

Motuora island reptile monitoring report for common & Pacific gecko 2016

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Summary

Monitoring of common & Pacific gecko was undertaken in March 2016 over four days & three nights. Only one life stage (juvenile) of common geckos was found, and two life stages of Pacific's (adults & juveniles). In terms of the indicators of translocation success, this year's results have provided the following information -

1. Founder survival - Pacific gecko adult founders are present and previous years surveys have proved survival of common gecko founders.
2. Evidence of breeding and survival of offspring to adulthood - the presence of juveniles provided evidence of breeding for both species, although without the ability to permanently mark individuals it is unclear whether adult commons are founders or island born. It is too soon to determine whether Pacific gecko offspring are surviving.
3. Increase in population size - the population size of each species is unknown, and no surveys to date have found more individuals than were released.
4. Range expansion into suitable habitat - range expansion has occurred at the common gecko site but has not been tested at the Pacific site.

Method

All detection devices were checked for occupants four times between 25th and 28th March 2016. At the common gecko site, occupancy checks were completed either before the sun had heated covers (to avoid the covers becoming too hot) or after the sun had gone from the site. The Pacific gecko site which is under tree canopy was checked mid-morning to early afternoon before temperatures become too hot.

At least two people lifted/opened artificial covers to increase the likelihood of capture. Tracking tunnels were baited with banana and cards checked daily.

Results

Common gecko

Monitoring of ACOs resulted in sighting of 33 geckos, of which 31 were captured. Captures comprised 21 individuals (16 juveniles & 5 sub adults) with ten of the juveniles being recaptured over subsequent days. The two geckos that escaped capture were juveniles and likely to be unique individuals bringing the total of individuals to 23 (18 juveniles & 5 sub adults). No adults were

captured. Six Duvaucels geckos were also captured under ACOs at the common site - four juveniles and two sub-adults.

Snout to vent lengths (SVL) ranged from 27-35mm for juveniles, and 41-46mm for sub adults Figure 1). Weights ranged from 0.75-1.75g for juveniles, and 1.75-2.75g for sub adults (Figure 2). All 16 juveniles had entire tails and one had a scar on its belly. Four of the five sub adults had entire tails and the one with a regrown tail also had a scar on its belly.

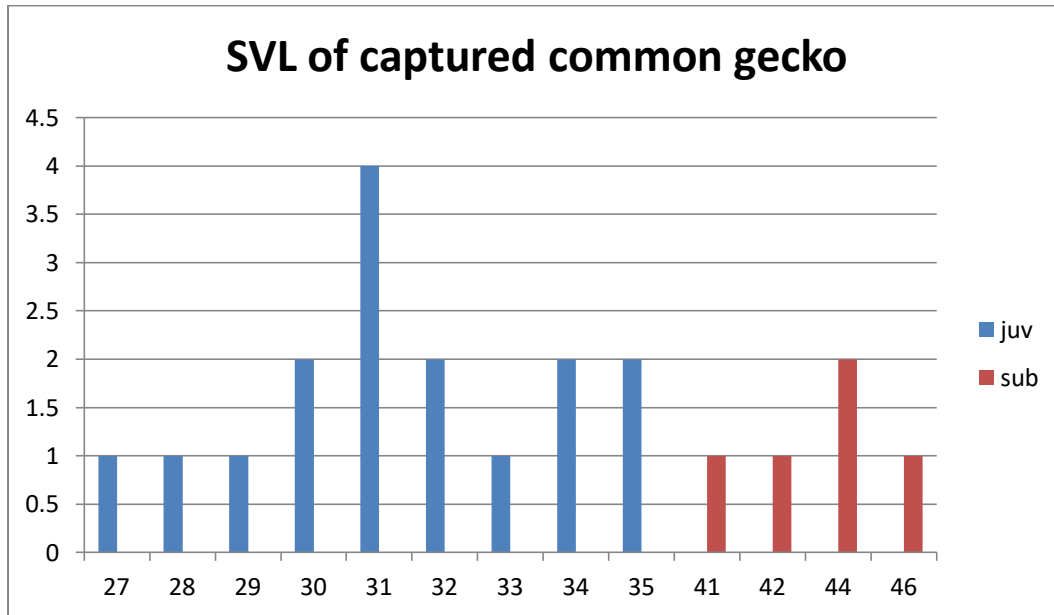


Figure 1: Snout to vent lengths of captured common gecko

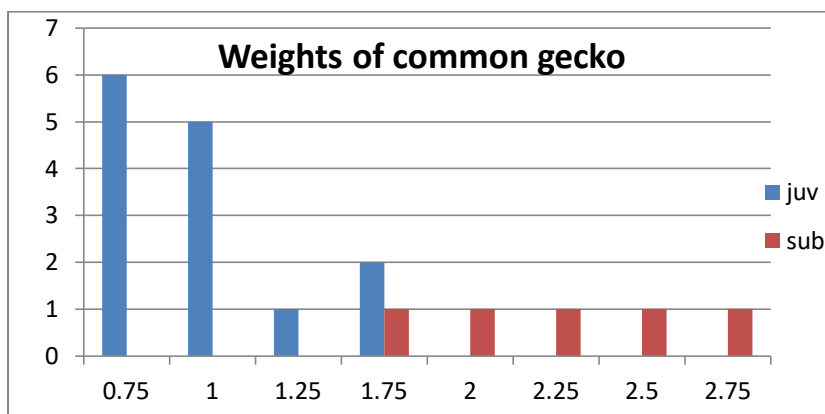


Figure 2: Weights of captured common gecko

The percentage of covers occupied was 75 % (9 out of 12). The number of common geckos found under each occupied cover on any one day ranged from one to four. Duvaucel geckos also occupied the ACOs and were captured. Six individuals were identified (4 juveniles & 2 sub adults). Duvaucel and common geckos were not found under covers together on the same day but common geckos

did reoccupy covers that Duvaucels had been found in on previous days. Over the four days of cover checks, two covers (A10 and A12) were occupied every day (Figure 3).

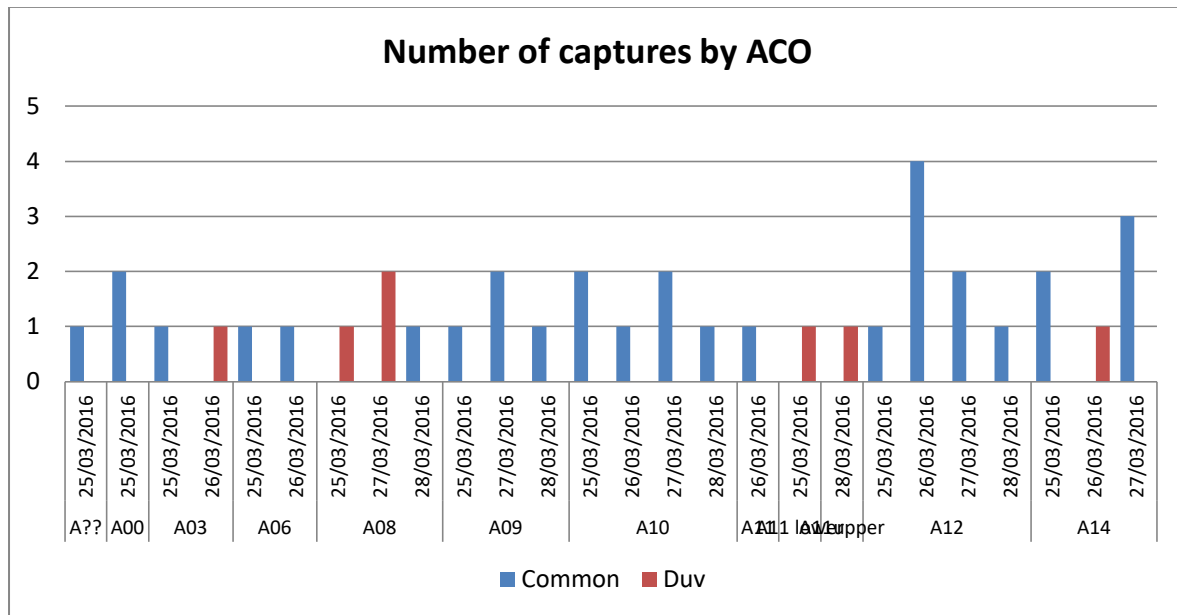


Figure 3: Cover occupancy

Tracking tunnels

Results were identical between 2015 & 2016. Duvaucel geckos were dominant at the site, tracking in 16 of the 20 tunnels (80%) on the same night. Skinks tracked in 10 (50%) tunnels and common geckos only in 2 (10%) tunnels.

Pacific gecko

Monitoring of ACOs resulted in sightings of 16 geckos of which 15 were captured. Captures comprised 10 individuals (7 adults & 3 juveniles) with one adult and one juvenile being recaptured once over subsequent days, and one juvenile recaptured three times. The one gecko that escaped capture was an adult and likely to be a unique individual bringing the total of individuals to 11 (8 adults & 3 juveniles). Nine copper skinks were also captured under ACOs at the site - including one juvenile.

Snout to vent lengths (SVL) ranged from 37 - 41mm (average 39.6mm) for juveniles; from 56 - 61mm (average 58.5mm) for females; and from 59 - 82mm (average 71.75mm) for males (Figure 4).

Weights ranged from 1.5 - 1.75g (average 1.67g) for juvenile;, 4.75 - 5.25g (average 5g) for females; and 5 - 14.75g (average 9.6g) for males (Figure 5). All individuals except one male had entire tails.

One male had a toe missing, while the other males had silver markings that may have been scars.

38% of adults had mites, mostly around the eyes or ears.

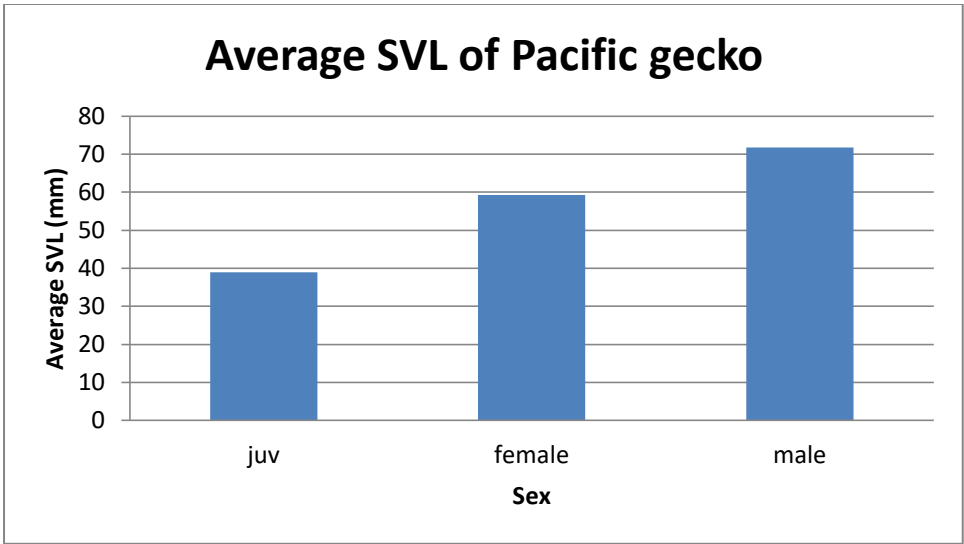


Figure 4: Snout to vent lengths of captured Pacific gecko

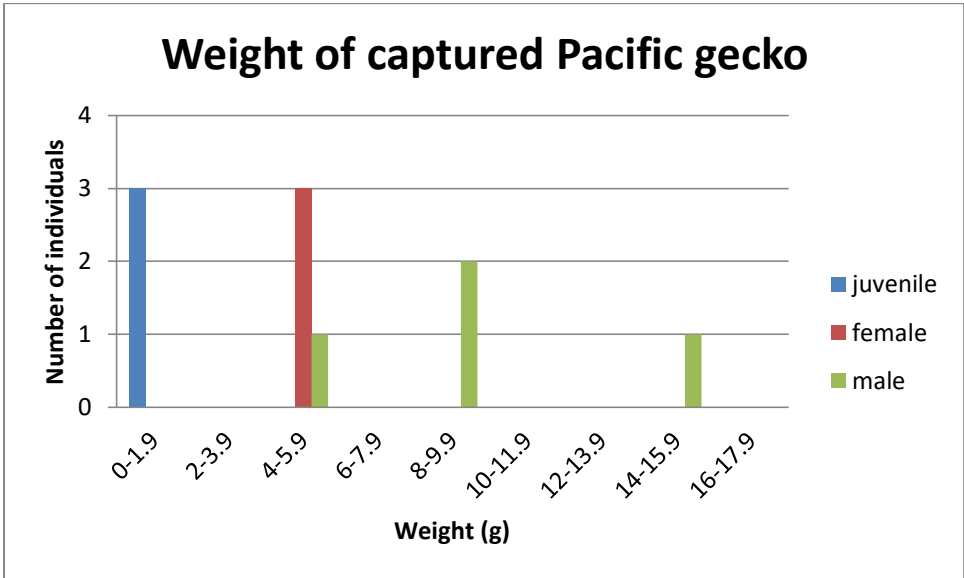


Figure 5: Weight of captured Pacific gecko

Tracking tunnels

No pacific gecko prints were found in tunnels. Skink prints were found in one of the 15 tunnels (7%).

Night spotting

The release area was surveyed by spot lighting one night, and no geckos were found.

Discussion.

Common gecko

Despite concerns that the presence of Duvaucel gecko could exclude common gecko from the site, it appears this is not the case. Although common geckos did not share occupancy of covers with Duvaucels, they did both occupy the same covers on subsequent days, indicating they both come and go from the covers regularly. However, no adult common geckos occupied the covers this year and it is unclear whether this is due to the presence of Duvaucels. The presence of juveniles indicates that adults must be present in close proximity, and adult footprints were found on tracking cards. Given that adult females can bear a maximum of two young per pregnancy, the presence of 16 juveniles indicates that a minimum of 8 females must be present at the site.

In 2015, some tracking tunnels were moved and placed approximately 5-15m above the original release site to ascertain if the population is expanding its range. Common gecko footprints were found in the expanded tracking grid confirming range expansion.

Pacific geckos

The presence of four adult males indicates that at least 31% of the original 13 released individuals have survived at the site, compared to only 11% (3 out of 27 released) of females. It is highly likely however that only a sample of adults were captured or else have dispersed away from the covers into surrounding habitat. The juveniles/sub adults present may have been released as juveniles (n=8) in 2014, so as yet there is no proof of breeding success.

Due to the ability of a gecko to drop its tail in order to escape predation, the entirety of tails can be a proxy for avoidance of encounters with predators. Similarly, the presence of scars can be an indicator of competitive interaction with other individuals of the same or different lizard species. In this case, the ratio of individuals with entire tails (90%) suggests low predator interaction, while those with visible scars (42%, all males) was quite high especially when considering males only (3/4 75%), suggesting that competition within the species is occurring, even at such low population density.

Detection devices have not been expanded beyond the release site so there is no proof of range expansion.

Comparison to previous years

Common geckos

The number of individuals present under ACOs varied greatly between years. A number of factors can influence presence such as temperature, previous disturbance, occupation by other species, dispersal and availability of natural refuges. Unfortunately without a wider intensive monitoring grid, not all of these factors can be teased apart or proven. The declining rate of adult captures may be due to dispersal and use of natural refuges but may equally be due to disturbance or high temperatures. Despite only two individuals being captured in 2015, 21 individuals were captured in 2016 proving that the presence of Duvaucels had not excluded commons from the site. Factors that

had changed between 2015 and 2016 were the later sampling time in 2016 of March with cooler temperatures (average 22.9°C), compared to hotter temperatures in January of 2015 (average 24.1°C). It appears that when the temperature of ACOs is too high, they are not likely to be occupied. During peak holiday time when many campers are present on the island, disturbance of covers is likely and in 2015, the resident ranger frequently checked ACOs close to the beach. In 2016, one ACO was moved to prevent disturbance from the public but as most of the ACOs are visible from the beach, further interference is possible.

Pacific geckos

Comparisons between years is not possible yet, as different age classes have been caught each year. Individuals were found using trees during night spotting so it is possible that the geckos have expanded their range vertically. With no detection of neonates, it isn't possible to determine if the population has bred successfully. However, some individuals have survived and established and it is recommended that the monitoring devices along the track edge where no geckos have been detected to date, be moved further down slope to large trees if possible. As it is only two years since the Pacific geckos were released, it is too soon to determine whether an increase in population has occurred.

Conclusion

The programme criteria for determining a successful introduction are -

1. Survival of founders
2. Proof of breeding
3. Population increase
4. Range expansion

When applied to common gecko, there is proof of all criteria except population increase. This does not mean that there hasn't been an increase, rather, that as yet it hasn't been detected by the monitoring programme. Any monitoring programme sampling only a small portion of available habitat can only achieve a sub-sample of the population. Combined with the difficulty of detecting lizards due to their cryptic nature, their slow breeding rate, and likely dispersal from the release site, it is unlikely that a population increase will be detected for another five or so years. At this stage, it appears that the release of common gecko has been moderately successful.

When applied to Pacific gecko, there is only proof of survival of some founders. However, it is too soon to expect proof of the other criteria, especially when so few individuals have been caught, and when the density is low compared to habitat availability.