	0.5000	3	0.5000
5	38	9	0.2368	15	0.3947	3	0.3333	23	0.6053	6	0.6667
6	12	7	0.5833	5	0.4167	3	0.4286	6	0.5000	4	0.5714
7	15	3	0.2000	6	0.4000	2	0.6667	8	0.5333	1	0.3333
8	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000
9	19	3	0.1579	7	0.3684	2	0.6667	6	0.3158	1	0.3333
10	13	1	0.0769	3	0.2308	0	0.0000	6	0.4615	0	0.0000
11	8	1	0.1250	0	0.0000	0	0.0000	5	0.6250	1	100.00
12	0	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0	0.0000

In table 8, monthly precipitation (p = 0.001364), monthly and daily maximum wind speed (p = 0.000304; p = 0.001605), and average monthly and daily temperature (p = 0.00; p = 0.00) were significantly correlated with SVL. Daily precipitation, however, was not significant for SVL. Monthly precipitation was also significant for increases in mass (p = 0.005252), as well as monthly and daily temperature (p = 2.96E-11; p = 1.96E-12). Other significant relationships include body condition and monthly maximum wind speed (p = 0.003087), as well as body condition and monthly average temperature (p = 0.00421). Monthly and daily precipitation was not significant for body condition. Monthly precipitation had significance with monthly (p = 1.33E-15) and daily average temperatures (p = 3.82E-13). Maximum monthly wind speed was also found to have significance with monthly and daily temperature (p = 5.92E-08; p = 2.67E-13), as well as daily precipitation (p = 1.99E-06). These relationships can be further visualized in Figure 25.

TABLE 8. Estimated correlation matrix with Hunter (1976) Worsley (1982) correction adjusted significance for multiplicity; consequently every p-value is compared to 0.005 (H-W adjusted significance level) in lower triangular region, with correlation coefficient values in upper triangular region. Significant p-values are in bold. SVL = snout-vent length; BC Index = body condition; Precip Mon = sum of monthly precipitation; Max WS Mon = monthly maximum wind speed; Mean Temp Mon = mean monthly temperature.

	SVL	**Mass**	**BC Index**	**GrowthRate SVL**	**GrowthRate Mass**	**Precip Mon**	**Max WS Mon**	**Mean Temp Mon**	**Precip Daily**	**Mean Temp Daily**	**Max WS Daily**
SVL	1.00	0.93	-0.15	-0.34	-0.06	0.17	0.19	0.45	0.05	0.048	0.16
Mass	**0.00**	1.00	0.11	-0.30	0.02	0.15	0.11	0.34	0.01	0.36	0.10
BC Index	**0.004518**	0.041688	1.00	-0.08	0.22	-0.01	-0.15	-0.15	-0.08	-0.14	-0.09
Growth Rate SVL	**0.000469**	**0.001882**	0.391384	1.00	0.41	-0.09	-0.04	-0.09	-0.07	-0.14	-0.05
Growth Rate Mass	0.575327	0.877353	0.02181	1.52E-05	1.00	-0.11	-0.05	-0.04	0.04	-0.04	0.01
Precip Mon	**0.001364**	**0.005232**	0.833177	0.338617	0.25511	1.00	0.02	0.40	0.02	0.37	-0.04
Max WS Mon	**0.000304**	0.045074	**0.003087**	0.714099	0.598096	0.762003	1.00	0.28	0.25	0.37	0.91
Mean Temp Mon	**0.00**	**2.96E-11**	**0.00421**	0.372575	0.683753	**1.33E-15**	**5.92E-08**	1.00	0.13	0.85	0.24
Precip Daily	0.325656	0.901738	0.091435	0.461423	0.67673	0.781051	**1.99E-06**	**0.01664**	1.00	0.13	0.35
Mean Temp Daily	**0.00**	**1.96E-12**	0.006916	0.159517	0.719746	**3.82E-13**	**2.67E-13**	**0.00**	**0.011584**	1.00	0.34
Max WS Daily	**0.001605**	0.046825	0.07653	0.647804	0.882851	0.493278	**0.00**	**7.29E-06**	**2.83E-12**	**1.93E-11**	1.00

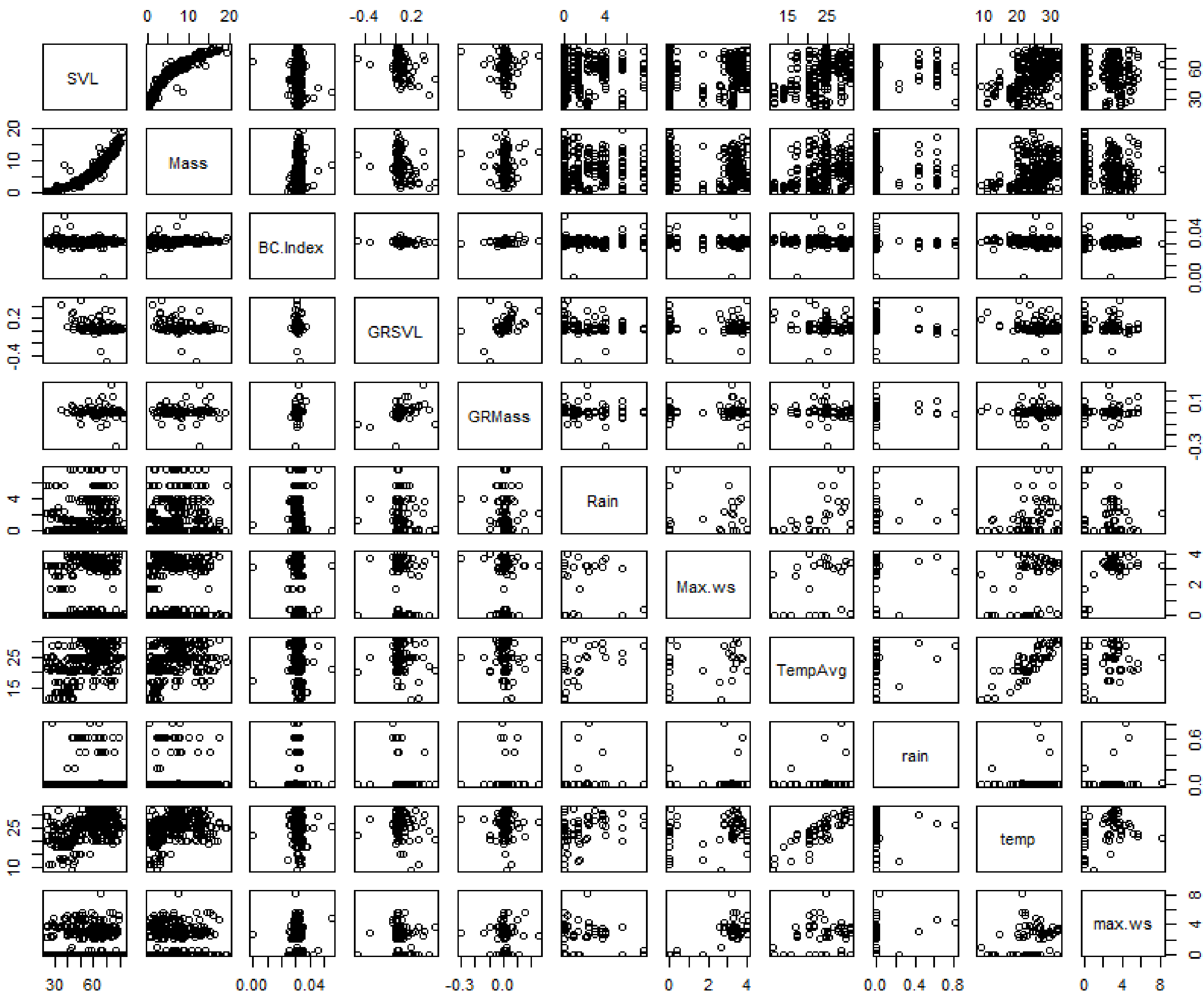

FIGURE 25. Scatterplot matrix for variables of interest for modelling. GR SVL = growth rate for snout-vent length; GR Mass = growth rate for mass.

In order to find the best form of a linear mixed effects model, a multivariable linear regression model was performed and backward elimination was utilized to identify a significant set of predictor variables. The backwards selection procedure identified a set of explanatory variables along with a set of two-way interaction terms between mass, SVL, body condition with

seasonal temperature. There was also a three way interaction between mass, body condition, and seasonal temperature. These sets of variables were then used in the linear mixed models with a random effect term included for season (coded fall, winter, spring, and summer). In the analysis, the slope varies for monthly averages, maximum wind speed, and total precipitation by season while the intercept just varies based on the season.

Based on a varying-intercept varying-slopes model (linear mixed model) there is a unique y-intercept and a unique slope for select variables for each season. In general, for any explanatory variable in the model, a one standard deviation increase in that variable changes the growth rate for mass or SVL by the value of the associated slope coefficient. For example, holding all other variables constant, a 1 standard deviation increase in the monthly rainfall on average increases the growth rate for mass in the spring by -0.04152, by 0.09877 in the summer, by 0.36329 in the fall, the most of all seasons, while in the winter by 0.20068.

For the model for the growth rate for mass, the variables monthly rainfall average, monthly maximum wind speed, an interaction term for Body Condition Index and daily average temperature, daily sum of rain and monthly maximum wind speed, an interaction term for mass and monthly sum of rain as well as SVL and monthly sum of rain, and last, a three-way interaction term for mass, SVL, and BCI. The variance components for the linear mixed model predicting growth rate for mass was 0.0989 for the intercept, 0.153 for monthly maximum wind speed, and 0.078 for monthly sum of rainfall. This reduces the random error in the linear model by approximately 45.4%.

Using the same varying-intercept varying-slopes model, a 1 standard deviation change in the monthly rainfall on average increases growth rate for SVL the most in the spring by -0.145714, in the summer by 0.000273, in the fall by 0.128397, and in winter by 0.007614. For

the model for the growth rate for SVL, the variables monthly rainfall average, monthly maximum wind speed, an interaction term for Body Condition Index and mass, monthly maximum wind speed, and daily maximum wind speed, an interaction term for mass and daily maximum wind speed, and daily sum of rainfall, as well as SVL and daily sum of rain, daily temperature average, daily maximum wind speed, and monthly maximum wind speed.

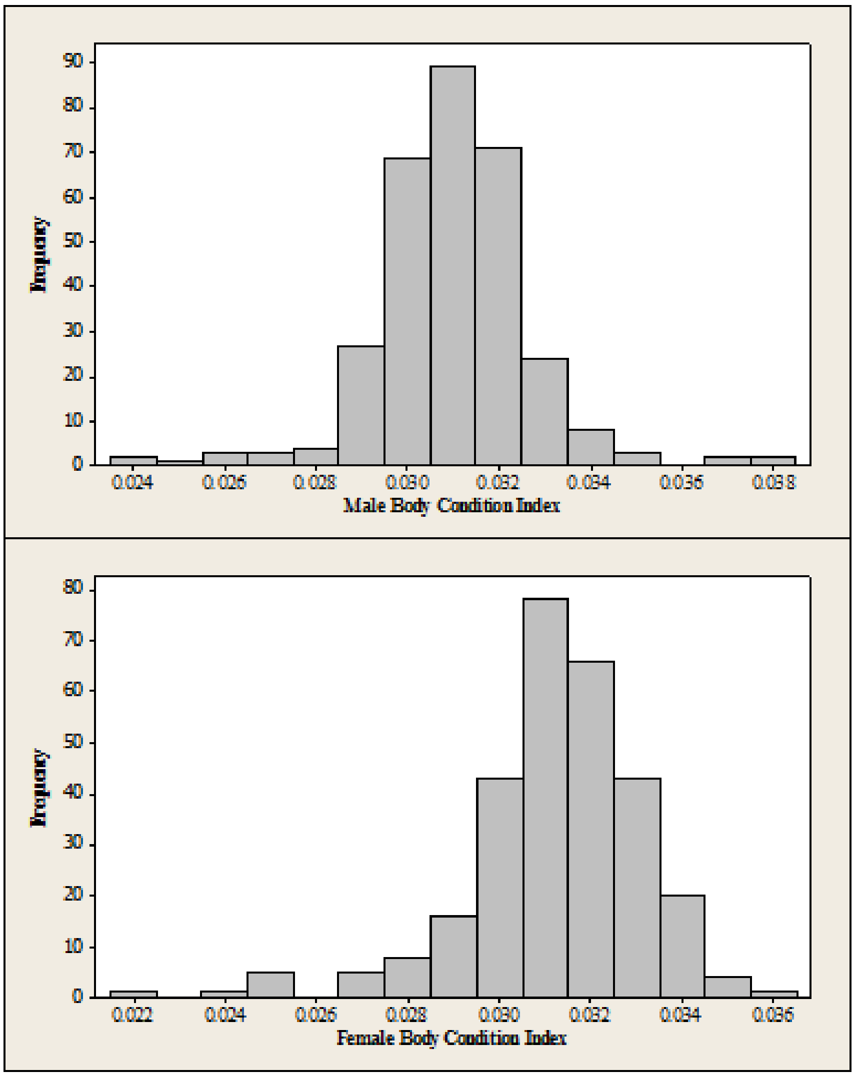

FIGURE 26. Distribution of body condition index of male (top) and female (bottom) *Cophosaurus texanus* captured on Indio Mountains Research Station from 2010 through 2014.

Combined body condition indices and growth rates for both SVL and mass were not normally distributed, so Mann-Whitney U tests were performed to compare this data. Females had higher body condition (p=0.0025), with a mean body condition index of 0.03229, than males who on average had an index of 0.031109 (Figure 26). Males had a higher growth rate for SVL than females (p = 0.0315), however, females had a positive mean mass growth rate of 0.00369 while males had a mean mass growth rate of -0.0145 (Table 9). Body condition indices did not have significance when comparing combined sexes between years, or for comparing summer to spring (p = 0.594) and fall to winter (p = 0.534). Body condition by season was normally distributed, and 2 sample t-tests between all other seasons were significantly different. A table of growth rates for SVL and mass for each recapture during the study period can be viewed in Appendix 1.

TABLE 9. Descriptive statistics for the growth rates and body conditions of males and females. Growth rates are mm/day. BCI=body condition index; GR=growth rate; N=sample size.

Variable	N	Mean	SE Mean	Minimum	Median	Maximum
BCI Males	292	0.03229	0.00101	0.02178	0.03131	0.32262
BCI Females	310	0.031109	0.000132	0.023816	0.030994	0.054977
GR SVL Females	79	0.0583	0.0156	-0.3333	0.0225	1.000
GR SVL Males	92	0.0762	0.0133	-0.5000	0.0445	0.5000
GR Mass Females	79	0.00369	0.00507	-0.2000	0.00588	0.11538
GR Mass Males	92	-0.0145	0.0584	-4.8000	0.0141	2.2333

In table 10, the total number of ectoparasitic mites for both sexes over the course of the study was 3,550. Over the four years, males had a total of 2,083 mites, while females had a total of 1,467 mites recorded on their bodies (Figure 27). The most infected bodily location was the

cervical in both sexes (total = 1,651; n = 953 males; n = 698 females). The second most infected location for parasites was the sacral region (total = 1,295; n = 813 males; n = 482 females). The mean number of mites in 2011 was 173.6 with a total of 1,736 recorded for both sexes combined. In 2012, 682 mites were recorded on both sexes with a mean of 68.2, while in 2013 the mean was 42.4 with a total of 424 mites recorded on both sexes. Finally, in 2014 a total of 708 mites were recorded on both sexes with a mean of 70.8. Mann-Whitney U tests were performed since the data was not normally distributed. The difference in total mites on both sexes was not significant for the following years: 2011 and 2012 (p = 0.1453), 2011 and 2014 (p=0.2905), 2012 and 2013 (p = 0.0776), 2012 and 2014 (p = 1.000), 2013 and 2014 (p = 0.0868). However, significance was present between years 2011 and 2013 (p = 0.0117). When analyzing total number of mites on females and males separately, no years were significant: 2011 (p = 0.5507), 2012 (p = 0.8976), 2013 (p = 0.6152), 2014 (p = 0.6853).

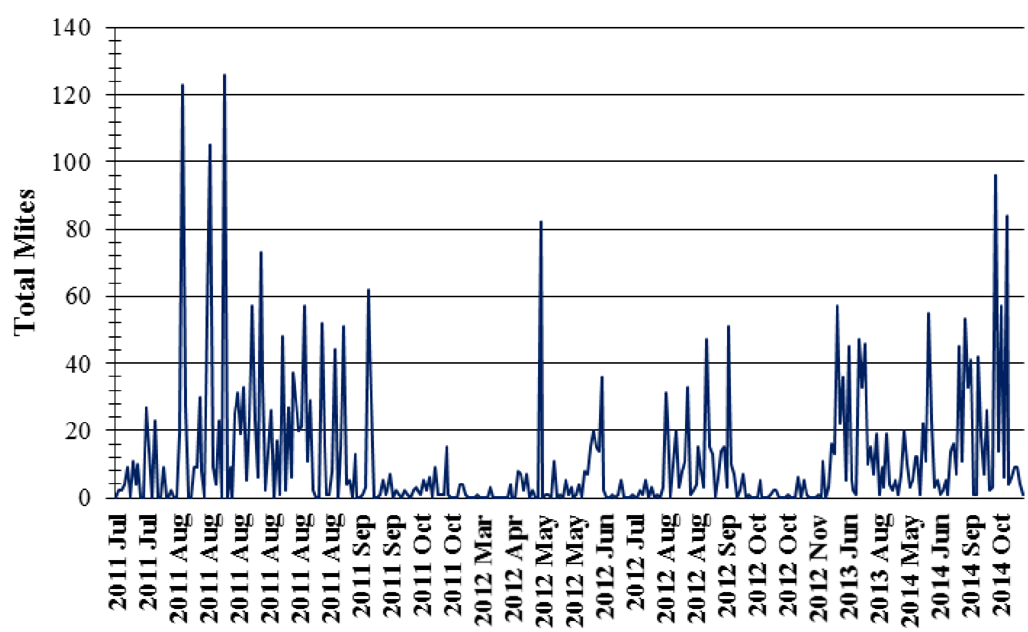

Figure 27. Total number of mites present on both sexes of all *Cophosaurus texanus* captured from 2011 to 2014.

TABLE 10. Total number of ectoparasites and their bodily location on *Cophosaurus texanus* captured 2011-2014. Abd=Abdominal; Aux=Auxillary; Cerv=Cervical; Ing=Inguinal; Sac=Sacral; Clo=Cloacal; Gul=Gular; Fem=Femoral; Tym=Tympanum.

All Lizards	Abd	Aux	Cerv	Pect	Ing	Sac	Clo	Gul	Fem	Tym	Total
2011	2	88	772	10	77	682	80	25	0	0	1,736
2012	0	38	349	2	2	230	50	8	3	0	682
2013	0	10	236	0	0	155	21	2	0	0	424
2014	1	82	294	0	63	228	27	13	0	0	708
Cumulative	3	218	1,651	12	142	1,295	178	48	3	0	3,550
Females	**Abd**	**Aux**	**Cerv**	**Pect**	**Ing**	**Sac**	**Clo**	**Gul**	**Fem**	**Tym**	**Total**
2011	0	39	334	5	15	235	57	13	0	0	698
2012	0	4	162	0	2	96	29	2	3	0	298
2013	0	8	94	0	0	59	13	0	0	0	174
2014	1	67	108	0	21	92	8	0	0	0	297
Total	1	118	698	5	38	482	107	15	3	0	1,467
Males	**Abd**	**Aux**	**Cerv**	**Pect**	**Ing**	**Sac**	**Clo**	**Gul**	**Fem**	**Tym**	**Total**
2011	2	49	438	5	62	447	23	12	0	0	1,038
2012	0	34	187	2	0	134	21	6	0	0	384
2013	0	2	142	0	0	96	8	2	0	0	250
2014	0	15	186	0	42	136	19	13	0	0	411
Total	2	100	953	7	104	813	71	33	0	0	2,083

Discussion

This was the first utilization of recorded environmental data for studying population ecology of the Greater Earless lizard on IMRS. Temperatures reached the highest and lowest of all years in 2011 with an extreme freeze event dropping temperatures to negative 12.94°C on February 3 and heating up to 34.95°C on June 26. Many small lizards may have been lost to predation or the cold weather during brumation over winter months, while those who survived had to slow metabolism pausing or reversing growth rates and body conditions until emergence the following season. The most *Cophosaurus texanus* were captured in 2011 (234; 106 males; 128 females). The mean and maximum temperatures for the three years were not over two degrees different, but minimum temperatures had 2012 and 2013 had average rainfall amounts (19.31; 34.95, respectively). The most precipitation occurred in 2014, which is also when the earliest captures in a calendar year occurred on February 22 (4 females and 10 males), and the latest capture recorded over the study period was December 15 of 2012. In 2013, only 97 individual captures were recorded, the least number of all years.

Fluctuations in seasonal temperature had a greater impact on the growth rate of lizards with larger snout-vent lengths, and larger bodied lizards were more highly impacted by increases in seasonal temperature, this could be because lizards with larger bodies retain heat for longer than smaller lizards “due to reduced surface-to-volume scaling” (Garrick, 2008). Garrick also mentions that digestion is known to induce a more rapid metabolic rate in many lizard species. There was significance between the interaction between baseline mass and average daily temperature suggesting increased prey abundance and metabolism stimulated by warmer temperatures allowed lizards to have more foraging opportunities. In turn, over cold periods where metabolism is lowered for extended periods of inactivity from mid-November to mid-

February when temperature are lowest, growth rates are also retarded until emergence and foraging occurs in spring.

Lizards with a smaller SVL can take more advantage of the warming sun and increase their body temperatures more rapidly than larger lizards. The growth rates of heavier lizards were affected more by changes in rainfall; increased wind speed is correlated with increased rainfall likely due to stormy weather events bringing increased wind. Changes in precipitation had the greatest effect on growth rate in the fall, and seasonal temperature had positive correlation with lizard mass probably due to delayed response of wider foraging windows in summer months indirectly affecting mass. Strong relationships with growth rate and the fall season are likely attributed to hatchlings, who have higher growth rates than adults, emerging in the fall.

Females seemed to have higher body conditions than males but this difference may be attributed to the increased gonadal tissue in reproductively mature females (Andrews, 1991; Punzo, 2000). A lizard who has recently consumed a meal would have a body condition higher than that of a lizard who has not eaten previous to being captured. Lizards seem to maintain rather stable body conditions throughout the year or succumb to predators and pathogens; short-term fluctuations in body condition would not be revealed in yearly analyses, therefore, body condition index had no significance between years. Although daily temperature affects lizards in short-term context such as immediate foraging responses, growth rate would not respond until after feeding has occurred. Males had higher growth rates than females, which may be related to increased success larger males have in defending territory and resources over smaller males (Clarke, 1965). Differences in growth rates between males and females was previously attributed primarily to sexual selection, however, it is suggested that size dimorphism “results from females

having a higher investment in reproductive activities" ultimately directing less energy toward growth (Punzo, 2000).

Although, higher infection numbers of mites were expected during wetter years the most mites were observed during 2011 (1,736) which had the lowest rainfall amount. This drought may have increased competition over decreased resources, or changed movement and behavior in response to environmental stress, likely weakening the immune system increasing susceptibility to parasitic infestation (Klukowski, 2004). An explanation for increased mite abundance on males could be that testosterone levels correlate with mite load (Cox and John-Alder, 2007). Males also move around more during breeding season than females and have larger body sizes with more surface area for mites to accumulate. Other studies have found that even if mites do have a negative effect on lizard fitness, it is minute relative to other ecological factors (Lukefahr, 2013; Schlaepfer, 2006), but this should be investigated further. This study, being focused on the relationship between lizard presence and environmental trends, only discusses the abundance of mites on bodily locations, however the impact of endoparasites and ectoparasites on the fitness of *Cophosaurus texanus* has not been performed on IMRS and should be considered for future research.

Cophosaurus texanus is sympatric with many other insectivores, including reptilian, avian, and mammalian species, therefore future studies should investigate resource partitioning and competition. Throughout their geographical range, this and other medium to small lizard species are crucial parts of the trophic system. On IMRS *C. texanus* has been noted to be consumed by rock rattle snakes (*Crotalus lepidus*; Mata-Silva et. al., 2011), and pallid bats (*Antrozous pallidus*; Lenhart et. al., 2010). Temporal analyses in relation to environmental patterns could be applied to explore ecological aspects of closely related threatened, vulnerable,

or endangered phrynosomatid lizards, such as species of the genus *Uma*, which are near vulnerable in Mexico because of human encroachment on their very specific habitat (IUCN Red List of Threatened Species, 2014), leading to more susceptibility to climate change. Understanding temporal trends and patterns of a lizard population becomes clearer when data accumulates over time; whereas a short term study may not reveal such patterns.

The instance of the female with the highest growth rate of 1 mm in a day (from August 11 to August 12, 2011) was probably due to human error in measurement. Events that may have reduced the probability of captures include instances of inclement weather, forcing researchers to close all traps immediately so that any lizards already in buckets would not be submerged in flowing rain water or experience a severe drop in body temperature; as well as specific traps not being opened due to flooding or lack of time allotted before the sun set. Due to technical difficulties wind speed could not be recorded beginning 08:15 on October 17, 2013 thus wind speed was not included in statistical analyses for 2013 and 2014. Lizards that had a negative growth rate may have been attributed to human error in measurement. In future mark-recapture studies utilizing multiple nearby sites, there should be a distinguishing mark to differentiate initial capture sites, as some larger species have broad home ranges and can easily migrate to a new area.

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APPENDIX 1. The growth rates for snout-vent length and mass for individual recapture events of *Cophosaurus texanus* on IMRS from 2010 to 2014.

ID #	Cap #	Date	SVL	Mass	Growth Rate SVL	Growth Rate Mass	Day Interval	Sex
GRF 1010	1	10-May-14	55	4				F
GRF 1010	2	24-May-14	55	4.5	0	0.035714286	14	F
GRF 1025	1	23-May-14	59	8.2				F
GRF 1025	2	21-Jun-14	60	7.4	0.034482759	-0.027586207	29	F
GRF 1039	1	23-May-14	60	6.1				M
GRF 1039	2	28-Jun-14	62	7.4	0.055555556	0.036111111	36	M
GRF 1067	1	26-May-14	51	4.8				F
GRF 1067	2	21-Jun-14	55	5.5	0.153846154	0.026923077	26	F
GRF 1120	1	12-Jul-14	60	6.6				M
GRF 1120	2	21-Sep-14	64	14.2	0.056338028	0.107042254	71	M
GRF 1174	1	21-Sep-14	61	8.4				F
GRF 1174	2	27-Sep-14	62	8.1	0.166666667	-0.05	6	F
GRF 1184	1	27-Sep-14	32	1.1				J
GRF 1184	2	04-Oct-14	35	1.3	0.428571429	0.028571429	7	J
GRF 1187	1	27-Sep-14	32	1.1				M
GRF 1187	2	07-Nov-14	44	3.2	0.292682927	0.051219512	41	M
GRF 905	1	24-Aug-13	63	7.9				M
GRF 905	2	10-Apr-14	70	12.3	0.030567686	0.019213974	229	M
GRF 907	1	21-Sep-13	28	0.8				F
GRF 916	1	18-Oct-13	43	2.8				F
GRF 916	2	22-Mar-14	45	3	0.012903226	0.001290323	155	F
GRF 943	1	22-Feb-14	41	2.2				F
GRF 943	2	10-Apr-14	46	2.9	0.106382979	0.014893617	47	F
GRF 946	1	22-Feb-14	42	2				M
GRF 946	2	23-May-14	64	6.9	0.244444444	0.054444444	90	M
GRF 963	1	22-Mar-14	41	1.9				M
GRF 963	2	10-May-14	50	3.8	0.183673469	0.03877551	49	M
GRF 964	1	22-Mar-14	37	1.4				M
GRF 964	2	21-Jun-14	53	4.3	0.175824176	0.031868132	91	M
GRF 986	1	10-Apr-14	41	2.2				F
GRF 986	2	10-May-14	46	3	0.166666667	0.026666667	30	F
WDL 012	1	28-Aug-10	65	9.4				F
WDL 012	2	04-Aug-12	62	7.9	-0.004243281	-0.002121641	707	F
WDL 045	1	25-Sep-10	32	0.5				F
WDL 045	2	16-Jul-11	55	5.2	0.078231293	0.015986395	294	F
WDL 066	1	14-Oct-10	48	3.7				M
WDL 066	2	07-Aug-11	64	7.6	0.053872054	0.013131313	297	M
WDL 091	1	02-Apr-11	71	13				M

WDL 091	2	07-Apr-11	71	12.3	0	-0.14	5	M
WDL 102	1	07-Apr-11	58	5.7				F
WDL 102	2	16-Jun-12	62	7.6	0.009174312	0.004357798	436	F
WDL 102	3	22-May-13	66	9.3	0.011764706	0.005	340	F
WDL 103	1	07-Apr-11	44	2.9				F
WDL 103	2	30-Jul-11	52	4.8	0.070175439	0.016666667	114	F
WDL 113	1	07-Apr-11	50	4				M
WDL 113	2	18-Jun-11	52	3.6	0.027777778	-0.005555556	72	M
WDL 115	1	07-Apr-11	37	1.7				F
WDL 115	2	11-Jun-11	54	4.7	0.261538462	0.046153846	65	F
WDL 115	3	25-Jun-11	54	4.9	0	0.014285714	14	F
WDL 115	4	16-Jul-11	58	6.7	0.19047619	0.085714286	21	F
WDL 115	5	29-Jul-11	60	6.5	0.153846154	-0.015384615	13	F
WDL 115	6	13-Aug-11	60	6.1	0	-0.026666667	15	F
WDL 115	7	10-Sep-11	61	6	0.035714286	-0.003571429	28	F
WDL 115	8	29-Mar-12	62	7.2	0.004975124	0.005970149	201	F
WDL 115	9	19-May-12	63	7.5	0.019607843	0.005882353	51	F
WDL 122	1	08-Apr-11	65	7.3				F
WDL 122	2	06-Aug-11	60	6.6	-0.041666667	-0.005833333	120	F
WDL 126	1	08-Apr-11	50	4				F
WDL 126	2	17-May-12	51	4.8	0.002469136	0.001975309	405	F
WDL 131	1	09-Apr-11	44	2.5				M
WDL 131	2	29-Jul-11	63	6.4	0.171171171	0.035135135	111	M
WDL 133	1	09-Apr-11	44	2.5				F
WDL 133	2	28-Apr-12	53	4.2	0.023376623	0.004415584	385	F
WDL 142	1	19-May-11	60	6.1				M
WDL 142	2	09-Aug-11	74	11.7	0.170731707	0.068292683	82	M
WDL 142	3	10-Sep-11	73	11.8	-0.03125	0.003125	32	M
WDL 142	4	18-Oct-13	75	14.8	0.00260078	0.00390117	769	M
WDL 143	1	19-May-11	73	9.8				M
WDL 143	2	09-Jul-11	72	10	-0.019607843	0.003921569	51	M
WDL 143	3	09-Aug-11	73	10.1	0.032258065	0.003225806	31	M
WDL 144	1	19-May-11	55	4.8				M
WDL 144	2	04-Jun-11	55	4.4	0	-0.025	16	M
WDL 158	1	19-May-11	46	3				M
WDL 158	2	25-Jun-11	51	3.9	0.135135135	0.024324324	37	M
WDL 158	3	26-Oct-11	72	13.1	0.170731707	0.074796748	123	M
WDL 165	1	21-May-11	48	3.4				F
WDL 165	2	11-Aug-11	56	5.6	0.097560976	0.026829268	82	F
WDL 165	3	12-Aug-11	57	5.4	1	-0.2	1	F
WDL 172	1	22-May-11	70	10.5				M
WDL 172	2	09-Jul-11	71	10.2	0.020833333	-0.00625	48	M
WDL 177	1	21-May-11	70	9.4				M

WDL 177	2	09-Aug-11	74	16.3	0.05	0.08625	80	M
WDL 177	3	10-Aug-11	74	11.5	0	-4.8	1	M
WDL 182	1	21-May-11	63	6				F
WDL 182	2	27-Aug-11	63	6	0	0	98	F
WDL 182	3	10-Sep-11	63	6.7	0	0.05	14	F
WDL 187	1	22-May-11	53	4.4				F
WDL 187	2	19-Jul-14	66	9.1	0.011265165	0.00407279	1154	F
WDL 207	1	04-Jun-11	59	5.6				M
WDL 207	2	06-Aug-11	67	9.2	0.126984127	0.057142857	63	M
WDL 207	3	09-Aug-11	68	15.9	0.333333333	2.233333333	3	M
WDL 207	5	31-Mar-12	73	12.9	0.021276596	-0.012765957	235	M
WDL 207	6	30-Jun-12	78	13.9	0.054945055	0.010989011	91	M
WDL 207	7	25-May-14	82	18.8	0.005763689	0.007060519	694	M
WDL 207	8	21-Jun-14	83	17.5	0.037037037	-0.048148148	27	M
WDL 208	1	04-Jun-11	38	6.1				F
WDL 208	2	17-May-12	50	4	0.034482759	-0.006034483	348	F
WDL 209	1	04-Jun-11	54	5.2				F
WDL 209	2	25-Jun-11	54	4.8	0	-0.019047619	21	F
WDL 210	1	04-Jun-11	50	3.4				F
WDL 210	2	11-Aug-11	60	7.5	0.147058824	0.060294118	68	F
WDL 219	1	11-Jun-11	57	4.9				M
WDL 219	2	25-Jun-11	57	4.5	0	-0.028571429	14	M
WDL 219	3	11-Aug-11	66	6.2	0.191489362	0.036170213	47	M
WDL 219	4	12-Aug-11	66	5.9	0	-0.3	1	M
WDL 219	5	10-Sep-11	69	10.5	0.103448276	0.15862069	29	M
WDL 219	6	14-Apr-12	72	12	0.013824885	0.006912442	217	M
WDL 224	1	11-Jun-11	54	4				F
WDL 224	2	18-Jun-11	55	4.4	0.142857143	0.057142857	7	F
WDL 224	3	13-Aug-11	60	7.1	0.089285714	0.048214286	56	F
WDL 234	1	17-Jun-11	49	3.4				F
WDL 234	2	25-Jun-11	49	3.2	0	-0.025	8	F
WDL 235	1	17-Jun-11	53	4.4				M
WDL 235	2	07-Aug-11	61	5.7	0.156862745	0.025490196	51	M
WDL 235	3	10-Apr-14	71	12.3	0.010235415	0.006755374	977	M
WDL 235	4	12-Apr-14	70	12.1	-0.5	-0.1	2	M
WDL 242	1	18-Jun-11	61	6.7				M
WDL 242	2	30-Jun-12	75	13.4	0.037037037	0.017724868	378	M
WDL 257	1	25-Jun-11	66	8.7				M
WDL 257	2	09-Jul-11	67	9.6	0.071428571	0.064285714	14	M
WDL 257	3	10-Sep-11	69	10.4	0.031746032	0.012698413	63	M
WDL 257	4	19-May-12	70	10.8	0.003968254	0.001587302	252	M
WDL 260	1	25-Jun-11	71	8.9				M
WDL 260	2	16-Jul-11	70	9.4	-0.047619048	0.023809524	21	M

WDL 260	3	20-Aug-11	72	10.2	0.057142857	0.022857143	35	M
WDL 270	1	09-Jul-11	54	4.6				M
WDL 270	2	06-Aug-11	60	6.1	0.214285714	0.053571429	28	M
WDL 270	3	13-Aug-11	62	6.3	0.285714286	0.028571429	7	M
WDL 270	4	04-Aug-12	75	11.5	0.036414566	0.014565826	357	M
WDL 271	1	09-Jul-11	62	6.4				M
WDL 271	2	12-Aug-11	65	7.3	0.088235294	0.026470588	34	M
WDL 272	1	09-Jul-11	75	9.7				M
WDL 272	2	29-Jul-11	78	12.3	0.15	0.13	20	M
WDL 272	3	07-Aug-11	75	10.5	-0.333333333	-0.2	9	M
WDL 272	4	13-Aug-11	77	10.9	0.333333333	0.066666667	6	M
WDL 272	5	18-May-12	77	12.8	0	0.006810036	279	M
WDL 272	6	19-May-12	77	12.5	0	-0.3	1	M
WDL 272	7	09-Jun-12	77	12.7	0	0.00952381	21	M
WDL 273	1	09-Jul-11	54	4.5				F
WDL 273	2	08-Aug-11	57	5.4	0.1	0.03	30	F
WDL 282	2	30-Jul-11	56	4.9				M
WDL 282	3	06-Aug-11	57	5	0.142857143	0.014285714	7	M
WDL 298	1	16-Jul-11	57	6				F
WDL 298	2	29-Jul-11	57	7.5	0	0.115384615	13	F
WDL 299	1	16-Jul-11	60	6				M
WDL 299	2	07-Aug-11	62	7.7	0.090909091	0.077272727	22	M
WDL 300	1	16-Jul-11	68	9.3				M
WDL 300	2	04-Aug-12	68	8.9	0	-0.001038961	385	M
WDL 315	1	23-Jul-11	61	7.1				F
WDL 315	2	11-Aug-11	63	7.2	0.105263158	0.005263158	19	F
WDL 315	3	20-Aug-11	62	6	-0.111111111	-0.133333333	9	F
WDL 315	4	15-Oct-11	63	8	0.017857143	0.035714286	56	F
WDL 316	1	23-Jul-11	55	5.7				F
WDL 316	2	07-Aug-11	56	4.9	0.066666667	-0.053333333	15	F
WDL 316	3	10-Sep-11	56	5.9	0	0.029411765	34	F
WDL 316	4	11-Aug-12	64	8.1	0.023809524	0.006547619	336	F
WDL 330	1	29-Jul-11	59	7.6				F
WDL 330	2	27-Aug-11	60	6.6	0.034482759	-0.034482759	29	F
WDL 331	1	29-Jul-11	56	5.7				F
WDL 331	2	14-Apr-12	58	6.5	0.007692308	0.003076923	260	F
WDL 344	1	30-Jul-11	53	6.1				F
WDL 344	2	07-Aug-11	56	6.9	0.375	0.1	8	F
WDL 363	1	06-Aug-11	71	11.6				M
WDL 363	2	23-May-14	80	15.5	0.008814887	0.003819785	1021	M
WDL 366	1	07-Aug-11	60	5.8				M
WDL 366	2	09-Jun-12	74	12.7	0.045602606	0.02247557	307	M
WDL 368	1	08-Aug-11	52	4.2				F

WDL 368	2	20-Aug-11	53	4.5	0.083333333	0.025	12	F
WDL 371	1	09-Aug-11	59	9.4				F
WDL 371	2	15-Oct-11	59	8.2	0	-0.017910448	67	F
WDL 383	1	09-Aug-11	56	5.1				M
WDL 383	2	22-May-13	72	12.4	0.024539877	0.011196319	652	M
WDL 393	1	11-Aug-11	64	8.6				F
WDL 393	2	13-Oct-11	63	10.2	-0.015873016	0.025396825	63	F
WDL 393	3	16-May-12	66	8.5	0.013888889	-0.00787037	216	F
WDL 393	4	19-May-12	65	8.1	-0.333333333	-0.133333333	3	F
WDL 393	5	07-Sep-12	65	8.1	0	0	111	F
WDL 393	6	23-May-13	68	9.9	0.011627907	0.006976744	258	F
WDL 393	7	13-Jul-13	68	7.9	0	-0.039215686	51	F
WDL 407	1	11-Aug-11	61	5.8				M
WDL 407	2	13-Aug-11	61	5.6	0	-0.1	2	M
WDL 408	1	11-Aug-11	58	7				F
WDL 408	2	12-Aug-11	58	6.9	0	-0.1	1	F
WDL 448	1	17-Sep-11	69	11.4				M
WDL 448	2	30-Mar-12	72	13.3	0.015384615	0.00974359	195	M
WDL 460	1	24-Sep-11	32	0.9				M
WDL 460	2	28-Apr-12	52	3.8	0.092165899	0.013364055	217	M
WDL 461	1	24-Sep-11	28	0.7				F
WDL 461	2	15-Oct-11	34	1.2	0.285714286	0.023809524	21	F
WDL 464	1	24-Sep-11	63	8.4				F
WDL 464	2	28-Apr-12	62	8.3	-0.004608295	-0.000460829	217	F
WDL 496	1	06-Nov-11	39	2.1				F
WDL 496	2	07-Sep-12	59	7.8	0.065359477	0.018627451	306	F
WDL 512	1	30-Mar-12	60	6.9				M
WDL 512	2	18-May-12	67	8.2	0.142857143	0.026530612	49	M
WDL 525	1	14-Apr-12	51	3.6				F
WDL 525	2	19-May-12	58	5.7	0.2	0.06	35	F
WDL 525	3	09-Jun-12	60	6.3	0.095238095	0.028571429	21	F
WDL 540	1	16-May-12	51	4.4				F
WDL 540	2	04-Aug-12	59	5.8	0.1	0.0175	80	F
WDL 552	1	17-May-12	55	5.3				F
WDL 552	2	30-Jun-12	57	6.3	0.045454545	0.022727273	44	F
WDL 580	1	19-May-12	56	4.7				F
WDL 580	2	14-Jul-12	59	5.9	0.053571429	0.021428571	56	F
WDL 580	3	23-May-13	65	7.8	0.019169329	0.006070288	313	F
WDL 580	4	22-Jun-13	66	8.2	0.033333333	0.013333333	30	F
WDL 580	5	10-Aug-13	64	7.7	-0.040816327	-0.010204082	49	F
WDL 580	6	26-May-14	66	8.9	0.006920415	0.004152249	289	F
WDL 615	1	29-Jun-12	71	10.6				M
WDL 615	2	10-Oct-12	75	14.5	0.038834951	0.037864078	103	M

WDL 616	1	30-Jun-12	58	7				F
WDL 616	2	10-Apr-14	64	7.7	0.009244992	0.001078582	649	F
WDL 619	1	30-Jun-12	63	7.1				M
WDL 619	2	14-Jul-12	63	6.7	0	-0.028571429	14	M
WDL 619	3	07-Sep-12	65	7.7	0.036363636	0.018181818	55	M
WDL 633	1	14-Jul-12	70	11				M
WDL 633	2	22-Jun-13	76	15.1	0.017492711	0.011953353	343	M
WDL 633	3	24-Aug-13	77	13	0.015873016	-0.033333333	63	M
WDL 634	1	14-Jul-12	66	8.5				M
WDL 634	2	13-Jul-13	76	12.9	0.027472527	0.012087912	364	M
WDL 637	1	14-Jul-12	56	5				F
WDL 637	2	11-Oct-12	58	5.9	0.02247191	0.01011236	89	F
WDL 637	3	23-May-13	61	6.6	0.013392857	0.003125	224	F
WDL 637	4	11-Apr-14	60	6.9	-0.003095975	0.000928793	323	F
WDL 638	1	14-Jul-12	66	8.1				M
WDL 638	2	04-Aug-12	68	8.3	0.095238095	0.00952381	21	M
WDL 638	3	12-Apr-13	71	11.8	0.011952191	0.013944223	251	M
WDL 640	1	14-Jul-12	69	9.4				M
WDL 640	2	09-Aug-13	78	14.2	0.023017903	0.012276215	391	M
WDL 642	1	14-Jul-12	57	6.1				F
WDL 642	2	22-May-13	61	7.1	0.012820513	0.003205128	312	F
WDL 642	3	21-Jun-14	64	7.8	0.007594937	0.001772152	395	F
WDL 643	1	14-Jul-12	59	6.1				M
WDL 643	2	04-Aug-12	64	6.1	0.238095238	0	21	M
WDL 672	1	07-Sep-12	73	11.7				M
WDL 672	2	23-May-13	61	7.3	-0.046511628	-0.017054264	258	F
WDL 673	1	07-Sep-12	68	8.9				M
WDL 673	2	22-Sep-12	73	12.7	0.333333333	0.253333333	15	M
WDL 673	3	10-Oct-12	75	15.4	0.111111111	0.15	18	M
WDL 673	4	27-Apr-13	79	16.1	0.020100503	0.003517588	199	M
WDL 676	1	11-Aug-12	33	1.3				M
WDL 676	2	04-Jun-13	67	10.8	0.114478114	0.031986532	297	M
WDL 682	1	08-Sep-12	65	7.5				M
WDL 682	2	22-Sep-12	67	9.5	0.142857143	0.142857143	14	M
WDL 694	1	22-Sep-12	27	0.8				M
WDL 694	2	15-Dec-12	43	2.3	0.19047619	0.017857143	84	M
WDL 694	3	24-May-13	58	6.4	0.09375	0.025625	160	M
WDL 694	4	23-May-14	79	15.2	0.057692308	0.024175824	364	M
WDL 700	1	11-Oct-12	35	1.4				F
WDL 700	2	11-Apr-13	50	3.9	0.082417582	0.013736264	182	F
WDL 709	1	12-Oct-12	54	5.5				M
WDL 709	2	10-May-14	79	16.6	0.043478261	0.019304348	575	M
WDL 711	1	12-Oct-12	37	8.6				M

WDL 711	2	13-Jul-13	64	7.2	0.098540146	-0.005109489	274	M
WDL 711	3	19-Jul-14	77	14	0.035040431	0.018328841	371	M
WDL 717	1	13-Oct-12	37	1.5				M
WDL 717	2	03-Nov-12	43	3	0.285714286	0.071428571	21	M
WDL 721	1	13-Oct-12	28	0.7				F
WDL 721	2	22-May-13	40	1.6	0.054298643	0.004072398	221	F
WDL 724	1	13-Oct-12	47	3.3				M
WDL 724	2	11-Apr-13	57	5.5	0.055555556	0.012222222	180	M
WDL 724	3	22-May-13	60	5.1	0.073170732	-0.009756098	41	M
WDL 731	1	03-Nov-12	31	1.1				F
WDL 731	2	23-May-13	44	2.4	0.064676617	0.006467662	201	F
WDL 739	1	11-Apr-13	49	3.7				M
WDL 739	2	13-Apr-13	50	3.5	0.5	-0.1	2	M
WDL 748	1	12-Apr-13	46	3.6				M
WDL 748	2	22-Mar-14	73	13.8	0.078488372	0.029651163	344	M
WDL 773	1	27-Apr-13	61	6.3				M
WDL 773	2	13-Jul-13	71	10.3	0.12987013	0.051948052	77	M
WDL 776	1	27-Apr-13	49	3.8				M
WDL 776	2	22-Jun-13	69	8.3	0.357142857	0.080357143	56	M
WDL 777	1	27-Apr-13	47	3.1				F
WDL 777	2	27-Sep-14	65	9.6	0.034749035	0.012548263	518	F
WDL 789	1	22-May-13	47	2.7				M
WDL 789	2	21-Jun-14	50	3.8	0.007594937	0.00278481	395	M
WDL 791	1	22-May-13	56	4.4				M
WDL 791	2	23-May-13	56	4.5	0	0.1	1	M
WDL 817	1	24-May-13	48	3.1				F
WDL 817	2	15-Jun-13	49	2.3	0.045454545	-0.036363636	22	F
WDL 851	1	22-Jun-13	54	5.5				F
WDL 851	2	19-Jul-14	65	12.3	0.028061224	0.017346939	392	F

APPENDIX 2: Records of all captures and recaptures of *Cophosaurus texanus* using pitfall traps/noosing methods on Indio Mountains Research Station from August 2010 to November 2014. Cap # = capture number; SVL = snout-vent length; TL = tail length.

ID#	Cap#	Location	Transect	Trap	GPS	Date	Time	Sex	Gravid	SVL(mm)	TL(mm)	Mass(g)	Toe Clip (1)	Toe Clip (2)
WDL 011	1	RH	2	5		28-Aug-10	17:00	M	No	63	60	8.7	18	
WDL 012	1	RH	4	1		28-Aug-10	19:15	F	No	65	79	9.4	20	5
WDL 013	1	PP				28-Aug-10	21:00	F	No	62	66	5.2		
WDL 020	1	PP	1	4		11-Sep-10	8:00	J	No	30	36	0.7	1	6
WDL 037	1	RH	6	5		11-Sep-10	18:00	J	No	35	43	0.9	1	7
WDL 038	1	PP	1	1		11-Sep-10	17:00	F	No	27	18	0.2	1	8
WDL 045	1	RH	7	1		25-Sep-10	18:00	F	No	32	37	0.5	1	11
WDL 046	1	RH	5	2		25-Sep-10	19:00	F	No	49	50	1.6	1	13
WDL 047	1	RH	5	2		25-Sep-10	19:00	M	No	33	42	0.8	1	14
WDL 050	1	PP	5	3		2-Oct-10	8:00	F	No	62	71	8.2	1	15
WDL 054	1	RH	1	3		2-Oct-10	17:00	F	No	61	52	8	1	17
WDL 055	1	RH	3	2		2-Oct-10	17:00	M	No	43	35	2.6	1	18
WDL 056	1	RH	6	3		2-Oct-10	17:00	M	No	58	12	6.3	1	20
WDL 057	1	RH	6	3		2-Oct-10	17:00	M	No	25	29	0.4	3	5
WDL 064	1	PP	4	6		14-Oct-	8:00	F	No	31	37	0.8	3	10

						10								
WDL 065	1	PP	5	5		14-Oct-10	8:00	M	No	36	46	1.6	3	10
WDL 066	1	PP	2	1		14-Oct-10	10:00	M	No	48	55	3.7	3	13
WDL 060	1	RH	2	1		15-Oct-10	11:00	F	No	45	53	3.4	3	7
WDL 067	1	PP	5	3		15-Oct-10	10:00	M	No	42	55	2.3	3	14
WDL 073	1	PP	3	3		15-Oct-10	17:00	J	No	38	45	1.5	4	3
WDL 074	1	RH	6	1		15-Oct-10	17:00	F	No	43	38	2.9	3	16
WDL 075	1	PP	1	5		15-Oct-10	17:00	M	No	38	44	1.6	3	18
WDL 076	1	PP	1	5		15-Oct-10	17:00	M	No	25	30	0.5	3	17
WDL 080	1	RH	5	6		4-Mar-11	17:00	F	No	52	61	2.8	3	19
WDL 081	1	RH	7	3		5-Mar-11	17:00	F	No	42	50	2.5	4	6
WDL 087	1	RH	3	4		2-Apr-11	16:00	F	No	33	41	1.2	4	7
WDL 088	1	RH	3	6		2-Apr-11	16:00	F	No	39	46	2	4	8
WDL 089	1	RH	3	7		2-Apr-11	16:00	M	No	51	64	4.2	4	9
WDL 090	1	RH	1	6		2-Apr-11	16:00	M	No	68	87	11.2	8	
WDL 091	1	RH	7	1		2-Apr-11	16:00	M	No	71	81	13	4	10
WDL 091	2	RH	7	2		7-Apr-11	11:00	M	No	71	81	12.3	4	10

WDL 102	1	RH	4	5		7-Apr-11	11:00	F	No	58	61	5.7	1	
WDL 103	1	RH	7	1		7-Apr-11	11:00	F	No	44	41	2.9	2	
WDL 104	1	RH	3	3		7-Apr-11	11:00	F	No	43	56	3	3	
WDL 105	1	PP	3	2		7-Apr-11	11:00	F	No	40	48	1.9	1	
WDL 113	1	PP	4	1		7-Apr-11	17:00	M	No	50	38	4	1	
WDL 114	1	RH	1	3		7-Apr-11	17:00	F	No	35	43	1.4	2	
WDL 115	1	PP	1	5		7-Apr-11	17:00	F	No	37	48	1.7	3	
WDL 121	1	PP	3	2		8-Apr-11	18:00	M	No	48	43	3.4	2	
WDL 122	1	PP	2	2		8-Apr-11	18:00	F	No	65	71	7.3	4	
WDL 123	1	PP	2	6		8-Apr-11	18:00	M	No	52	58	4.7	3	
WDL 124	1	PP	1	6		8-Apr-11	18:00	F	No	46	57	3.3	5	
WDL 126	1	RH	7	3		8-Apr-11	18:00	F	No	50	60	4	5	
WDL 130	1	PP	5	6		8-Apr-11	18:00	M	No	69	81	9.2	4	
WDL 125	1	RH	6	5		9-Apr-11	18:00	F	No	53	62	4.5	4	
WDL 127	1	RH	5	5		9-Apr-11	18:00	F	No	47	57	2.9	6	
WDL 128	1	RH	4	5		9-Apr-11	18:00	F	No	35	29	0.9	7	
WDL 129	1	RH	R	2		9-Apr-11	18:00	F	No	41	50	2.1	8	

WDL 131	1	RH	3	7		9-Apr-11	8:00	M	No	44	50	2.5	2	
WDL 132	1	PP	3	6		9-Apr-11	18:00	F	No	36	47	1.3	6	
WDL 133	1	PP	2	6		9-Apr-11	18:00	F	No	44	52	2.5	7	
WDL 142	1	RH	R	4		19-May-11	18:00	M	No	60	42	6.1	3	
WDL 143	1	RH	5	4		19-May-11	18:00	M	No	73	88	9.8	4	
WDL 144	1	RH	6	1		19-May-11	18:00	M	No	55	68	4.8	3	9
WDL 145	1	RH	2	3		19-May-11	12:00	F	No	62	74	7.2	9	
WDL 146	1	PP	2	5		19-May-11	10:00	F	No	46	57	3.8	8	
WDL 158	1	RH	3	9		19-May-11	19:00	M	No	46	59	3	5	
WDL 169	1	RH	2	3		19-May-11	12:00	F	No	63	74	7.2	11	
WDL 165	1	RH	4	4		21-May-11	18:00	F	No	48	61	3.4	10	
WDL 175	1	PP	4	6		21-May-11	11:00	F	No	63	73	5.6	9	
WDL 176	1	RH	5	2		21-May-11	7:00	M	No	51	61	4.4	7	
WDL 177	1	RH	2	3		21-May-11	18:00	M	No	70	85	9.4	9	
WDL 179	1	RH	5	4		21-May-11	19:00	F	No	52	20	3.5	13	
WDL 181	1	RH	3	1		21-May-11	7:00	F	No	46	58	2.7	14	
WDL 182	1	PP	3	5		21-May-11	19:00	F	No	63	72	6	10	

WDL 172	1	RH	R	1		22-May-11	7:00	M	No	70	66	10.5	6	
WDL 185	1	RH	1	4		22-May-11	17:00	F	No	41	51	2.1	15	
WDL 186	1	RH	R	4		22-May-11	17:00	M	No	48	61	3.2	10	
WDL 187	1	RH	R	2		22-May-11	17:00	F	No	53	59	4.4	16	
WDL 189	1	RH	1	6		22-May-11	17:00	F	No	61	20	6	17	
WDL 144	2	RH	6	2		4-Jun-11	19:00	M	No	55	63	4.4	3	9
WDL 205	1	RH	7	2		4-Jun-11	19:00	M	No	57	56	5	13	
WDL 206	1	PP	1	2		4-Jun-11	9:00	M	No	38	46	1.1	5	
WDL 207	1	PP	4	3		4-Jun-11	19:00	M	No	59	71	5.6	6	
WDL 208	1	PP	5	6		4-Jun-11	19:00	F	No	38	47	6.1	13	
WDL 209	1	RH	2	2		4-Jun-11	19:00	F	Yes	54	64	5.2	1	6
WDL 210	1	RH	5	5		4-Jun-11	19:00	F	No	50	59	3.4	1	9
WDL 211	1	RH	4	1		4-Jun-11	10:00	F	No	40	48	1.2	1	10
WDL 212	1	RH	3	9		4-Jun-11	19:00	F	No	46	52	3.1	1	15
WDL 115	2	PP	1	5		11-Jun-11	19:00	F	No	54	62	4.7	3	
WDL 219	1	RH	6	6		11-Jun-11	20:00	M	No	57	44	4.9	14	
WDL 221	1	RH	2	4		11-Jun-11	20:00	M	No	57	68	5.3	15	

WDL 223	1	RH	7	6		11-Jun-11	20:00	F	No	63	74	7.6	1	16
WDL 224	1	RH	5	3		11-Jun-11	19:00	F	No	54	63	4	1	18
WDL 225	1	RH	R	4		11-Jun-11	19:00	M	No	68	80	9	16	
WDL 226	1	PP	1	5		11-Jun-11	19:00	F	No	48	60	4	14	
WDL 233	1	RH	2	3		17-Jun-11	18:00	F	No	63	74	7	1	20
WDL 234	1	RH	R	4		17-Jun-11	18:00	F	No	49	56	3.4	2	6
WDL 235	1	RH	6	4		17-Jun-11	19:00	M	No	53	64	4.4	17	
WDL 113	2	PP	3	1		18-Jun-11	10:00	M	No	52	42	3.6	1	
WDL 224	2	RH	5	4		18-Jun-11	18:00	F	No	55	63	4.4	1	18
WDL 240	1	PP	3	4		18-Jun-11	19:00	F	No	60	65	5.6	15	
WDL 241	1	RH	5	2		18-Jun-11	18:00	F	No	45	41	2.8	2	7
WDL 242	1	RH	7	5		18-Jun-11	18:00	M	No	61	73	6.7	20	
WDL 243	1	PP	1	2		18-Jun-11	20:00	M	No	52	65	3.8	7	
WDL 244	1	RH	4	2		18-Jun-11	18:00	F	No	52	64	4.4	2	8
VMS 004*	1	RH	3	3		25-Jun-11	19:00	M	No	69	31	8.3	12	
WDL 115	3	PP	1	5		25-Jun-11	18:00	F	Yes	54	66	4.9	3	
WDL 158	2	RH	3	9		25-Jun-11	9:00	M	No	51	63	3.9	5	

WDL 209	2	RH	2	2		25-Jun-11	19:00	F	No	54	65	4.8	1	6
WDL 219	2	RH	6	6		25-Jun-11	19:00	M	No	57	42	4.5	14	
WDL 234	2	RH	R	4		25-Jun-11	19:00	F	No	49	57	3.2	2	6
WDL 248	1	PP	1	1		25-Jun-11	9:00	F	No	48	60	3.3	16	
WDL 257	1	PP	1	6		25-Jun-11	18:00	M	No	66	85	8.7	8	
WDL 260	1	RH	7	5		25-Jun-11	19:00	M	No	71	85	8.9	1	9
WDL 143	2	RH	5	4		9-Jul-11	19:00	M	No	72	88	10	4	
WDL 172	2	RH	R	1		9-Jul-11	19:00	M	No	71	68	10.2	6	
WDL 257	2	PP	1	6		9-Jul-11	19:00	M	No	67	86	9.6	8	
WDL 270	1	RH	5	4		9-Jul-11	19:00	M	No	54	65	4.6	1	10
WDL 271	1	PP	3	6		9-Jul-11	19:00	M	No	62	75	6.4	9	
WDL 272	1	PP	1	6		9-Jul-11	19:00	M	No	75	86	9.7	10	
WDL 273	1	PP	2	2		9-Jul-11	19:00	F	No	54	65	4.5	17	
WDL 274	1	RH	R	3		9-Jul-11	19:00	F	No	50	54	3.3	2	9
WDL 045	2	RH	7	2		16-Jul-11	9:00	F	Yes	55	64	5.2	1	11
WDL 115	4	PP	1	5		16-Jul-11	19:00	F	Yes	58	71	6.7	3	
WDL 260	2	RH	7	6		16-Jul-11	19:00	M	No	70	85	9.4	1	9

WDL 282	1	PP	4	1		16-Jul-11	9:00	M	No	50	61	0	13	
WDL 297	1	RH	1	1		16-Jul-11	19:00	F	No	58	74	7.1	2	10
WDL 298	1	RH	5	3		16-Jul-11	19:00	F	No	57	63	6	2	11
WDL 299	1	RH	5	2		16-Jul-11	19:00	M	No	60	73	6	1	15
WDL 300	1	RH	R	5		16-Jul-11	19:00	M	No	68	64	9.3	1	16
WDL 301	1	PP	1	3		16-Jul-11	19:00	F	No	56	57	6	18	
WDL 302	1	PP	2	6		16-Jul-11	19:00	M	No	62	71	7.5	14	
WDL 303	1	RH	7	4		16-Jul-11	19:00	M	No	51	66	4.4	1	17
VMS 010*	1	PP	5	5		23-Jul-11	18:00	F	Yes	49	61	4.2	2	
WDL 314	1	RH	R	5		23-Jul-11	9:00	M	No	53	68	4.1	1	18
WDL 315	1	PP	3	4		23-Jul-11	17:00	F	No	61	52	7.1	1	7
WDL 316	1	RH	7	5		23-Jul-11	17:00	F	Yes	55	60	5.7	2	13
WDL 317	1	RH	4	6		23-Jul-11	18:00	F	No	54	61	6.2	2	14
WDL 115	5	PP	1	4		29-Jul-11	19:00	F	Yes	60	73	6.5	3	
WDL 131	2	RH	R	4		29-Jul-11	19:00	M	No	63	39	6.4	2	
WDL 205!	2	RH	7	3		29-Jul-11	19:00	M	No	75	90	11.7	13	
WDL 272	2	PP	1	4		29-Jul-11	19:00	M	No	78	87	12.3	10	

WDL 298	2	RH	1	2		29-Jul-11	19:00	F	Yes	57	62	7.5	2	11
WDL 327	1	RH	3	2		29-Jul-11	20:00	F	Yes	56	66	6.4	3	8
WDL 328	1	RH	7	4		29-Jul-11	19:00	F	Yes	55	64	5.8	3	9
WDL 329	1	RH	6	4		29-Jul-11	19:00	F	Yes	54	63	6.1	3	10
WDL 330	1	RH	2	6		29-Jul-11	20:00	F	No	59	67	7.6	3	13
WDL 331	1	PP	3	6		29-Jul-11	19:00	F	Yes	56	67	5.7	1	8
VMS 012*	1	RH	7	3		30-Jul-11	8:00	M	No	54	65	4.7	1	19
VMS 013*	1	RH	7	1		30-Jul-11	19:00	M	No	72	86	11.6	4	10
VMS 014*	1	RH	3	2		30-Jul-11	19:00	M	No	48	37	1.5	14	
WDL 103	2	RH	7	2		30-Jul-11	19:00	F	Yes	52	49	4.8	2	
WDL 282	2	PP	4	2		30-Jul-11	19:00	M	No	56	66	4.9	13	
WDL 341	1	RH	R	3		30-Jul-11	19:00	F	Yes	58	47	8.5	2	15
WDL 342	1	RH	1	4		30-Jul-11	19:00	F	Yes	61	73	9.4	2	20
WDL 343	1	RH	R	3		30-Jul-11	19:00	F	Yes	54	69	5.7	2	17
WDL 344	1	RH	7	3		30-Jul-11	19:00	F	Yes	53	65	6.1	2	18
WDL 345	1	RH	6	1		30-Jul-11	19:00	F	Yes	56	63	6.5	3	6
WDL 346	1	PP	3	4		30-Jul-11	19:00	F	Yes	50	49	2	8	

WDL 122	2	PP	1	5		6-Aug-11	19:00	F	Yes	60	71	6.6	4	
WDL 207	2	PP	3	5		6-Aug-11	19:00	M	No	67	79	9.2	6	
WDL 270	2	RH	1	4		6-Aug-11	19:00	M	No	60	71	6.1	1	10
WDL 282	3	PP	3	4		6-Aug-11	19:00	M	No	57	69	5	13	
WDL 363	1	RH	1	4		6-Aug-11	19:00	M	No	71	88	11.6	2	6
WDL 365	1	RH				6-Aug-11	11:00	M	No	67	78	9.3	2	7
WDL 066	2	PP	1	1		7-Aug-11	19:00	M	No	64	50	7.6	3	13
WDL 235	2	RH	7	1		7-Aug-11	19:00	M	No	61	69	5.7	17	
WDL 272	3	PP	1	5		7-Aug-11	19:00	M	No	75	85	10.5	10	
WDL 299	2	RH	5	2		7-Aug-11	19:00	M	No	62	74	7.7	1	15
WDL 316	2	RH	7	6		7-Aug-11	19:00	F	Yes	56	57	4.9	2	13
WDL 344	2	RH	1	4		7-Aug-11	19:00	F	Yes	56	64	6.9	2	18
WDL 364!	1	RH	1	3		7-Aug-11	19:00	F	Yes	67	53	8.8		
WDL 366	1	PP	4	6		7-Aug-11	19:00	M	No	60	72	5.8	1	7
WDL 273	2	PP	2	3		8-Aug-11	18:00	F	Yes	57	15	5.4	17	
WDL 368	1	RH	1	4		8-Aug-11	19:00	F	Yes	52	32	4.2	4	6
WDL 369	1	RH	7	4		8-Aug-11	19:00	M	No	61	78	6.6	2	9

WDL 370	1	RH	1	4		8-Aug-11	19:00	M	No	62	30	6.1	2	8
WDL 142	2	RH	6	4		9-Aug-11	9:00	M	No	74	70	11.7	3	
WDL 143	3	RH	5	3		9-Aug-11	19:00	M	No	73	12	10.1	4	
WDL 177	2	RH	7	6		9-Aug-11	20:00	M	No	74	86	16.3	9	
WDL 207	3	PP	3	4		9-Aug-11	19:00	M	No	68	81	15.9	6	
WDL 371	1	RH	7	1		9-Aug-11	9:00	F	Yes	59	54	9.4	3	15
WDL 383	1	RH	4	3		9-Aug-11	20:00	M	No	56	59	5.1	2	10
WDL 177	3	RH	2	3		10-Aug-11	9:00	M	No	74	88	11.5	9	
WDL 387	1	RH	5	2		10-Aug-11	19:00	F	No	64	37	0		
WDL 391	1	PP	1	1		10-Aug-11	19:00	F	Yes	61	71	8.2	1	9
WDL 392	1	RH	1	2		10-Aug-11	19:00	F	Yes	59	67	7.1	3	17
VMS 017*	1	RH	R	1		11-Aug-11	19:00	F	No	54	57	4.5	12	15
WDL 165	2	RH	4	3		11-Aug-11	19:00	F	Yes	56	47	5.6	10	
WDL 207	4	PP	3	4		11-Aug-11	9:00	M	No	67	79	8.5	6	
WDL 210	2	RH	1	1		11-Aug-11	19:00	F	Yes	60	68	7.5	1	9
WDL 219	3	RH	6	4		11-Aug-11	19:00	M	No	66	37	6.2	14	
WDL 315	2	PP	3	3		11-Aug-11	19:00	F	Yes	63	15	7.2	1	7

WDL 390	1	RH	5	3		11-Aug-11	10:00	F	Yes	57	66	6.7	4	8
WDL 393	1	PP	5	1		11-Aug-11	9:00	F	Yes	64	70	8.6	1	10
WDL 407	1	PP	5	3		11-Aug-11	19:00	M	No	61	74	5.8	1	8
WDL 408	1	RH	3	8		11-Aug-11	19:00	F	Yes	58	67	7	3	20
WDL 409	1	RH	3	8		11-Aug-11	19:00	M	No	60	50	8.1	2	11
WDL 165	3	RH	4	3		12-Aug-11	19:00	F	Yes	57	49	5.4	10	
WDL 219	4	RH	6	4		12-Aug-11	19:00	M	No	66	37	5.9	14	
WDL 271	2	PP	4	5		12-Aug-11	18:00	M	No	65	78	7.3	9	
WDL 408	2	RH	3	8		12-Aug-11	19:00	F	Yes	58	67	6.9	3	20
WDL 409	2	RH	3	8		12-Aug-11	19:00	M	No	68	49	7.3	2	11
WDL 418	1	PP	5	4		12-Aug-11	18:00	F	Yes	55	61	5.9	1	11
WDL 418.2	1	RH	R	6		12-Aug-11	16:00	F	Yes	60	64	7.3	4	9
WDL 419	1	RH	5	3		12-Aug-11	17:00	F	Yes	59	72	8.1	4	10
WDL 115	6	PP	1	5		13-Aug-11	16:00	F	Yes	60	73	6.1	3	
WDL 224	3	RH	5	4		13-Aug-11	15:00	F	No	60	68	7.1	1	18
WDL 270	3	RH	1	3		13-Aug-11	15:00	M	No	62	72	6.3	1	10
WDL 272	4	PP	1	5		13-Aug-11	16:00	M	No	77	85	10.9	10	

WDL 407	2	RH	4	3		13-Aug-11	16:00	M	No	61	74	5.6	1	8
WDL 420	1	RH	4	3		13-Aug-11	15:00	F	Yes	55	64	6.2	4	11
VMS 018*	1	RH	6	2		20-Aug-11	9:00	M	No	64	61	6.8	3	9
WDL 260	3	RH	7	6		20-Aug-11	17:00	M	No	72	86	10.2	1	9
WDL 315	3	PP	3	5		20-Aug-11	17:00	F	No	62	15	6	1	7
WDL 368	2	RH	1	4		20-Aug-11	17:00	F	Yes	53	37	4.5	4	6
WDL 428	1	RH	3	8		20-Aug-11	17:00	M	No	70	83	8.9	2	13
WDL 429	1	PP	3	3		20-Aug-11	17:00	F	Yes	52	49	4.6	1	16
WDL 182	2	PP	3	5		27-Aug-11	19:00	F	Yes	63	68	6	10	
WDL 330	2	RH	2	6		27-Aug-11	19:00	F	Yes	60	67	6.6	3	13
VMS 019*	1	PP	1	6		10-Sep-11	8:00	M	No	75	72	12.6	18	19
WDL 115	7	PP	1	5		10-Sep-11	19:00	F	No	61	74	6	3	
WDL 142	3	RH	6	4		10-Sep-11	9:00	M	No	73	70	11.8	3	
WDL 182	3	PP	3	5		10-Sep-11	19:00	F	No	63	69	6.7	10	
WDL 219	5	RH	4	5		10-Sep-11	8:00	M	No	69	82	10.5	14	
WDL 257	3	PP	1	6		10-Sep-11	8:00	M	No	69	89	10.4	8	
WDL 316	3	RH	7	6		10-Sep-11	19:00	F	Yes	56	60	5.9	2	13

WDL 438	1	RH	3	7		10-Sep-11	9:00	M	No	67	79	8.5	2	14
WDL 439	1	PP	2	1		10-Sep-11	19:00	M	No	59	77	6.9	15	
WDL 440	1	PP	1	1		10-Sep-11	19:00	M	No	65	79	8.1	16	
VMS 012R *	2	RH	7	4		17-Sep-11	18:00	M	No	61	74	8.6	1	19
WDL 448	1	RH	R	5		17-Sep-11	8:00	M	No	69	84	11.4	1	20
WDL 449	1	PP	1	4		17-Sep-11	18:00	M	No	30	36	0.9	17	
WDL 450	1	RH	2	3		17-Sep-11	19:00	M	No	28	22	0.7	2	15
WDL 451	1	PP	2	5		17-Sep-11	18:00	F	No	25	31	0.5	20	
WDL 452	1	PP	3	5		17-Sep-11	18:00	F	No	30	42	0.8	1	13
WDL 453	1	PP	1	5		17-Sep-11	18:00	F	No	28	17	0.6	1	14
WDL 454	1	RH	2	1		17-Sep-11	17:00	F	No	26	34	0.7	4	13
WDL 460	1	PP	2	4		24-Sep-11	18:00	M	No	32	41	0.9	18	
WDL 461	1	PP	3	3		24-Sep-11	18:00	F	No	28	34	0.7	1	17
WDL 463	1	RH	6	3		24-Sep-11	18:00	F	No	34	41	1.2	4	15
WDL 464	1	RH	5	5		24-Sep-11	18:00	F	Yes	63	35	8.4	4	16
WDL 461	1	PP	3	3		24-Sep-11	18:00	F	No	28	34	0.7	1	17
WDL 462	1	RH	6	2		24-Sep-11	18:00	F	No	34	44	1.4	4	14

WDL 463	1	RH	6	3		24-Sep-11	18:00	F	No	34	41	1.2	4	15
WDL 393	2	PP	4	1		13-Oct-11	17:00	F	No	63	69	10.2	1	10
WDL 468	1	PP	5	3		13-Oct-11	17:00	M	No	71	76	12.2	1	9
WDL 469	1	RH	4	3		13-Oct-11	17:00	M	No	38	45	1.7	2	16
WDL 470	1	RH	3	7		13-Oct-11	8:00	M	No	39	44	2	2	17
WDL 477	1	RH	5	2		14-Oct-11	10:00	F	No	56	37	6.5	4	17
WDL 371	2	RH	7	1		15-Oct-11	19:00	F	No	59	54	8.2	3	15
WDL 480	1	RH	5	4		15-Oct-11	10:00	M	No	36	45	1.4	3	7
WDL 481	1	RH	3	2		15-Oct-11	10:00	F	No	34	37	1.2	3	18
WDL 482	1	RH	3	9		15-Oct-11	10:00	F	No	40	51	2.3	4	18
WDL 483	1	RH	5	2		15-Oct-11	18:00	M	No	34	42	1.4	2	18
WDL 484	1	RH	5	1		15-Oct-11	18:00	F	No	36	47	1.7	4	20
WDL 461	2	PP	3	3		15-Oct-11	17:00	F	No	34	41	1.2	1	17
WDL 485	1	PP	3	3		15-Oct-11	17:00	F	No	33	41	1.3	1	18
WDL 486	1	PP	5	2		15-Oct-11	17:00	F	No	33	40	1.2	1	19
WDL 487	1	PP	1	1		15-Oct-11	17:00	M	No	40	42	2.1	3	8
WDL 315	4	PP	3	3		15-Oct-11	17:00	F	No	63	34	8	1	7

WDL 158	3	RH	3	8		26-Oct-11	16:00	M	No	72	88	13.1	5	
WDL 493	1	RH	R	1		26-Oct-11	16:00	M	No	41	50	2.6	5	7
WDL 494	1	PP	1	3		26-Oct-11	17:00	M	No	27	32	0.4	5	7
WDL 495	1	PP	1	2		26-Oct-11	17:00	M	No	26	31	0.6	5	8
WDL 496	1	PP	1	6		6-Nov-11	18:00	F	No	39	44	2.1	20	
WDL 115	8	PP	1	5		29-Mar-12	18:00	F	No	62	73	7.2	3	
WDL 503	1	PP	2	5		29-Mar-12	18:00	F	No	60	72	7.7	2	6
WDL 512	1	RH	1	2		30-Mar-12	18:00	M	No	60	55	6.9	2	20
WDL 513	1	RH	2	2		30-Mar-12	10:00	M	No	44	52	2.6	3	10
WDL 448	2	RH	R	4		30-Mar-12	18:00	M	No	72	40	13.3	1	20
WDL 514	1	RH	4	6		30-Mar-12	8:00	M	No	50	62	4.1	3	11
WDL 282	4	PP	5	4		30-Mar-12	18:00	M	No	68	83		13	
WDL 518	1	RH	1	2		31-Mar-12	18:00	M	No	76	83	15.1	3	13
WDL 207	5	PP	4	3		31-Mar-12	18:00	M	No	73	86	12.9	6	
WDL 519	1	RH	7	2		31-Mar-12	18:00	F	No	40	51	2.2	5	6
WDL 219	6	RH	4	5		14-Apr-12	18:00	M	No	72	87	12	14	
WDL 331	2	PP	4	5		14-Apr-12	17:00	F	No	58	73	6.5	1	8

WDL 525	1	PP	4	1		14-Apr-12	17:00	F	No	51	65	3.6	2	7
WDL 133	2	PP	4	1		28-Apr-12	18:00	F	No	53	50	4.2	7	
WDL 460	2	PP	2	1		28-Apr-12	18:00	M	No	52	35	3.8	18	
WDL 464	2	RH	5	6		28-Apr-12	20:00	F	No	62	38	8.3	4	16
WDL 540	1	RH				16-May-12	12:00	F	No	51	62	4.4	5	7
WDL 393	3	PP	5	1		16-May-12	18:00	F	No	66	73	8.5	1	10
WDL 541	1	PP	4	2		16-May-12	9:30	M	No	72	78	12.4	1	13
WDL 551	1	PP	3	3		16-May-12	10:00	F	No	50	56	3.5	3	9
WDL 552	1	RH	2	1		17-May-12	7:30	F	No	55	60	5.3	5	8
WDL 208	2	PP	5	4		17-May-12	9:45	F	No	50	64	4	13	
VMS ?	?	RH	1	4		17-May-12	19:00	M	No	72	90	11.2	19	
WDL 554	1	PP	3	2		16-May-12	18:00	M	No	59	70	5.6	1	14
WDL 555	1	RH	7	5		17-May-12	7:45	M	No	61	75	7	2	711
WDL 126	2	RH	5	1		17-May-12	19:00	F	No	51	64	4.8	5	
WDL 512	2	RH	1	3		18-May-12	18:00	M	No	67	63	8.2	2	20
WDL 272	5	PP	1	5		18-May-12	18:00	M	No	77	87	12.8	10	
WDL 563	1	PP	1	2		18-May-12	18:00	F	No	41	54	2.3	2	8

WDL 564	1	PP	5	5		18-May-12	18:00	M	No	43	54	2.2	1	15
WDL 565	1	RH	R	4		18-May-12	18:00	F	No	52	35	4.5	5	9
WDL 257	4	PP	2	2		19-May-12	19:00	M	No	70	85	10.8	8	15
WDL 577	1	PP	1	6		19-May-12	8:00	M	No	68	72	5.7	1	16
WDL 115	9	PP	1	6		19-May-12	8:00	F	No	63	77	7.5	3	
WDL 578	1	PP	2	2		19-May-12	19:00	M	No	77	78	14.7	1	17
WDL 579	1	RH	5	4		19-May-12	8:00	F	No	57	64	4.3	5	10
WDL 272	6	PP	1	5		19-May-12	19:00	M	No	77	88	12.5	10	
WDL 393	4	PP	5	1		19-May-12	19:00	F	No	65	73	8.1	1	10
WDL 525	2	PP	4	2		19-May-12	19:00	F	No	58	54	5.7	2	7
WDL 580	1	RH	R	4		19-May-12	19:00	F	No	56		4.7	5	11
WDL 594	1	PP	2	6		9-Jun-12	18:00	M	No	63	73	8.1	2	6
WDL 595	1	RH	3	8		9-Jun-12	19:30	M	No	63	75	7.7	4	8
WDL 366	2	PP	5	3		9-Jun-12	18:00	M	No	74	87	12.7	1	7
WDL 525	3	PP	4	1		9-Jun-12	18:00	F	No	60	63	6.3	2	7
WDL 272	7	PP	1	6		9-Jun-12	18:00	M	No	77	88	12.7	10	
WDL 601	1	RH	4	3		16-Jun-12	20:00	F	No	58	69	6	5	13

WDL 102	2	RH	2	2		16-Jun-12	20:00	F	No	62	74	7.6	1	
WDL 207	6	PP	3	5		30-Jun-12	7:00	M	No	78	91	13.9	6	
WDL 552	2	RH	2	1		30-Jun-12	19:00	F	No	57	64	6.3	5	8
WDL 614	1	RH	R	2		29-Jun-12	19:00	F	No	60	69	6.8	5	14
WDL 617	1	RH	5	2		30-Jun-12	19:00	M	No	70	92	11.4	3	16
WDL 615	1	RH				29-Jun-12	16:00	M	No	71	90	10.6	3	15
WDL 616	1	RH	R	1		30-Jun-12	19:00	F	Yes	58	71	7	5	15
WDL 618	1	RH				29-Jun-12	16:00	F	Yes	62	67	6.7	5	16
WDL 619	1	PP	3	4		30-Jun-12	20:00	M	No	63	77	7.1	2	7
WDL 242	2	RH	7	1		30-Jun-12	9:30	M	No	75	83	13.4	20	
WDL 632	1	RH	6	1		14-Jul-12	9:30	M	No	65	81	8.4	3	17
WDL 633	1	RH	R	2		14-Jul-12	9:00	M	No	70	88	11	3	18
WDL 634	1	RH	7	2		14-Jul-12	9:10	M	No	66	84	8.5	3	20
WDL 635	1	RH	6	1		14-Jul-12	9:30	M	No	73	70	13.7	4	11
WDL 637	1	RH	7	4		14-Jul-12	19:30	F	No	56	65	5	5	17
WDL 638	1	PP	2	3		14-Jul-12	19:00	M	No	66	86	8.1	2	8
WDL 640	1	RH	R	4		14-Jul-12	9:00	M	No	69	88	9.4	4	13

WDL 641	1	PP	3	5		14-Jul-12	19:00	M	No	64	77	7.6	2	9
WDL 619	2	PP	3	5		14-Jul-12	19:00	M	No	63	76	6.7	2	7
WDL 642	1	PP	2	2		14-Jul-12	7:00	F	No	57	64	6.1	2	9
WDL 643	1	PP	1	3		14-Jul-12	7:00	M	No	59	75	6.1	2	10
WDL 580	2	RH	R	4		14-Jul-12	9:00	F	No	59	69	5.9	5	11
WDL 650	1	RH	6	2		28-Jul-12	19:45	F	Yes	60	65	6.7	5	18
WDL 300	2	PP	1	5		4-Aug-12	18:30	M	No	68	83	8.9	1	16
WDL 643	2	PP	1	2		4-Aug-12	10:56	M	No	64	40	6.1	2	10
WDL 638	2	PP	2	4		4-Aug-12	18:30	M	No	68	85	8.3	2	8
WDL 270	4	RH	5	4		4-Aug-12	19:30	M	No	75	49	11.5	1	10
WDL 662	1	RH	R	6		4-Aug-12	19:30	M	No	74	95	12.4	4	14
WDL 012	2	RH	R	1		4-Aug-12	19:10	F	Yes	62	78	7.9	20	5
WDL 540	2	PP	3	4		4-Aug-12	8:00	F	Yes	59	69	5.8	5	7
WDL 672	1	PP	2	5		11-Aug-12	19:30	F	Yes	57	54	5.3	2	10
WDL 316	4	RH	7	6		11-Aug-12	20:00	F	Yes	64	64	8.1	2	13
WDL 673	1	RH	3	2		11-Aug-12	20:00	M	No	64	76	9	4	15
WDL 674	1	RH	1	1		11-Aug-12	19:00	F	Yes	65	73	8.2	6	11

WDL 675	1	PP	4	1		11-Aug-12	19:30	M	No	70	87	9.8	2	11
WDL 676	1	RH	2	3		11-Aug-12	20:00	M	No	33	41	1.3	4	16
WDL 681	1	RH	7	2		25-Aug-12	19:30	F	Yes	60	68	5	6	13
WDL 682	1	RH	5	2		25-Aug-12	19:30	F	No	60	72	5.9	6	14
WDL 683	1	RH	6	5		25-Aug-12	9:45	F	Yes	62	76	7.8	6	15
WDL 409	3	RH	4	6		25-Aug-12	19:30	M	No	77	70	13	2	11
WDL 684	1	RH	3	2		25-Aug-12	9:00	M	No	65	85	7.1	5	8
WDL 393	5	PP	4	1		7-Sep-12	19:00	F	Yes	65	74	8.1	1	10
WDL 496	2	PP	1	6		7-Sep-12	18:30	F	Yes	59	63	7.8	20	
WDL 619	3	PP	4	3		7-Sep-12	19:00	M	No	65	53	7.7	2	7
WDL 672	1	RH				7-Sep-12	10:30	M	No	73	65	11.7	4	17
WDL 673	1	RH	1	4		7-Sep-12	19:30	M	No	68	76	8.9	4	18
WDL 674	1	RH	4	2		7-Sep-12	19:00	F	No	24	32	0.4	6	16
WDL 675	1	PP	5	6		7-Sep-12	18:30	M	No	25	32	0.4	2	13
WDL 682	1	PP	4	6		8-Sep-12	18:00	M	No	65	67	7.5	5	9
WDL 691	1	RH	R	5		22-Sep-12	18:00	F	No	27	18	0.5	6	17
WDL 692	1	RH	4	5		22-Sep-12	19:00	M	No	29	38	0.9	5	10

WDL 693	1	PP	5	1		22-Sep-12	18:30	F	No	60	74	6.3	3	11
WDL 673	2	RH				22-Sep-12	16:20	M	No	73	67	12.7	4	18
WDL 694	1	RH	6	2		22-Sep-12	19:00	M	No	27	36	0.8	4	20
WDL 682	2	PP	3	6		22-Sep-12	18:30	M	No	67	70	9.5	5	9
WDL 699	1	RH	R	4		11-Oct-12	13:00	F	No	25	27	0.5	6	18
WDL 700	1	RH	R	2		11-Oct-12	18:30	F	No	35	45	1.4	6	20
WDL 637	2	RH	7	3		11-Oct-12	9:30	F	Yes	58	66	5.9	5	17
WDL 702	1	PP	1	4		11-Oct-12	8:00	F	Yes	60	69	8.5	2	11
WDL 673	3	RH				10-Oct-12	15:20	M	No	75	67	15.4	4	18
WDL 615	2	RH				10-Oct-12	15:20	M	No	75	92	14.5	3	15
WDL 709	1	RH	4	6		12-Oct-12	10:00	M	No	54	68	5.5	5	6
WDL 710	1	RH	1	4		12-Oct-12	8:00	F	No	29	37	0.7	7	11
WDL 711	1	PP	3	2		12-Oct-12	8:00	M	No	37	49	8.6	2	14
WDL 712	1	RH	R	4		12-Oct-12	18:00	M	No	39	51	1.9	5	11
WDL 717	1	RH	2	5		13-Oct-12	18:00	M	No	37	45	1.5	5	13
WDL 718	1	RH	4	6		13-Oct-12	18:00	F	No	35	37	0.8	7	13
WDL 719	1	RH	4	5		13-Oct-12	18:00	F	No	31	40	0.9	7	14

WDL 720	1	RH	5	5		13-Oct-12	18:00	F	No	25	31	0.5	7	15
WDL 721	1	PP	4	5		13-Oct-12	17:30	F	No	28	36	0.7	2	13
WDL 723	1	RH	R	3		13-Oct-12	16:30	M	No	44	50	2.3	5	14
WDL 724	1	PP	5	2		13-Oct-12	11:00	M	No	47	60	3.3	2	15
WDL 725	1	RH	R	4		13-Oct-12	16:00	F	No	60	71	8	7	16
WDL 730	1	RH	4	6		3-Nov-12	18:00	M	No	31	39	1.3	5	15
WDL 731	1	PP	2	2		3-Nov-12	17:00	F	No	31	38	1.1	2	14
WDL 732	1	PP	2	4		3-Nov-12	17:00	M	No	34	44	1.5	2	16
WDL 733	1	PP	3	5		3-Nov-12	17:30	M	No	33	29	1.5	2	17
WDL 734	1	RH	4	3		3-Nov-12	18:00	M	No	45	55	3.7	5	16
WDL 717	2	RH	4	2		3-Nov-12	18:00	M	No	43	52	3	5	13
WDL 735	1	RH	3	4		3-Nov-12	18:00	F	No	34	42	0.9	7	17
WDL 736	1	RH	5	4		3-Nov-12	18:00	M	No	70	82	11.5	5	17
WDL 721	2	PP	4	4		22-May-13	18:00	F	No	40	52	1.6	2	13
WDL 786	1	PP	5	2		22-May-13	18:00	F	No	48	60	2.7	2	17
WDL 787	1	RH	5	5		22-May-13	18:30	F	No	48	63	2.8	2	186
WDL 788	1	PP	2	1		22-May-13	17:30	F	No	51	54	3.2	2	20

WDL 789	1	RH	R	2		22-May-13	18:00	M	No	47	55	2.7	6	15
WDL 790	1	RH	6	4		22-May-13	7:30	M	No	46	55	3.3	6	16
WDL 791	1	PP	1	3		22-May-13	18:00	M	No	56	67	4.4	3	7
WDL 724	3	PP	4	4		22-May-13	18:00	M	No	60	75	5.1	2	15
WDL 642	2	PP	2	3		22-May-13	17:45	F	No	61	70	7.1	2	9
WDL 102	3	RH	2	2		22-May-13	18:30	F	Yes	66	76	9.3	1	
WDL 792	1	RH	5	3		22-May-13	8:00	M	No	77	95	14.4	6	17
WDL 383	2	PP	1	3		22-May-13	18:00	M	No	72	72	12.4	2	10
WDL 540	3	PP	3	4		23-May-13	8:00	F	No	63	74		5	7
WDL 393	6	PP	5	1		23-May-13	8:00	F	No	68	75	9.9	1	10
WDL 798	1	PP	2	5		23-May-13	7:30	F	No	43	54	2.5	3	6
WDL 799	1	RH	R	4		23-May-13	7:00	F	No	48	57	3.3	2	20
VMS ?	?	RH	R	3		23-May-13	7:00	M	No	79	85	17.3	19	
WDL 823	1	PP	2	2		24-May-13	17:00	M	No	47	58	4.2	3	10
GRF 916	1	RH	3	7		18-Oct-13	16:30	F	No	43	53	2.8	8	18
GRF 917	1	RH	7	3		18-Oct-13	17:00	F	No	27	27	0.8	8	20
GRF 918	1	RH	3	5		18-Oct-13	16:40	F	No	33	42	1.4	9	11

GRF 919	1	RH	3	8		18-Oct-13	16:30	F	No	39	42	1.3	9	13
GRF 920	1	RH	5	6		18-Oct-13	17:00	F	No	36	41	1.7	9	14
WDL 142	4	RH	5	2		18-Oct-13	17:00	M	No	75	91	14.8	3	
GRF 924	1	RH	3	8		19-Oct-13	16:00	M	No	35	30	0.6	7	15
GRF 925	1	PP	1	5		22-Feb-14	15:45	F	No	35	43	1.4	3	8
GRF 926	1	PP	4	4		22-Feb-14	16:00	M	No	35	48	1.4	3	15
GRF 927	1	PP	3	3		22-Feb-14	15:50	M	No	36	49	1.4	3	16
GRF 928	1	PP	5	5		22-Feb-14	16:00	M	No	42	49	2.2	3	20
GRF 929	1	PP	1	1		22-Feb-14	15:45	M	No	33	41	1.2	4	6
GRF 931	1	PP	2	6		22-Feb-14	15:45	M	No	39	48	2	4	7
GRF 940	1	RH	4	3		22-Feb-14	16:40	M	No	40	43	2	7	16
GRF 942	1	RH	3	3		22-Feb-14	16:50	M	No	31	47	1.5	6	11
GRF 1025	1	RH				23-May-14	10:10	F	Yes	59	66	8.2	10	14
GRF 1026	1	PP	1	3		23-May-14	6:40	M	No	60	72	6.3	4	11
GRF 1027	1	RH	4	4		23-May-14	9:00	F	No	50	61	3.4	10	18
GRF 1028	1	RH				23-May-14	9:50	F	No	58	67	6.1	10	20
GRF 1029	1	RH				23-May-14	10:05	M	No	59	71	5.9	8	14

GRF 1030	1	RH	6	5		23-May-14	7:30	M	No	50	51	3.6	9	14
GRF 1033	1	PP	5	4		23-May-14	17:00	M	No	52	67	4.1	1	20
GRF 1034	1	PP	5	1		23-May-14	17:00	F	No	48	44	3.6	1	20
GRF 1035	1	PP	2	6		23-May-14	17:00	M	No	79	91	15.4	1	18
GRF 961	1	RH	R	3		22-Mar-14	18:00	F	No	38	46	2.1	10	13
GRF 962	1	RH	5	3		22-Mar-14	11:00	F	No	46	54	2.9	10	15
GRF 963	1	RH	1	3		22-Mar-14	11:00	M	No	41	50	1.9	9	13
GRF 964	1	RH	2	6		22-Mar-14	10:30	M	No	37	47	1.4	8	16
GRF 965	1	RH	7	3		22-Mar-14	17:20	M	No	43	54	2.4	8	17
GRF 966	1	RH	7	1		22-Mar-14	17:30	M	No	37	46	1.6	8	18
GRF 916	2	RH	3	7		22-Mar-14	17:00	F	No	45	56	3	8	18
GRF 967	1	RH	7	2		22-Mar-14	17:30	M	No	41	49	2.3	8	20
WDL 748	2	RH	R	5		22-Mar-14	17:20	M	No	73	88	13.8	5	20
WDL 235	3	RH	5	2		10-Apr-14	17:20	M	No	71	85	12.3	17	
GRF 943	1	RH	2	3		22-Feb-14	16:50	F	No	41	53	2.2	9	16
GRF 944	1	RH	4	3		22-Feb-14	16:40	F	No	39	45	1.8	9	17
GRF 945	1	RH	3	4		22-Feb-14	16:50	M	No	32	44	1.8	7	8

GRF 946	1	RH	R	2		22-Feb-14	17:00	M	No	42	40	2	7	18
GRF 947	1	RH	4	3		22-Feb-14	16:40	M	No	36	43	1.5	7	20
GRF 948	1	RH	6	1		22-Feb-14	16:30	M	No	38	43	2.1	8	11
GRF 949	1	RH	6	6		22-Feb-14	16:30	F	No	39	49	2	9	20
GRF 950	1	PP	1	3		8-Mar-14	6:30	F	No	40	48	2.2	3	16
GRF 951	1	RH	7	4		8-Mar-14	16:00	M	No	46	59	3.2	8	13
GRF 953	1	PP	5	1		22-Mar-14	16:40	F	No	49	61	3.2	3	17
GRF 954	1	PP	5	6		22-Mar-14	16:40	M	No	60	58	6.7	4	8
GRF 955	1	PP	3	3		22-Mar-14	16:40	F	No	41	53	2.5	3	18
WDL 773	1	RH				27-Apr-13	16:30	M	No	61	62	6.3	6	12
WDL 774	1	RH	3	4		27-Apr-13	18:00	M	No	40	50	1.7	6	13
WDL 775	1	RH	4	6		27-Apr-13	18:30	F	No	46	59	3.1	7	18
WDL 776	1	RH	7	5		27-Apr-13	18:00	M	No	49	30	3.8	6	14
WDL 777	1	RH				27-Apr-13	16:30	F	No	47	58	3.1	7	20
WDL 673	4	RH				27-Apr-13	13:30	M	No	79	70	16.1	4	18
WDL 807	1	RH	6	5		23-May-13	17:00	M	No	75	88	12.7	6	18
WDL 809	1	RH	6	6		23-May-13	17:00	F	No	49	60	3.1	3	7

WDL 808	1	RH	1	4		23-May-13	17:00	F	No	54	64	4.3	3	6
WDL 580	3	RH	R	4		23-May-13	17:00	F	Yes	65	73	7.8	5	11
WDL 672	2	PP	2	4		23-May-13	17:00	F	Yes	61	58	7.3	2	10
WDL 637	3	RH	7	4		23-May-13	17:00	F	Yes	61	69	6.6	5	17
WDL 363	2	RH	5	2		23-May-14	17:50	M	No	80	97	15.5	2	6
WDL 694	4	RH	7	3		23-May-14	17:15	M	No	79	90	15.2	4	20
GRF 946	2	RH	R	2		23-May-14	17:20	M	No	64	69	6.9	7	18
GRF 1039	1	RH	R	1		23-May-14	17:25	M	No	60		6.1	9	18
WDL 880	1	RH	5	5		13-Jul-13	18:30	F	Yes	59	68	6.7	8	13
WDL 881	1	RH	1	2		13-Jul-13	18:00	F	Yes	64	72	8.1	8	14
WDL 773	2	RH				13-Jul-13	15:00	M	No	71	71	10.3	6	12
WDL 882	1	RH	5	6		13-Jul-13	18:30	M	No	60	73	5.5	3	6
WDL 634	2	RH	6	3		13-Jul-13	18:00	M	No	76	96	12.9	3	20
WDL 850	1	RH	5	6		22-Jun-13	8:30	M	No	63	74	7.1	11	
WDL 851	1	RH	1	1		22-Jun-13	8:30	F	Yes	54	68	5.5	20	
WDL 852	1	RH	4	6		22-Jun-13	8:00	M	No	65	79	8	1	11
WDL 676	2	RH				4-Jun-13		M	No	67	71	10.8	4	16

WDL 810	1	PP	2	5		23-May-13	17:00	M	No	50	58	4.1	6	19
WDL 731	2	PP	2	2		23-May-13	17:00	F	No	44	53	2.4	2	14
WDL 811	1	PP	1	1		23-May-13	17:00	F	No	49	56	3	1	11
WDL 791	2	PP	1	2		23-May-13	17:00	M	No	56	67	4.5	3	7
WDL 824	1	PP	2	2		24-May-13	17:00	M	No	75	42	12.9	3	11
WDL 814	1	PP	4	2		23-May-13	17:00	M	No	51	54	3.5	3	8
WDL 815	1	PP	3	3		23-May-13	17:00	F	No	50	63	3.7	1	12
WDL 816	1	PP	3	3		23-May-13	17:00	M	No	64	80	6.4	3	9
WDL 817	1	RH	3	2		24-May-13	7:00	F	No	48	63	3.1	5	18
WDL 694	3	RH	7	3		24-May-13	18:00	M	No	58	73	6.4	4	20
WDL 825	1	RH	2	6		24-May-13	18:00	F	Yes	51	63	4.8	5	20
WDL 826	1	RH	7	2		24-May-13	18:00	F	Yes	55	65	4.9	8	11
WDL 694	2	RH	7	3		15-Dec-12	16:30	M	No	43	50	2.3	4	20
WDL 738	1	PP	2	2		11-Apr-13	7:00	M	No	44	55	2.7	2	18
WDL 739	1	RH	7	1		11-Apr-13	2:00	M	No	49	57	3.7	5	18
WDL 700	2	RH	R	1		11-Apr-13	18:45	F	No	50	60	3.9	6	20
WDL 761	1	PP	3	2		11-Apr-13	15:00	M	No	47	61	3.5	2	20

WDL 724	2	PP	4	3		11-Apr-13	18:00	M	No	57	71	5.5	2	15
WDL 747	1	RH	5	2		12-Apr-13	19:00	M	No	77	81	16.3	4	611
WDL 638	3	PP	2	3		12-Apr-13	18:00	M	No	71	91	11.8	2	8
WDL 748	1	RH	R	5		12-Apr-13	18:30	M	No	46	61	3.6	5	20
WDL 749	1	PP	4	6		12-Apr-13	18:00	F	No	42	55	2.6	2	15
WDL 750	1	RH	3	7		12-Apr-13	18:00	F	No	40	50	2	2	16
WDL 757	1	PP	1	4		13-Apr-13	18:00	F	No	44	56	2.6	2	16
WDL 758	1	PP	2	3		13-Apr-13	12:00	M	No	40	26	2.2	3	6
WDL 759	1	RH	5	2		13-Apr-13	18:00	M	No	54	74	5.1	6	4
WDL 739	2	RH	7	1		13-Apr-13	17:45	M	No	50	61	3.5	5	18
WDL 768	1	PP	3	6		26-Apr-13	18:00	M	No	44	54	2.9	6	11
WDL 769	1	RH	7	2		27-Apr-13	8:00	M	No	52	62	4.5	7	11
WDL 633	2	RH	6	1		22-Jun-13	8:30	M	No	76	65	15.1	3	18
WDL 817	2	RH	3	2		15-Jun-13	18:00	F	No	49	59	2.3	5	18
WDL 844	1	PP	2	1		15-Jun-13	17:30	M	No	52	64	3.3	11	
WDL 845	1	PP	3	3		15-Jun-13	17:30	F	No	49	60	2.4	3	7
WDL 846	1	RH	6	3		15-Jun-13	18:00	F	Yes	60	69	6.3	18	

WDL 847	1	RH	R	2		15-Jun-13	18:30	M	No	66	78	8.7	4	7
WDL 580	4	RH	R	4		22-Jun-13	18:00	F	Yes	66	75	8.2	5	11
WDL 870	1	RH	2	6		22-Jun-13	18:30	M	No	76	31	12.3	1	6
WDL 871	1	RH	5	5		22-Jun-13	18:30	F	Yes	49	34	1.9	17	
WDL 776	2	RH	7	6		22-Jun-13	18:00	M	No	69	57	8.3	6	14
WDL 393	7	PP	5	1		13-Jul-13	19:00	F	Yes	68	31	7.9	1	10
WDL 711	2	PP	3	1		13-Jul-13	19:00	M	No	64	52	7.2	2	14
WDL 640	2	RH				9-Aug-13	16:30	M	No	78	95	14.2	4	13
WDL 580	5	RH	R	4		10-Aug-13	15:30	F	Yes	64	74	7.7	5	11
WDL 899	1	PP	2	6		10-Aug-13	15:30	F	No	57	49	5.9	11	
WDL 900	1	RH	4	4		10-Aug-13	7:00	F	No	28	33	0.5	8	15
GRF 901	1	RH				24-Aug-13	11:40	M	No	70	82	10.5	6	20
GRF 902	1	RH				24-Aug-13	11:50	M	No	75	83	13.9	7	13
GRF 903	1	PP	4	5		24-Aug-13	16:30	M	No	37	47	1.5	3	14
GRF 904	1	RH	1	4		24-Aug-13	17:18	F	No	33	40	1	8	16
WDL 633	3	RH	6	1		24-Aug-13	17:00	M	No	77	19	13	3	18
GRF 905	1	RH	6	1		24-Aug-13	17:00	M	No	63	75	7.9	7	14

GRF 907	1	RH	4	5		21-Sep-13	17:00	F	No	28	35	0.8	8	17
GRF 986	1	RH	7	6		10-Apr-14	17:40	F	No	41	52	2.2	10	16
GRF 985	1	RH	6	6		10-Apr-14	17:45	M	No	72	87	12.1	2	1020
GRF 905	2	RH	6	2		10-Apr-14	17:45	M	No	70	83	12.3	7	14
WDL 616	2	RH	R	4		10-Apr-14	17:00	F	No	64	76	7.7	5	15
GRF 943	2	RH	2	3		10-Apr-14	17:30	F	No	46	60	2.9	9	16
GRF 996	1	PP	5	3		11-Apr-14	17:00	F	No	45	52	2.6	4	16
GRF 997	1	PP	4	3		11-Apr-14	17:00	M	No	71	82	13	4	16
WDL 637	4	RH	2	4		11-Apr-14	17:40	F	No	60	71	6.9	5	17
WDL 235	4	RH	5	2		12-Apr-14	8:20	M	No	70	84	12.1	17	
GRF 1003	1	PP	4	1		10-May-14	17:00	F	No	54	65	4.9	4	17
GRF 1004	1	PP	3	2		10-May-14	17:00	M	No	56	71	5.8	4	18
GRF 1010	1	RH	1	4		10-May-14	18:20	F	No	55	64	4	10	17
GRF 963	2	RH	1	3		10-May-14	18:30	M	No	50	64	3.8	9	13
GRF 986	2	RH	7	6		10-May-14	18:00	F	No	46	58	3	10	16
WDL 709	2	RH	4	6		10-May-14	18:00	M	No	79	95	16.6	5	6
GRF 1051	1	RH	7	2		24-May-14	18:00	M	No	69	85	11.3	9	20

GRF 1010	2	RH	1	4		24-May-14	18:20	F	No	55	63	4.5	10	17
GRF 1052	1	PP	5	2		24-May-14	17:45	M	No	55	67	4.7	5	10
GRF 1053	1	RH	3	1		24-May-14	18:15	M	No	48	60	3.1	5	9
GRF 1054	1	RH	7	2		24-May-14	18:00	F	No	57	70	5.6	3	11
GRF 1055	1	PP	2	4		24-May-14	17:20	M	No	78	70	14.3	4	17
GRF 1056	1	PP	5	5		24-May-14	17:50	M	No	58	64	4.6	5	6
GRF 1057	1	RH	3	6		24-May-14	7:40	M	No	63	76	6.4	10	11
GRF 1058	1	RH	2	6		24-May-14	7:30	M	No	70	87	10.4	10	13
GRF 1066	1	PP	4	4		25-May-14	17:30	F	No	51	58	3.7	4	6
GRF 1067	1	RH	R	2		26-May-14	6:40	F	No	51	62	4.8	11	16
GRF 1068	1	RH	4	2		25-May-14	18:10	M	No	74	64	12.3	10	14
GRF 1069	1	RH	7	1		25-May-14	18:30	F	No	51	62	4.1	11	17
GRF 1070	1	RH	1	1		25-May-14	7:30	F	No	57	69	5.2	11	18
GRF 1071	1	PP	3	3		25-May-14	6:40	M	No	54	71	4.3	4	13
GRF 1072	1	PP	1	3		25-May-14	17:20	M	No	67	81	8.2	5	11
WDL 207	7	PP	3	4		25-May-14	17:30	M	No	82	97	18.8	6	
WDL 580	6	RH	R	4		26-May-14	6:45	F	No	66	80	8.9	5	11

GRF 1073	1	RH	5	2		25-May-14	17:45	F	No	55	45	4.2	11	20
GRF 1097	1	RH	4	6		21-Jun-14	19:50	M	No	46	58	3	10	15
GRF 1098	1	RH	3	1		21-Jun-14	18:30	M	No	56	71	4.6	10	16
GRF 1099	1	PP	3	6		21-Jun-14	8:20	F	No	55	68	4.7	3	20
GRF 1100	1	RH	7	4		21-Jun-14	6:20	F	No	54	60	4.9	1	8
GRF 1067	2	RH	R	2		21-Jun-14	18:00	F	No	55	64	5.5	11	16
WDL 642	3	PP	2	3		21-Jun-14	6:10	F	No	64	72	7.8	2	9
GRF 964	2	RH	2	5		21-Jun-14	18:30	M	No	53	67	4.3	8	16
WDL 207	8	PP	3	4		21-Jun-14	18:20	M	No	83	96	17.5	6	
WDL 789	2	RH	3	3		21-Jun-14	18:30	M	No	50	68	3.8	6	15
GRF 1025	2	RH				21-Jun-14	9:16	F	Yes	60	70	7.4	10	14
GRF 1039	2	RH	R	1		28-Jun-14	18:00	M	No	62		7.4	9	18
GRF 1109	1	RH	7	5		28-Jun-14	6:45	J	No	51	65	5	2	811
GRF 1111	1	RH	6	6		12-Jul-14	8:40	M	No	45	29	1.6	3	16
GRF 1112	1	RH	5	6		12-Jul-14	7:50	M	No	50	51	2	3	17
GRF 1113	1	PP	5	2		12-Jul-14	7:10	M	No	45	42	1.7	3	11
GRF 1120	1	RH	7	1		12-Jul-14	8:30	M	No	60	73	6.6	10	17

GRF 1126	1	RH	5	6		19-Jul-14	7:15	M	No	65	75	8.6	10	18
GRF 1127	1	PP	4	2		19-Jul-14	6:40	J	No	56	70	6.6	4	14
GRF 1137	1	RH	3	9		19-Jul-14	18:30	F	Yes	65	61	10.8	13	16
GRF 1138	1	RH	3	4		19-Jul-14	18:20	M	No	42	57	7.1	10	20
GRF 1139	1	RH	3	7		19-Jul-14	18:30	F	Yes	65	55	4.6	13	17
GRF 1140	1	RH	5	1		19-Jul-14	18:55	F	No	56	68	6.4	13	18
WDL 851	2	RH	1	1		19-Jul-14	18:45	F	Yes	65	79	12.3	20	
GRF 1141	1	RH	7	5		19-Jul-14	18:00	M	No	58	46	6.1	11	16
WDL 187	2	RH	R	1		19-Jul-14	18:00	F	Yes	66	63	9.1	16	
WDL 711	3	PP	3	1		19-Jul-14	18:05	M	No	77	62	14	2	14
GRF 1142	1	PP	3	1		19-Jul-14	18:05	F	No	56	42	6.7	4	7
GRF 1164	1	PP	1	4		21-Sep-14	16:15	F	No	60	38	5.2	4	8
GRF 1166	1	PP	3	4		21-Sep-14	16:30	J	No	37	45	1.6	4	15
GRF 1171	1	RH	5	2		21-Sep-14	17:00	F	No	60	43	9.5	13	20
GRF 1172	1	RH	7	1		21-Sep-14	8:00	J	No	32	41	1.2	14	16
GRF 1120	2	RH	7	1		21-Sep-14	19:00	M	No	64	81	14.2	10	17
GRF 1173	1	RH	7	2		21-Sep-14	19:00	J	No	32	39	2.6	14	17

GRF 1174	1	RH	6	1		21-Sep-14	18:30	F	No	61	62	8.4	14	18
GRF 1175	1	RH	5	6		21-Sep-14	17:00	M	No	76	92	19.5	11	17
GRF 1183	1	PP	1	6		27-Sep-14	17:20	J	No	32	41	1.1	4	20
GRF 1184	1	RH	R	4		27-Sep-14	15:20	J	No	32	41	1.1	15	16
GRF 1185	1	PP	1	3		27-Sep-14	17:20	M	No	26	32	0.5	5	13
GRF 1186	1	RH	5	5		27-Sep-14	18:15	J	No	23	27	0.4	14	20
WDL 777	2	RH				27-Sep-14	13:30	F	No	65	70	9.6	7	20
GRF 1187	1	PP	3	4		27-Sep-14	17:20	M	No	32	37	1.1	5	14
GRF 1188	1	RH	5	1		27-Sep-14	18:15	M	No	30	40	1	11	18
GRF 1189	1	PP	5	6		27-Sep-14	17:20	F	No	63	74	9.3	4	18
GRF 1174	2	RH	6	1		27-Sep-14	18:05	F	No	62	61	8.1	14	18
GRF 1190	1	PP	2	3		27-Sep-14	17:30	M	No	70	65	13.4	5	15
GRF 1191	1	RH	4	6		27-Sep-14	17:50	F	No	66	82	12.1	15	17
GRF 1184	2	RH	R	4		4-Oct-14	18:05	J	No	35	42	1.3	15	16
GRF 1200	1	PP	1	3		4-Oct-14	17:30	J	No	34	39	1.3	5	16
GRF 1201	1	PP	5	1		4-Oct-14	17:30	M	No	47	53	3	5	17
GRF 1202	1	PP	5	2		4-Oct-14	7:00	J	No	29	24	0.8	5	18

GRF 1203	1	RH	4	2		4-Oct-14	18:20	M	No	70	64	13.2	11	20
GRF 1230	1	RH	3	9		18-Oct-14	17:30	M	No	78	92	17.1	13	17
GRF 1231	1	PP	1	5		18-Oct-14	16:50	J	No	25	31	0.5	5	20
GRF 1232	1	PP	1	6		18-Oct-14	16:50	M	No	45	60	3.2	6	13
GRF 1233	1	RH	4	5		18-Oct-14	17:35	F	No	30	37	1	15	20
GRF 1234	1	RH	7	1		18-Oct-14	17:35	F	No	40	47	2	1	
GRF 1235	1	RH	5	3		18-Oct-14	16:30	M	No	49	60	3.5	13	18
GRF 1187	2	PP	3	4		7-Nov-14	15:10	M	No	44	61	3.2	5	14
GRF 1238	1	PP	1	1		7-Nov-14	15:15	M	No	36	40	1.7	6	14
GRF 1239	1	PP	5	1		7-Nov-14	15:05	J	No	26	29	0.6	6	15
GRF 1240	1	RH	6	3		7-Nov-14	15:35	J	No	28	35	0.8	1	611
GRF 1218	1	RH	7	6		18-Oct-14	7:30	M	No	33	37	1.1	13	16
GRF 1219	1	RH	7	2		18-Oct-14	7:30	F	No	62	70	9.8	15	18
GRF 1243	1	PP	3	3		8-Nov-14	16:25	M	No	43	55	3.1	6	16
GRF 1244	1	PP	4	6		8-Nov-14	16:30	J	No	36	43	1.9	6	17
GRF 1247	1	RH	7	3		8-Nov-14	15:30	M	No	34	40	1.4	7	17
GRF 1248	1	RH	7	2		8-Nov-14	15:30	M	No	38	45	1.8	15	18

VITA

Gabriela R. Franco was born May 21, 1993 in El Paso, Texas to be raised by grandparents Antonio and Mary, and parents Maria and Francisco. Gabby graduated from Mission Early College High School in 2011 with a distinguished achievement diploma and by taking dual credit courses she achieved a Bachelor of Science in Biology from The University of Texas at El Paso in 2013. A year before graduating, she began field research focusing on her two passions: herpetology and ecology, through the Undergraduate Research Mentoring program at UTEP under the mentorship of Dr. Jerry D. Johnson at the Indio Mountains Research Station (IMRS) where she continued her education after graduation by pursuing a Master of Science. Gabby plans to pursue a career that allows her to educate the public about herpetology, ecology, and conservation.

Gabby is a member of the Southwestern Association of Naturalists and the Society for the Advancement of Chicanos and Native Americans in Science.

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This thesis was typed by Gabriela R. Franco.