“High Plains Vetting ..... Helping the Endangered Guthega Skink”

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One of the many reasons I wanted to be a veterinarian was the thought of doing a boring desk job was just impossible to comprehend! While some would argue that talking about fleas, vaccinations and anal glands every day is the veterinary equivalent of an office job there is a lot to be said about doing something that you love. The most enjoyable part of my job is working with reptiles and amphibians on a daily basis. I get to see, handle and treat some of the most amazing animals on the planet and not a day goes by where I am not in awe of the diversity and complexity that reptiles and amphibians possess. My work has allowed me to travel to some pretty wonderful places and meet many passionate people. It also tends to open some interesting doors to some new and exciting opportunities.

In late 2014 I was approached by Latrobe University to assist with some reptiles they had on campus for research purposes including Saltwater Crocodiles (Crocodylus porosus), a colony of Jacky Lizards (Amphibolurus muricatus) and a number of Veiled Chameleons (Chamaeleo calyptatus). If getting to play with chameleons wasn’t good enough I was asked shortly afterwards if I would be interested in helping researchers on some field work with the Guthega Skink (Liopholis guthega). Naturally I jumped at the chance to get out of the practice and into the wide open spaces.

The specific taxonomic identification of the Guthega Skink has changed several times over the years with the increased use of molecular techniques. They were initially included in with the similar looking White’s Skink (Egernia whitii) and eventually they were described as a new species, Egenia guthega. In 2010 their generic name was changed to the currently accepted Liopholis guthega.

The Guthega Skink is a medium-sized skink species with a snout-to-vent length of 11cms. They are only found at elevations of 1600 metres or above in the Australian Alps. This makes them one of the highest occurring lizard species in Australia, and they live in one of the coldest regions of the country.

They live colonially in a warren system. These warrens often have multiple entrances and can spread out over several metres. Mating occurs in late spring or early summer with females giving birth to one or two live young in February to March. During June to October these communal warrens are generally covered with a thick layer of snow and the lizards probably seek refuge in the deeper parts of the warren for the winter. The warrens are constructed in rocky areas on the flat plains or low alpine hills with the openings often under boulders or shrubs.

Because of their restricted high elevation distribution and probable susceptibility to some threatening processes, this species is listed as threatened in Victoria and nationally, and susceptible to a number of potential threats.

These threats include:

- Loss and degradation of habitat

Historically there have been two causes of habitat destruction for the Guthega Skink. These have been:

i. Construction

It just so happens that right in the middle of the skink's known range are some of Australia's largest ski fields, including Fall's Creek! Construction of

resort roads has modified and fragmented the skink's habitat.

ii. Grazing

Until January 2015 cattle were allowed to graze throughout the Alpine National Park. This farming practice caused trampling of the skink's habitat, and while domestic cattle have been removed from the Park there are still feral cattle, horses and pigs present.

- Predation

Foxes and feral cats are a potential threat to the Guthega Skink survival.

- Bushfire

Large bushfires are occurring with increasing frequency in the Alpine National Park with fires in 2003 and 2007 affecting the species' range in Victoria. Fire has the ability to greatly change the environment with respect to vegetation and food availabiliy.

- Climate change

The impact of climate change on the Guthega Skink is yet to be fully understood but theoretically it could be devastating. With less snow comes shorter cooling periods which may affect breeding as well as allowing greater numbers and variety of predators to reach areas where they would not normally be able to get to.

As part of the efforts to ensure the Guthega Skinks' survival a captive husbandry program is being developed at Healesville Sanctuary. The Guthega Skink has been listed as one of Zoos Victoria's 20 Priority Species and fits well under the organisation's "Fighting Extinction" banner. Part of the challenge of housing, maintaining and breeding these active little lizards is the fact that during the cold, snowy winters they remain dormant in their warrens. In order to replicate these natural conditions in captivity at lower elevations, researchers needed to determine what body temperature the skinks descend to during this time.

But how do you obtain this temperature data? Simple… surgically implant specially designed data collecting "microchips" called data loggers in the body cavity of captured lizards and then release

them back into the wild for the winter before recapturing them and removing the loggers for analysis in the spring! Sounds simple doesn't it?

In early January 2015 I made the 5-hour drive from Melbourne up to the ski resort and spectacular scenery of Falls Creek where I was met by lead researcher, Zak Atkins. Over lunch he filled me in on his latest findings and gave me a great overview of the project. Zak had already caught ten Guthega Skinks of a mixture of males and females of assorted ages, and reproductive states from several locations over the alpine plains area in preparation of my visit.

These were housed in pairs in large heated plastic tubs in the University's apartment at the ski resort. I set up my anaesthetic and surgical equipment on the kitchen table and we started. Each lizard was weighed, sexed and identified via its previously implanted microchip before being anaesthetised using an agent called isoflurane administered via a small face mask. The skinks took only a few minutes to reach a surgical plane of anaesthesia before they were gently placed on their backs and their abdomens aseptically prepared. A small amount of local anaesthesia was infiltrated around the site of the incision and allowed to take effect. A small incision was made in the left rear area of the abdomen and an opening into the body cavity was created. Each data logger measured approximately 15mm long and 6mm wide. The loggers were soaked in disinfectant before being gently inserted into a lizard. With a quick couple of stitches in the abdominal muscles using a dissolvable suture and some tissue glue on the skin and we were finished. One down and nine to go! The skinks woke up very quickly and were back in their enclosures 10-15 minutes later. 1-hour post-surgery and they were aggressively hunting down meal worms that we flicked towards them. On the first day we implanted five of the skinks before calling it a night and getting some sleep.

The next morning we finished off the remaining five lizards before jumping into the 4WD and heading out into the national park to see if we could catch some more Guthega Skinks. We did not have to wait long as Zak spotted likely habitat Sure enough there were plenty of openings to small warrens scattered around the site each covered with some overhanging vegetation. Sitting in the opening of many of the warrens was a Guthega Skink. As we approached they would scuttle into the burrow.

We spent a few hours catching skinks and checking on their health. It was pleasing to find many pregnant females and young animals. They were all in excellent condition and appeared to be getting plenty of food. In addition to Guthega Skinks we also found Tussock Skinks (Pseudomoia pagenstecheri) in abundance

. Unfortunately, the Highland Copperhead Snakes (Austrelaps ramsayi) proved elusive!

The scenery of the area is simply breath taking. Large open grasslands give way to rocky outcrops and areas of trees, many just dead trunks of silvery timber. The area is also dotted with large lakes of crystal clear water. It is not surprising that many people regard this area as the most stunning landscape in all of Australia… and we have plenty of landscapes! It was not a bad "office" for a couple of days. After a successful couple of days implanting lizards I headed home. The following day Zak released the implanted lizards back to their respective warrens to prepare for the coming winter though he did catch a few of the skinks a few weeks later to check on them. Those he caught had all healed well, not lost any weight and seemed to be doing well.

The winter of 2015 came and went. Skiers took advantage of the bumper ski season totally oblivious to the fact that under the snow and ice they were sliding across was an entire population of endangered mountain-dwelling lizards. With spring the snow began to melt and it was time to see what the data loggers had recorded.

On the first weekend of December I once again made the long journey to the mountains. Arriving just after lunch we were straight into it. Zak had caught five of the previously implanted skinks and he was happy to report that they all looked in great condition and the previously pregnant females had given birth. Once again we set up our surgical facilities on the kitchen table and had the first lizard anaesthetised in a matter of minutes. Zak was like an expectant father! He was pacing around and could hardly contain his nerves as the data logger was removed from the first lizard. Had they worked? Had they collected the information he needed? Would the special equipment needed to read the data on the chip function? After a few tense minutes due to some software glitches the data started to come through. To see the relief of Zak's face was priceless. The last three years of studying these incredible little skinks had come down to this moment and it was very rewarding to be part of the process.

Four of the data loggers had stayed in the exactly the same position in the abdominal cavity as I had placed them. They were easily felt when the lizards were palpated and as such were very simple to retrieve. The entire process of anaesthesia, retrieval, closure of the wound and recovery from the anaesthetic for each skink was 10-15 minutes. In the fifth lizard the data logger had herniated out of the abdominal cavity and become trapped under the skin. This had not seemed to affect the lizard in any way and it too was quickly anaesthetised and the device removed before closing the hernia and skin incision.

The data collected from these five lizards is still to be analysed and the results will be published in an upcoming scientific journal. It is hoped data will significantly assist the management of the species. I would like to acknowledge:

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