

Motuora island reptile monitoring report for common & Pacific gecko 2017

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Summary

Monitoring of Pacific gecko was undertaken in March 2017 over five days & four nights while volunteers were on the island assisting with Duvaucel gecko monitoring. The survey was undertaken by Su Sinclair, Miranda Bennett & Shaun Bennett with assistance from Manu Barry, Eva Fernandez, Sam King and Vivienne Glenday.

Although it was not necessary to monitor the common geckos in 2017, the release site was sampled as part of the Duvaucel survey. Common geckos were captured but no morphometric data was taken. Two life stages (adults & juveniles) of common geckos were present, and two life stages of Pacific's (adults & sub-adults). 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 or sub-adults provided evidence of breeding for both species, although without the ability to permanently mark individuals it is unclear whether adult common geckos are founders or island born. It is too soon to determine whether Pacific gecko island born offspring are surviving to adulthood.
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

Detection devices at both sites were checked for occupants four times between 13th and 18th March 2016. The Pacific site was checked in the afternoons, after Duvaucel monitoring was completed. The common gecko site was checked in the mornings while looking for Duvaucel gecko. Temperatures at the common site were not recorded.

At least two people lifted/opened artificial covers to increase the likelihood of capture. Tracking tunnels were baited with banana and cards checked daily. Detection devices checked at the common site were comprised of 12 ACOs (ground covers). Detection devices checked at the Pacific site were comprised of 22 ACOs (ground covers), 22 CFRs (tree covers) and 15 tracking tunnels.

Results

Common gecko

Monitoring of ACOs resulted in sighting of 61 geckos, of which 59 were captured. Captures comprised at least 29 individuals (17 juveniles 12 adults) with many individuals being recaptured over subsequent days. Of the adults captured, at least seven were females and five were males. Two juvenile Duvaucel geckos were also captured under one ACO.

No morphometric measurements were taken.

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 five. Duvaucel and common geckos were found under covers together on the same day. Over the four days of cover checks, six covers (A02, A04, A06, A10, A11 and A12) were occupied every day (Figure 1).

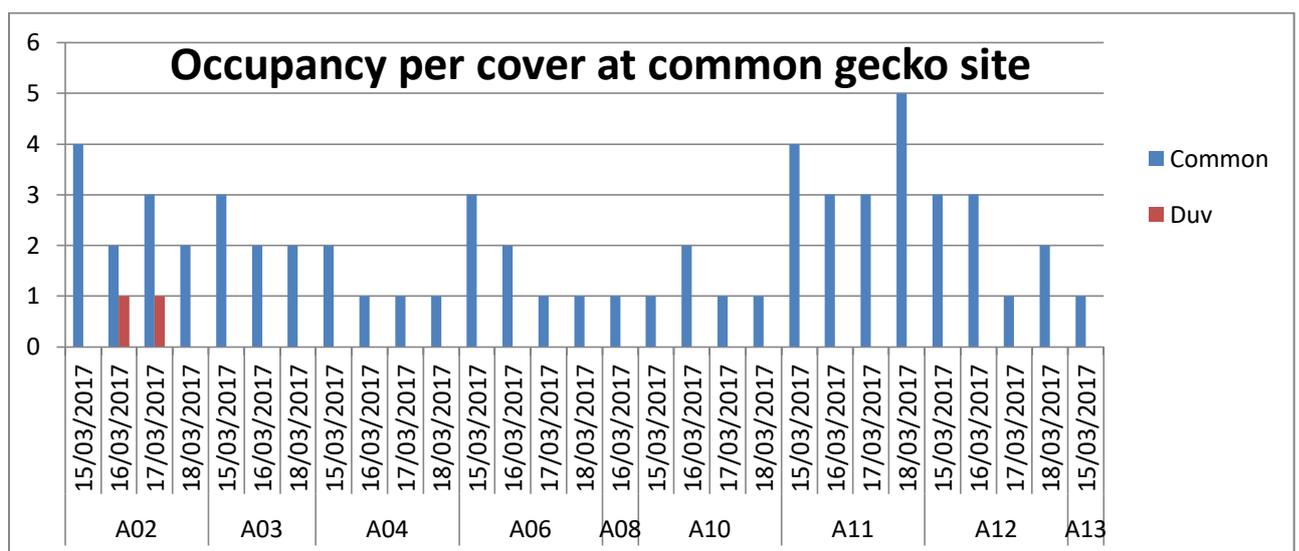


Figure 1: numbers and species of gecko found under ACOs

Pacific gecko

Monitoring of ACOs resulted in sightings of 17 geckos of which 15 were captured. Captures comprised 12 individuals (10 adults & 2 sub-adults) with one sub-adult and two adults being recaptured once over subsequent days. Of the 10 adults, six were males and four were females. Thirteen copper skinks were also captured under ACOs at the site - likely to comprise 10 individuals including four juveniles.

Three individuals (one sub-adult, one female and one male) were found during one night spotting check. None of the geckos were marked so were assumed to be new individuals. Two of the geckos were present on old tree stumps near the top edge of the release area. Temperatures during sampling ranged between 21-23°C.

Total individuals caught comprised 12 adults (5 females & 7 males) and three sub-adults. Snout to vent lengths (SVL) ranged from 57-58mm for sub-adults (average 57.7mm); from 61-86mm (average 76.6mm) for females; and from 61-86mm (average 73.1mm) for males (Figure 2). Weights ranged

from 5 - 5.25g (average 5.1g) for sub-adults; 8-16g (average 11.6g) for females; and 5.4-15.5g (average 11.1g) for males (Figure 3). Eleven individuals had entire tails. Two females had scars and one female was missing a claw from one toe. Two males had claws missing, while one also had scars. 50% of adults had mites, mostly around the eyes or ears.

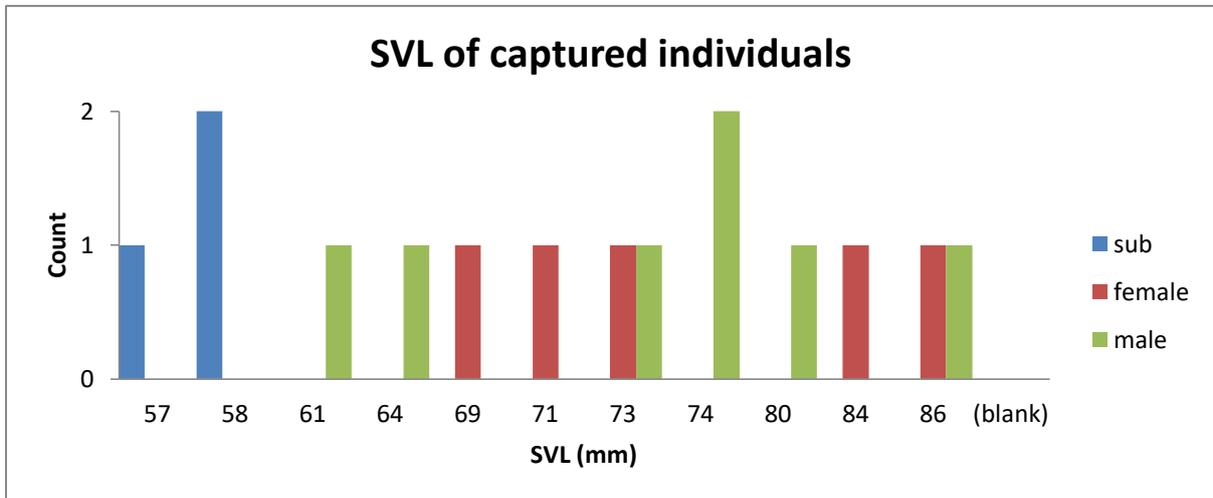


Figure 2: Snout to vent lengths of captured Pacific gecko

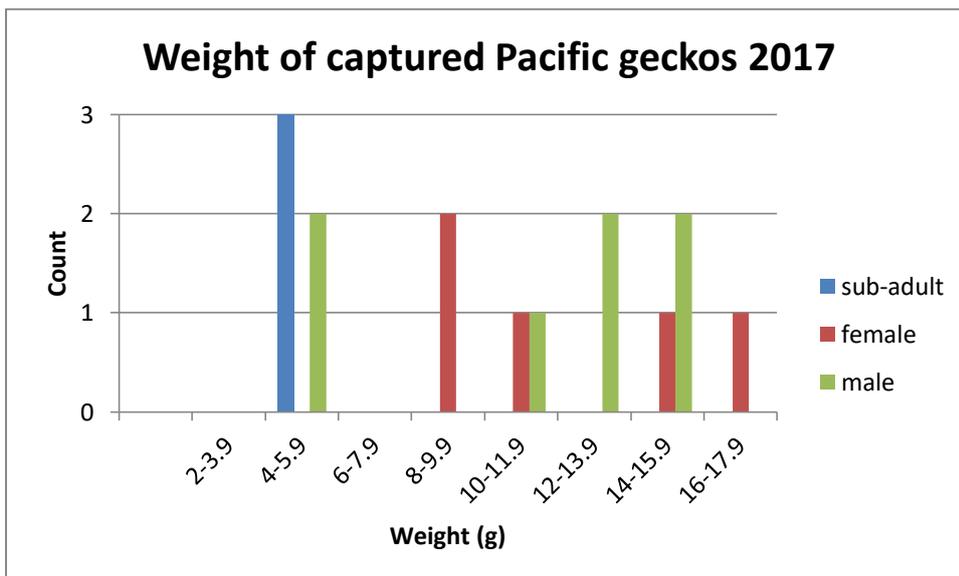


Figure 3: Weights of captured Pacific gecko

The percentage of covers occupied was 25 % (11 out of 44) with only one gecko found under each occupied cover on any one day. 23% (5/22) of ground covers were occupied compared to 27% (6/22) of tree covers. Of the 12 individuals captured, 58% were found under tree covers and 42% under

ground covers. Copper skinks were only found under the same covers as Pacific geckos on one day. Over the four days of cover checks, tree cover (P18CFR) was occupied on three days (Figure 4).

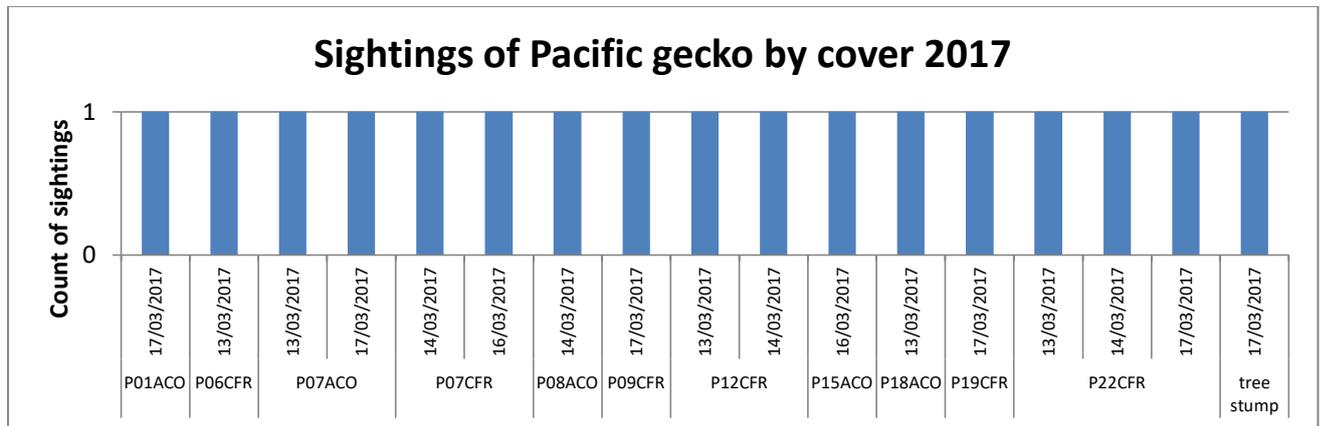


Figure 4: Cover occupation

Five new tree covers (CFRs) were established to ascertain if the population has expanded - three on large coral trees above the camp ground some distance below the release site, and two on trees just below the release site. Steepness of terrain made placing more tree covers below the release site impractical.

Tracking tunnels

No pacific gecko prints were found in tunnels. Skink prints were found in 2 of the 15 tunnels (13%).

Identification images

Images taken this season have enabled comparison with founders to establish how many of the adults captured are original founders. Two males (including one captured at night) and two females were matched with founder images implying that the other eight adults captured may not be founders but are instead island born. Comparisons of founder morphometrics show that one male is a similar weight, while the other male has gained 1.43g. As the females were both gravid at time of release, comparison of weights for them is not possible.

Discussion.

Common gecko

The presence of adult and juvenile common geckos as well as Duvaucel geckos under covers indicates they these species are co-habiting at the site. However, the impact of Duvaucel geckos on the common gecko population cannot yet be determined. The presence of 16 juveniles indicates that at least eight females are present, although only seven were captured.

Pacific geckos

Evidence of individuals surviving to adulthood (as implied by founder image matching) is a good indication that food resources are sufficient to sustain the founder population and fulfils one of the measurements of translocation success. Due to the time taken for Pacific geckos to mature, it is assumed that these individuals were either born on the island from gravid female founders or released as juveniles. As no juveniles were detected and the sub adults present were very close to adult size, there is as yet no proof of post release breeding success. It is assumed that the proportion of individuals captured through monitoring represents only a sub-sample of the entire population, and it is highly likely that adults have dispersed away from the covers into surrounding habitat.

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 (83%) suggests low predator interaction, and those with visible scars (25%) suggests that some competition within the species is occurring, even at such a low population density.

As yet there is no proof of range expansion as the one individual found at the top edge of the site was very close to an original tree stump release site.

Comparison to previous years

Common geckos

The number of individuals detected has increased by 52% between 2016 and 2017 (Figure 5). The presence of similar numbers of juveniles between 2016 & 2017 indicates a similar number of breeding females are present at the site (Figure 6), and that it is the detection of these individuals that changes.

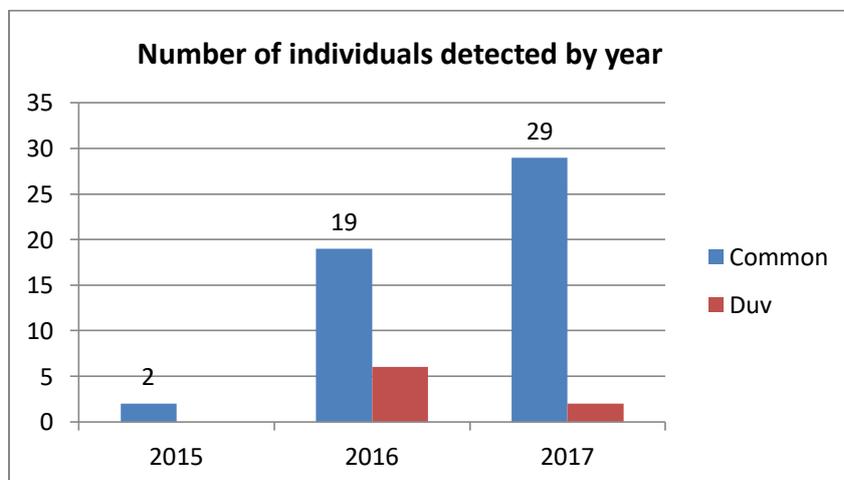


Figure 5: Number of detection per year

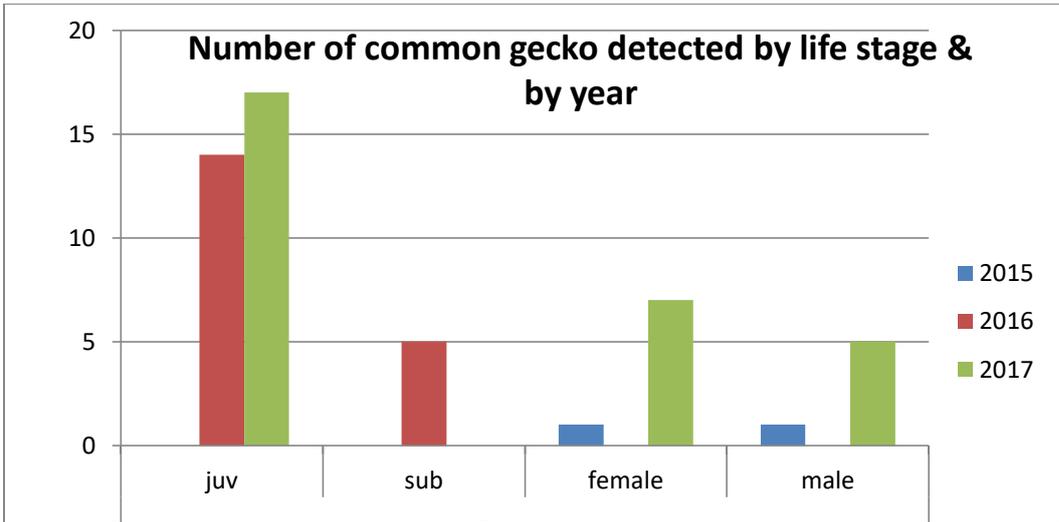


Figure 6: Detection by life stage per year

The sites were sampled at a similar time of year, but the maximum temperature during checks was 3°C lower in 2017 compared to 2016 (23°C c.f 26°C) possibly indicating that at lower ambient temperatures, cover occupancy is higher. In 2017, two ACOs were moved to prevent disturbance from the public. A string fence and sign are now present asking the public not to disturb the area.

Pacific geckos

An 1400% increase in detection of has occurred since 2015, with a 36% increase between 2016 and 2017 (Figure 7).

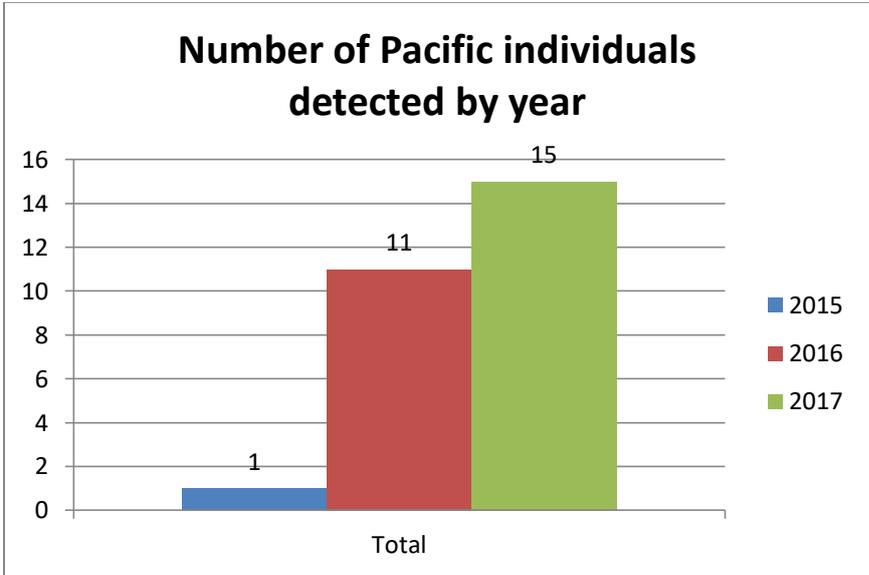


Figure 7: Detections per year Pacific gecko

More life stages have been detected since 2015, and numbers of adults detected have increased between 2016 and 2017 (Figure 8).

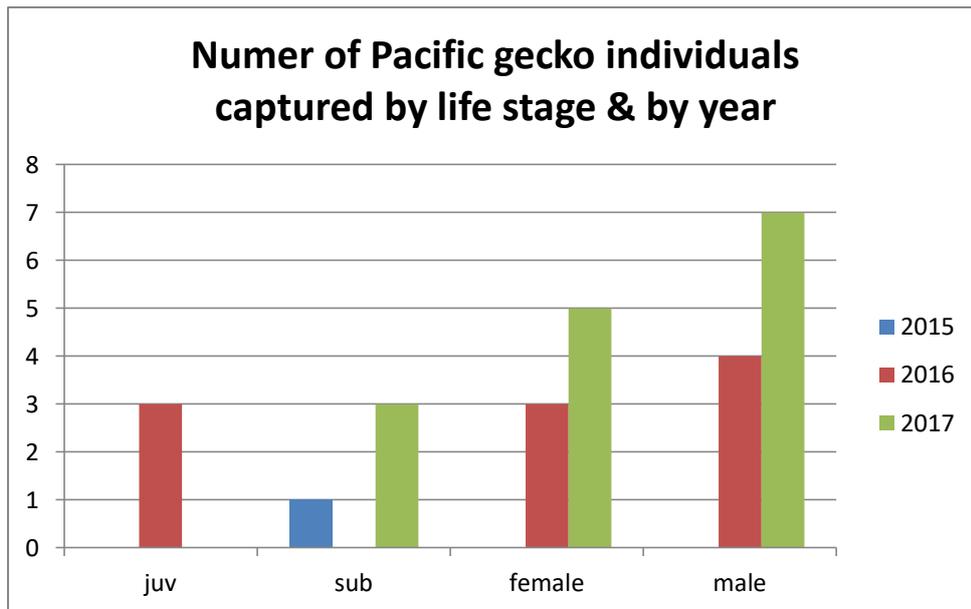


Figure 8: Detections by life stage and year Pacific gecko

An increase in detection rates between years may not necessarily be relative to population size. One factor that appears to influence detection is ambient temperature. In 2015 the covers were sampled in January when the average ambient temperature at the site was 25.3°C, as opposed to 2016 and 2017 when the sampling was undertaken in March with average temperatures of 23.7°C and 22.2°C (Figure 9). It appears that as temperatures have decreased, detection has increased.

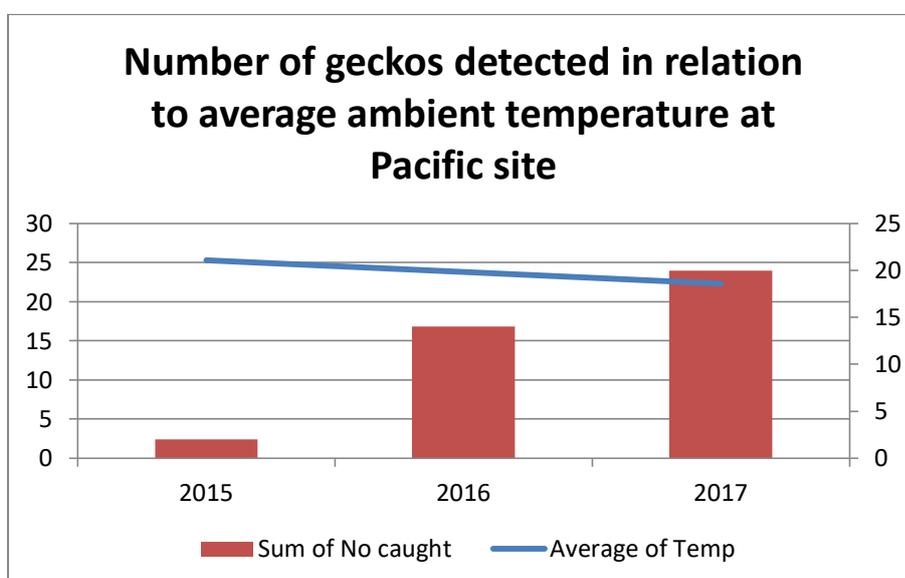


Figure 9: Captures per year related to ambient temperature

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, 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, including survival to adulthood of juveniles. As it has only been a relatively short time since their release (3 years) it is unlikely that detection of population increase or range is feasible.