

thylacinus

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Cover photo: Standing tall.
Credit: Kevin Fallon

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FROM THE PRESIDENT Mike Drinkwater

Dear members, how do you zoo?

It's hard to imagine we are already on the brink of launching into the 2019 Annual Conference! With the theme of 'How Do You Zoo? Keeping Conservation Collaborative', we are aiming to bring together professional animal carers and zoological affiliates from right across our region in a bid to strengthen relationships and enhance our understanding of what is required to work collaboratively towards a better future for species and habitat. This is always one of the pinnacle events of the year and we look forward to sharing our experiences and learnings in future issues, with those who are unable to attend.

2019 has certainly kicked off with a hive of activity. Most importantly, we have been able to implement a brand new, refreshed website after experiencing a few challenges under the previous model. We trust that the user experience is greatly improved. Moving forward, the committee will continue to fine tune function and content and strive to maintain a steady flow of information and opportunity for the zoo fraternity.

We received an extraordinary response to our major fundraising initiative; Bowling for Tree Roo Rescue and Conservation Centre. We know of up to 25 separate events that were held right throughout the region. We also sold a record number of t-shirts (approx. 580) which is an amazing outcome! We are starting to see the money rolling in and will be tallying up the results very shortly. Congratulations to keepers everywhere for pulling together to help out this amazing organisation!

We were also impressed, to say the least, with the stunning entrants to this year's Wildlife Photography Competition. We have been busy sorting through all of the submissions and look forward to announcing the finalists very shortly, which will be on display at the annual conference where delegates will vote for the overall winner.

Finally, this year is an election year where a new committee will be voted in to steer the ASZK over the next two years. I would like to extend my thanks to the current committee who have worked together over the past couple of years. Liz Romer, Jocelyn Hockley, Chris Dryburgh, Steve Dalleywater, Brit Hides, Vikki Quinn, Karen James, Melvin Nathan, Caroline Monro and Richard Roswell, thank you for your contributions and assistance.

Keep on keeping collaboratively, Mike

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Sustainability & Innovation at the Invertebrate Department at Melbourne Zoo

Melvin Nathan - mnathan@zoo.org

KEEPER – REPTILES, INVERTEBRATES & EDUCATION AT MELBOURNE ZOO

The Melbourne Zoo’s Invertebrate Department has many climate-controlled glasshouses. These glasshouses are home to butterflies, mantids, Giant Burrowing Cockroaches, beetles and stick insects, especially the Lord Howe Island Stick Insect (LHISI). Melbourne Zoo is Australia’s oldest zoo at 156 years old, the Butterfly House is much younger at 32 years old. However, infrastructure at 32 years old exposed to 24-7 high heat and humidity does take its toll. Being a fragile building, like many ageing structures within the zoo grounds, its risky business to upgrade the infrastructure. However, with advancements in technology it proved that we could upgrade our facilities and reduce cost of the upkeep.

Melbourne Zoo’s Invertebrate Department approached these ongoing improvements to their facilities from a financially sustainable angle. As a result, it opened doors to advanced technology and cost-efficient practices with long term benefits, not to mention the amazing advances in animal husbandry.

Butterfly House

The roof glass panels of the Butterfly House have been replaced with double paned glass (Veridian) to improve insulation. Furthermore, automated roof screens, with reflective shade cloth; Svensson 50% Shade (diffuses light not block it), were installed to help regulate the amount of light that enters the house, which therefore also helps regulate the temperature within the house to keep it between 20°C to 30°C. There are light sensors on the roof trigger that the automation. We have programmed the middle section to be more light sensitive and provide shade if needed, to keep our Tree Ferns from getting burnt by the sun.

We also have replaced all our Mercury vapor lights in the Butterfly House with LED day spectrum grow lights (Canon Pro LED 120W 5000 Kelvin).

Lord Howe Island Stick Insect Glasshouses

Using advanced agriculture science and technology, our modern glasshouses have double paned Perspex walls, underfloor hydronic heating, inbuilt hot steam humidifiers, compact evaporative coolers, automatic roof vents and roof screens. All this replicates the climate on Lord Howe Island within these glasshouses for our phasmids.



Climate controlled glasshouses creates the ideal environment for our LHISI to thrive



Butterfly House roof with double paned glass, showing the open and close positions of the shade cloths



Underfloor hydronic heating coils before concrete was poured over the slab

All this hardware is controlled by the Priva software, which can be accessed from our office computer. Due to the sensitive nature of invertebrate micro climates, it was important to install failsafe's in case of malfunctions; therefore, text alarm systems to notify keepers of power failures, temperature or humidity spikes were installed. Thus, keepers have remote access to Priva at home as well, all functions and readings can be controlled and monitored remotely. Furthermore, there is also a portable industrial generator nearby to act as a life support system should there be a power failure.

Our generator will be upgraded to have solar panels to keep the batteries charged and mounted onto a trailer to make it portable.

The glasshouses are also covered in reflective shade cloth and have misters atop to help keep them from overheating in the summer.



Inbuilt hot steam humidifiers, Condair CP3 Mini



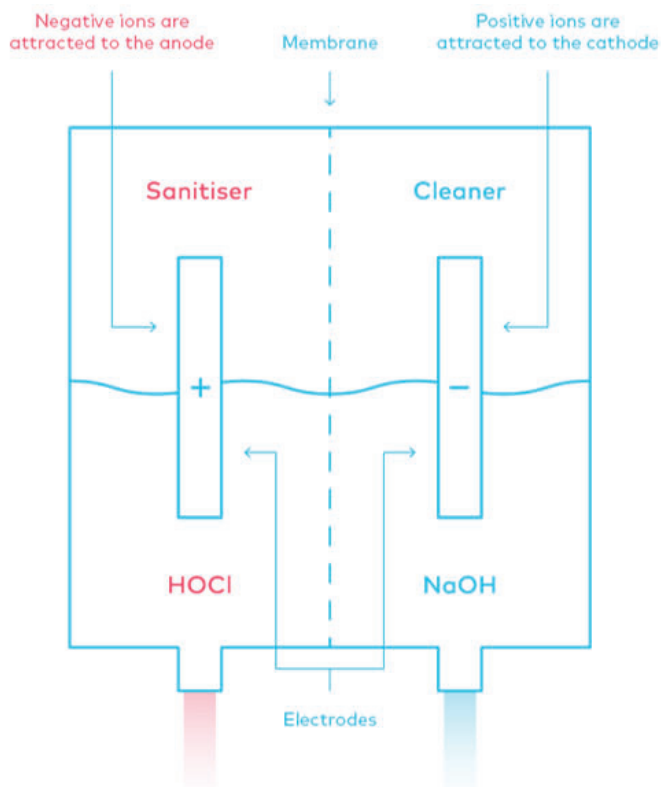
The LHISI glasshouses reflective shade cloth (Svensson 80% Shade)

E-Water

Cleaning at the department has recently reached a new level of sustainability with the use of E-Water. This product uses electrolysed water to generate powerful cleaning agents that rivals sterilants such as Sodium Hypochlorite and F10. This product removes the use of plastic chemical bottles or containers as it is made from a wall unit. The best thing about this sustainable cleaning method is that; it's environmentally friendly and there is no need for any sort of PPE (gloves, masks, goggles & boots), another cost greatly reduced!!! The



recommended contact time for sterilisation is only about 30 seconds to a minute. Furthermore E-Water, can also prolong the life of cut browse.



E-Water Sanitiser is produced when a positive current is run through salt water which makes an acidic solution. E-Water Cleaner is produced when a negative current is run through salt water which makes an alkaline solution.

We ran a test at our department to see if this product is as good as seems. We used three of our dirties surfaces for the test: our Caterpillar box base (stainless steel) & Dish (plastic) on which the plant pots sit, which has faeces on it and the base of our Butterfly emerging boxes (stainless steel) where the butterflies secrete meconium upon emerging. After each treatment of sterilization on the 3 surfaces we took a swab sample to be then sent off for pathology, 15 swabs all up. Results below.

	Butterfly Meconium (stainless steel)		Caterpillar Box (stainless steel)		Dish (plastic)	
	Sanitizing	Cleaning	Sanitizing	Cleaning	Sanitizing	Cleaning
	Coliform Grade	Aerobic Grade	Coliform Grade	Aerobic Grade	Coliform Grade	Aerobic Grade
1. Dirty	4	6	7	7	7	7
2. Hot Water	0	0	1	0	5	6
3. E water 3 mins	0	1	0	0	3	4
4. E water 30 mins	0	0	0	0	0	1
5. Milton 30 mins	0	1	0	0	0	0

- The Coliform Grade is a measure of sanitizing, the highest acceptable grade for Coliforms is 1
- The Aerobic grade is a measure of cleanliness, the highest acceptable grade for Total Aerobic is 4

From this we concluded that, for stainless steel surfaces; Milton, Hot Water and E-Water all have the same effectiveness of sanitization no matter the time exposed to the cleaning product. On the Plastic surface however, it showed that only when exposed to Milton & E-Water for 30 minutes it proved to be an effective mode of sanitization. From these results we then moved forward with plans to start using E-Water for all our cleaning needs.

Bio Degradable Gloves

It was brought to our attention that a lot disposable rubber gloves take about 100 years to start breaking down. With this in mind, we started to seek out alternatives which lead us to discover SHOWA 6110PF gloves, which start to break down within 1-5 years. Naturally we made the switch...



Future Endeavours

Some of the other cool things we have the privilege of being part of is testing out prototypes of sustainable and innovative advancements in technology. Zoos Victoria teamed up with CSIRO and the Lord Mayor's Charitable Foundation to test out the new Solar Film. (see right and below right).

This flexible lightweight film can potentially be mounted onto almost anything imaginable that needs power. It has the potential to even effectively absorb enough power from a shaded area, thus why it is set up under our current roof to the Lord Howe Island Stick Insect area.

I would like to thank the amazing team I work with who come up with all the ideas. Especially Kate Pearce, Rohan Cleave, Sarah Silcocks and Jessie Sinclair. Also, a very supportive manager and mentor, Jon Birkett. We are happy to share our knowledge and information on any of our sustainable and innovative practices.

Reference:

K. Yoshida et al., Sterilization Effect and Influence on Food Surface by Acidic Ewater Treatment. Nippon Shokuhin Kagaku Kougaku Kaishi. 827-834. 2001 (in Japanese with English abstract)



Our strategies towards a strong Koala population

TARYN MOORE – AUSTRALIAN REPTILE PARK

Koalas are one of our most unique and iconic species in Australia and are one of the most sought after visitor experiences in the country and because of this there is a high value placed on individuals and institutions are understandably protective of their koalas. They are vulnerable to stress related illness, as well as disease. On top of this the population in Australia are quite related, new wild founders are few and far between. Lastly it should be recognised that due to disease, and differing management strategies many institutions have experienced population decline within their koalas in recent years, leaving many wildlife parks with few or no Koalas at all.

At ARP we have a long history of keeping koalas, and strong genetic lines. Also we are a growing institution with an increasing demand on Koalas interactions. However in 2008 we recognised a problem where we acquired a new koala from another institution and unknowingly let retrovirus into our collect. It is something that the Reptile Park had never experience before, so it became obvious that there was a problem.

Even with ongoing research there is still little known about retrovirus, however it is believed to cause a development in immunosuppressive diseases and cancers. Retrovirus can be both endogenous meaning it can be

genetically transferred to offspring and exogenous which is adult to adult transfer. By being genetically transferred this poses a huge threat for populations both in the wild and in captivity. It is already believed that most if not all wild koalas in QLD and NSW have retrovirus. This graph here is of a study completed on 264 koalas at 16 different institutions throughout Australia. It shows the percentage of different diseases within the captive population with Lymphoma cancer being most prevalent at 40%. Along with these diseases there is a higher incidence of joey death due to a lowered immune system.

Once we knew our population was infected the next step was to identify where the issues were, so we could begin to rectify them. This was done by good old fashioned zookeeping.

We noticed that koalas with retrovirus died before the age of five, that they would lose joeys and that it did appear to follow their genetic heritage. So we tracked back through all of our records. We found out who had died, at what age and the cause of death and we began to notice distinct patterns. Once this was established it was clear that there were particular ‘lines’ that was affected by disease and we made the decision not to breed with these animals to ensure retrovirus was not transferred any further into our population. This was difficult in the short term but longer term it has not only save our collection, but seen it grow from strength to strength.

To ensure anything like this did not happen again we had to develop very strict criteria when looking at obtaining any new koalas. Part of these guidelines require extensive history relating to health, breeding success, joey death and genetic lines. If any suspicions were to arise in regards to any of this then we do not trade.

Some examples of this include:

1. We don't acquire any animals that have unknown or cancer related deaths in family tree at young ages
2. We don't acquire any females that have lost joeys without known causes

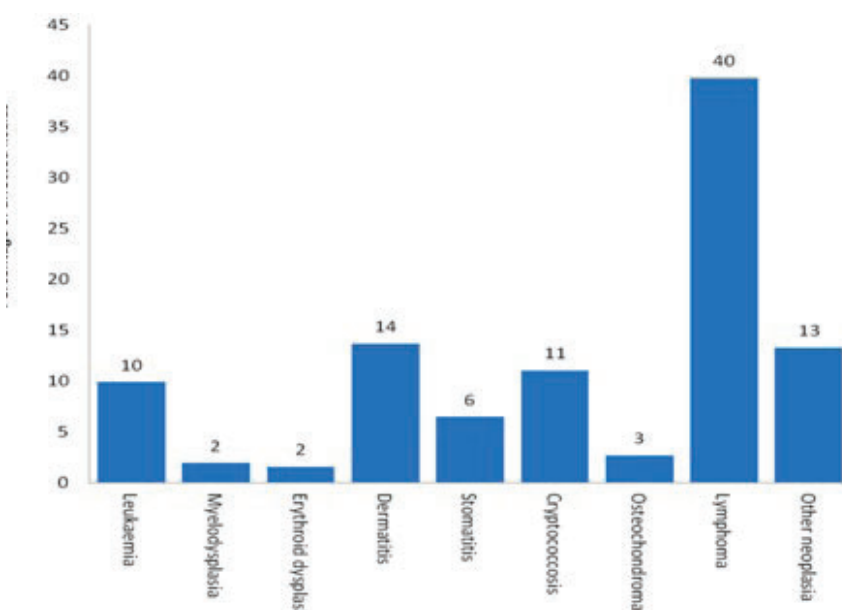


Fig. 1 Disease affecting 264 koalas at 16 different institutions in Australia

3. We thoroughly and proactively investigate the family tree of each koala we consider to acquire

Our strategy involved using one stud male to breed with all of our females for two years then acquiring a new male. This has worked so far and enabled us to get our numbers back up from five however this method is not very sustainable in the long term. Having one male breed with all females essentially creates a next generation that is related, and limits our own facilities ability for breeding in future years. Additionally, if there is ever a diseased animal that enters the population, there is risk that all Koalas will then be at risk as they have all been maintained together. In addition to this, we needed to consider the possibility of not being able to access new founder males every two years. What if we needed to manage our population just with the animals we have now, and how long would this work for. You can see by just having one stud male all the future joeys are then related by the sire. This causes difficulty with population management and decreases our genetic diversity within our population and the population in captivity as a whole.

We had some basic training in small population management, and revised our strategies on how we are going to move forward in our koala management

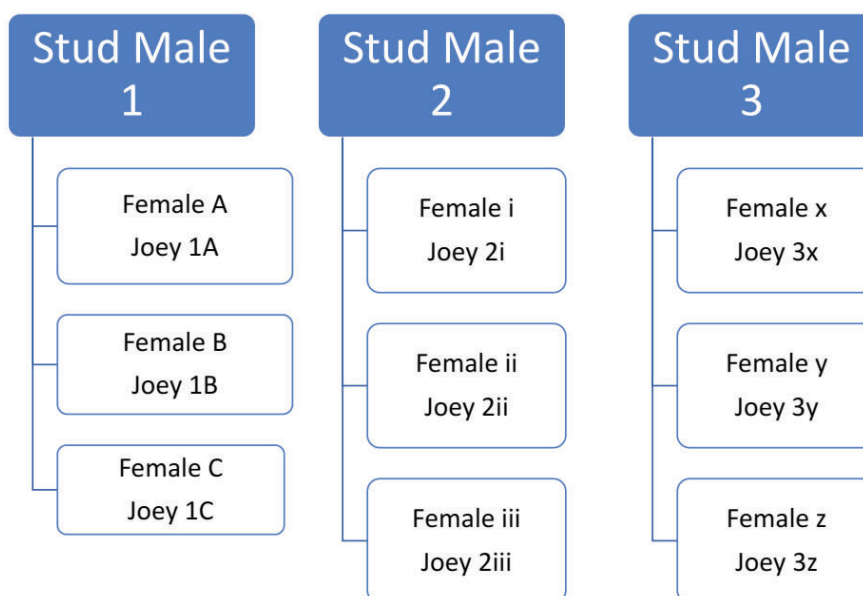
We now work by three principles:

- To have strict criteria for incoming animals to protect against disease risk
- Continue to keep female genetic lines separate
- To have a clear management tool for in house breeding where we can extend the genetic value of each line for long term sustainability

We already have three distinct female genetic lines and to keep this as pure and genetically valuable as possible we have recently introduced two new founder males to our collection giving us three distinct harem group which are unrelated to each other with a potential for a fourth

Our successful management has mostly be done by 'gut instinct' and this has worked for a small population.

However as our population is growing rapidly and koalas are increasingly difficult to acquire we now have a clear process, and plan to follow to ensure the long term sustainability of our population. This is the first year of our three harem groups and is already showing to be a huge success with 10 confirmed joeys in pouch and a few more females not checked which brings our total up to 30 koalas. Our aim is to continue to increase this into the future and focus on improving our husbandry and welfare conditions to be on track for another successful breeding season.



In this system there are three genetic lines managed separately with both males and females. Of note is that there are then 3 unrelated lines of joeys emerging that can at a later date be paired if needed, or in an ideal sense, remain separate with new founders being acquired.





Triple Treat – Red Panda Triplet Weaning

Elizabeth Stickler

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This paper is about three Red Panda cubs born at Symbio Wildlife Park on Christmas Eve 2016 which made the year of 2017 a very special, memorable and somewhat challenging year. The boys' names are Phinju, Mohan and Raja.

Red Pandas will most commonly give birth to one or two cubs. There have only been eight occurrences, including this, of triplets born in Australasia over the past 30 years, and after Symbio holding Red Pandas for almost 10 years, in our first breeding attempt we were lucky enough to have the third ever litter of Red Panda triplets born in Australia.

After having to research the issues we found with the boys I found very little in the literature about supplementary feeding and possible hand rearing of Red Pandas in the region, so after the experience and wealth of knowledge

we received during the process, I thought it was important to share this information that may assist others in the future.

Our female Red Panda Kesari, was imported from Auckland Zoo to take part in a breeding program with our Male Red Panda Pabu in which we had previously acquired from Adelaide Zoo. But there were a few concerns surrounding whether Kesari would be able to successfully bear cubs without any complications. Prior to her acquisition, Kesari had recovered from a right femoral neck fracture, which is a fracture to the top of the thigh bone, very close to the hip joint. Kesari sustained this injury after falling from a tree. It was also discovered at this time that Kesari had mild metabolic bone disease.

We did have reservations about importing a female Red Panda for breeding, considering her medical

history, though after almost 12 months of recovery and rehabilitation, Kesari received full health clearance for transfer and breeding.

Pabu and Kesari were introduced in June 2016, and although both young, hit it off quite quickly and it wasn't long before we started to observe breeding signs from both parties. The breeding season naturally falls between the end of June to early September in the Southern Hemisphere, and on August 6th 2016, we started to observe our first signs of courtship.

The oestrus period in female Red Pandas is quite short, where it is believed they will be in a peak of oestrus for only 12-36 hours. After working so closely with Red Pandas over the past few years, I have discovered them to be polyoestrous, being able to hit this short peak, multiple times over about a three week period, once a year.

The male Panda has a special organ on the bottom of his tongue, which can pick up on scents left by the female and determine when she is ready to mate. As Pandas are solitary animals they only tend to show brief social interactions during non-breeding seasons, but as oestrus approaches, an increase in social interaction can be observed.

Signs of oestrus and courtship in Red Pandas can be rather subtle and include; the male following the activity patterns of the female, licking her and sniffing her flank and ano-genital region. Increased scent marking from both the male and female - the female will scent mark and walk around with her tail in an arched position to easily expose her genitals. Other signs can include high pitched vocalisations, resting in close proximity in the trees, and mutual grooming.

And on August 7th we were lucky enough to observe the pair copulating. Copulation is naturally taken place on the ground. Pabu appeared to not exactly be sure of what he was doing, trying to line himself up appropriately for quite some time. Mounting and breeding behaviours continued throughout the day.

The following morning, Pabu was observed still trying to mount Kesari and grooming her head / ears. Though by 5pm the pair were separated and observed sleeping in separate areas of the trees.

Excitingly Kesari started to show us a few tell-tale signs to show us she had been successful impregnated, including resting in lower areas of the trees, nest building, protruding mammary glands and a big round belly. After a gestation of approximately 138 days, our very heavily



Red Panda copulation

pregnant Kesari did not emerge from her nest box to greet us on Christmas eve, which led us to believe she had gone into labour. Kesari was not observed to leave the nest for the following four days, which can be expected in first time mothers, and she was observed on camera out of her nest box for short periods of time at nights almost five days following birth

Red Pandas cubs are known to have a high mortality rate due to the mother being exposed to stress or disturbance of any kind. Signs of stress may include carrying the cubs around by the back of the neck trying to find a more secure location, or possibly neglect. Due to this, we had a very strict hands-off policy for the first eight weeks until the cubs had past that critical stage. Unfortunately, we were not in a position to have CCTV in the nest boxes, so we were left in the dark in the early stages as to what was going on, and cameras were set up on the exterior of the exhibit fence line to catch any movements made by Kesari. We prayed all had gone well and Kesari and her new babies were doing okay.

Our keepers did not have any visual sight of Kesari during the day for the first 13 days following birth, only catching glimpses of her emerging from the nest at night on cameras. She was very attentive and protective which was great to see but made it difficult for us to confirm the she and any potential cubs were OK.

The first very exciting sighting of one of our cubs was caught on camera on January 6th when she emerged with a cub in her mouth, softly grooming before taking it back to the nest. We now knew that we had at least one healthy cub.





Thirteen day old Red Panda Triplets

Thirteen days postpartum, Kesari was observed out of the nest at 7pm and this was our first opportunity take advantage and commence the first nest box check. Being a first-time mum, the keepers were incredibly careful in the process and Kesari had no visual access to the nest at this time. We carefully lifted the nest box lid to the biggest surprise we could have asked for; Triplets!!!

Their fur was a few shades of grey and brown, and the trio were curled up tightly together. We could see them softly breathing, eyes tightly closed. But as exciting as it was to have not one, not two but three healthy cubs, then came the concerns –

1. Will Kesari be able to successfully rear three cubs without intervention?
2. We now held seven Pandas – how were we going to house seven Pandas when the triplets matured?!

Kesari was closely observed over the following weeks and the nest boxes were checked at any safe chance. The days were continuously hot, with multiple days over 40 degrees - the hottest summer recorded in Sydney in 159 years and the temperature of the nests were reaching into the 30's on the hottest days so external misters were used to try and cool down the nesting areas and the keepers took the chance to try and let fresh air into the boxes as much as possible by softly opening the lids whilst Kesari was away from the nest feeding.

By mid-February, the cubs were beginning to hold their own weight, attempting to crawl around the nest box and showing us some of their cheeky personality, grunting and spitting at us like little piglets when we would open the

nest box. A lot of attitude in such a small animal.

But there was a clear runt within the triplets, who would eventually be named Raja. In the photo in 'Figure 8' it can be seen the clear size difference between the boys, Mohan being the largest and Raja being the smallest.



Showing the size difference between the cubs

At eight weeks of age we began our first handling sessions. We had Kesari conditioned to feeding on the ground, out of sight of the nest box. We would have a keeper stay with her and vocalise to us how she was going, if she began to move back up the trees then they would let us know and we would vacate before she would see us near the cubs.

We used complete coveralls to stop any scents being left on the cubs, we disinfected our hands and then over the top used the soap we use for washup as this is a familiar smell to Kesari. We did not want to use gloves as the latex smell is unfamiliar to her.

After a week and a half of successful handling, we began our first weighing of the cubs began in March with the cubs weighing in at between 400-500g at 9.5 weeks. Mohan was the largest weighing at 490g, Phinju close behind him at 480g but then little Raja had only just hit 412g.



First cub weighing

In Red Panda literature, at this age a cub should be expected to weigh around 1kg, and in comparing weights to litters from four other institutions we were in discussions with, our cubs were roughly 100g smaller.

Kesari was a petite Red Panda herself, naturally weighing under 4kg and we were concerned about her milk supply, particularly now as we knew the cubs were growing at a slower rate than what had been previously recorded at other institutions.

The decision was then made to begin supplement feeding, not only to help the cubs to put on weight quicker, but to also help assist Kesari as her weight and appetite for her normal feed had dropped quite significantly after birth and she was refusing her feed and would not accept any forms of protein to boost her milk supply.

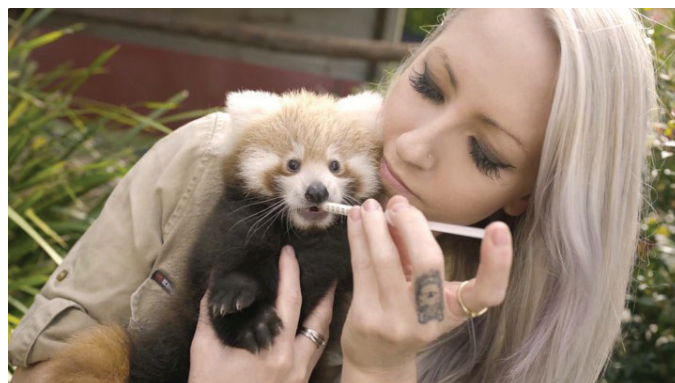
The decision to supplement feed did not come easily – there were a number of factors to consider; Potential for mis mothering – Kesari was a first-time mother and naturally protective. There was the potential for her to reject the cubs following intervention. Also, the cubs may reject Kesari's milk after commencing supplement feeds which may lead to mastitis or other complications, and of course the potential for gastrointestinal upsets with the cubs taking an artificial formula.

There was no information readily accessible on supplement feeding Red Pandas, and to our knowledge we did not know of any institution in the country which had done so.

Hamilton Zoo came to our rescue as they have previously had a litter of triplets and assisted us in the process. In addition to this, we were able to gather information from Taronga Zoo who were currently hand rearing a female cub Maiya at the time – so with information gathered from Taronga and Hamilton, we were able to make a supplementation plan of our own.

Two formulas were proposed as used by other institutions – Divetelact and a puppy formula Esiblac. We decided on Divetelact which has previously been used to hand rear Red Pandas in the region, and we were also familiar with it and had successfully used it on other animals in the park. We decided the method of feeding would be via syringe starting with 1ml. The decision to use a syringe instead of a teat and bottle was made as we did not want to confuse the cubs when going from an artificial teat and then back to Kesari's teat. Our aim was to supplement feed to assist Kesari and minimise the chances of ending up hand rearing if the cubs were to reject Kesari's teat. Milk inhalation leading to aspiration pneumonia is also a

high risk with pandas as they have a very strong suckling reflex, so using a small syringe we were able to control the amount of milk being fed and let them lap it up slowly.



Syringe supplement feeding

All supplement feeding was complete with Kesari away from the nest with no visual access, and thankfully she had no reaction to our intervention.

Keeping the cubs still whilst feeding became quite a challenge; Raja being the smallest and most eager for additional milk was generally quite calm and lapped up all his milk, whereas the larger boys took some days to readily accept the formula feeds. After trialling feeding both outside the nest and within, the cubs preferred being fed within the safety of the nest.

As the cubs became more comfortable with the feeding, we slowly increased the amount by 1ml each feed, each day to minimise the risk of any gastrointestinal upsets, with Raja being fed the most as he was the smallest. After seven days of successful supplement feeding AM and PM, we then added a third feed at Midday. They were all doing fantastic and were quickly gaining weight.

By the beginning of March, the cubs were all vet checked, microchipped and vaccinated and we were informed we had three boys. As we had three of the same sex and this was our first litter, we did have to get advice from industry peers to help us identify the sexes. Boy oh boy!! Housing four males in one exhibit was going to be a challenge in the future, once the cubs hit sexually maturity at 18 months of age, so we started to put some plans in place for constructing additional off display housing to utilise in the event we needed to separate the boys.

As the boys were getting bigger they became more and more active and were now starting to trust the keepers and even running up to us for their supplement feeds. Weighing had become a challenge, keeping the cubs still in the box was almost impossible, as they would climb out





Weighing became a challenge as they became more active

almost instantly, so supplement feeding was then done with each one in the weight box as this kept them still for long enough to get a weight.

As the boys grew and the amount of formula increased, the next decision was to then transition from syringe feeding to lap feeding from a small bowl. This was initially done in the nest.

As the cubs became more active out of the nest, gathering their attention to come down for supplement feeds became more challenging. We introduced a bell at feeding time, and they were conditioned to station on a feeding platform when the bell was rung. (See picture page 9) They absolutely loved their milk and would come running, knocking things out of the way and even leaping at me when I was preparing the feed.

We watched them grow and learn how to be Red Pandas, even copying their father's latrine behaviour, toileting in the kitty litter boxes provided. They were often observed running around on the ground with Kesari, tumbling and pouncing. Mohan in particular was very playful, enjoying tickles on the belly and high fiving during interactions.

Approaching weaning, as their interest in their supplement feeds decreased, and they were more interested in bamboo and the panda bars. Most Red Pandas in the region are on a high fruit diet, and we were not wanting the cubs to get a taste for fruit as we had planned to raise them on a complete fruit free diet

of Panda Pellets made into a 'Panda bar' and Bamboo to ensure they received a fully nutritionally balanced diet.

Their parents were also on a Panda bar diet – though with pieces of pear added as we were in the process of weaning them off fruit. So as the cubs increased their intake of solids, the pear in Pabu and Kesaris panda bars was slowly decreased to ensure the cubs did not develop a love of fruit.

The cubs supplement feeds had now begun to decrease by a 1 to 2 ml each day until fully weaned. During the weaning process, Pandas have been known to starve themselves and refuse to eat if done too quickly so the process was very careful and we made sure the cubs were eating a sufficient amount of panda bars and bamboo before we began to decrease. Mohan and Raja had both taken to the panda bars well, but Phinju was refusing to eat them. I tried many ways to offer to him, even by mixing with the milk supplement that he loved, but as soon as anything had touched the bars, he refused to eat it.

Mohan and Raja now almost fully weaned had taken over Phinju in weight and he was falling behind. Action had to be taken to get Phinju onto the bars, so I asked permission to blend up a small amount of pear to make them more palatable. I decided to blend the pear as this would not allow him to pull only the pear from the bar. I began offering the pear bars to him on the floor, hidden by a Lomandra so that the rest of the family could not see, or smell the pear. And he began to eat them!! This was a

massive relief.

As this had helped him to get a taste for the bars, he was then observed eating them with his brothers that had no pear in them. The pear in his bars was slowly reduced over the coming weeks and by then we were able to successfully wean him off them and it all went fantastically. We had now weaned all three cubs and mum and dad onto a complete fruit free diet.

There were many challenges we faced along the way, but I am proud to say that Kesari and our fellow keepers did an amazing job and we hardly hit any hurdles. The triplets have now hit sexual maturity and have been separated from mum and dad so that they can do it all over again, with our two newest bundles of joy. Two more boys!! Mohan has gone to his new home at Halls Gap Zoo where he is very happy and loving his new Keepers.

A special thanks to all of the industries that gave us guidance, we couldn't have done it without your help.

- > Catherine Nichols, Curator – Hamilton Zoo
- > Courtney Mahoney, Carnivore Keeper – Taronga Zoo
- > Louise Ginman, Unit Supervisor, Carnivores – Taronga Zoo
- > Lucy Catt, Mammal Keeper – Adelaide Zoo
- > Lauren Booth – Team Leader, Carnivores – Auckland Zoo



Cubs weaning onto panda bars



• ASZK • MEMBERSHIP STATISTICS

299 FULL MEMBERS

3 FULL PARTNERS
MEMBERS

72 ASSOCIATE
MEMBERS

1 ASSOCIATE
PARTNERS

17 RECIPROCAL

16 CORPORATE

13 LIFE MEMBERS

3 OVERSEAS

3 OVERSEAS
CORPORATE

TOTAL 427





Zachary Mackenzie

Bird Keeper
Featherdale Wildlife Park

• MEET AN ASZK MEMBER •

For how long, and whereabouts, have you worked in the Zoological Industry?

I've only worked in the Zoo industry for a short amount of time; starting as a bird keeper at Featherdale Wildlife Park in 2016 and working casually at Mogo Zoo. I've always had an interest in birds and a hobby in Aviculture. Working with a zoological collection full time has been rewarding and a massive learning experience.

What is your favourite animal, and why?

At Featherdale the Nicobar Pigeon is probably my favourite species to work with. They maybe common overseas, but in Australia there is only a small genetic pool and most birds are in zoological collections. They are a very cool looking pigeon and the only extant member of their genus; believed to be the last living relative of the Dodo. I do have a lot of favourite birds, working with Hornbills or Sturnids would be a dream.

What is your favourite thing about Featherdale Wildlife Park?

Besides the birds, I love the team at Featherdale and the history of the park. Landscaping aviaries and collection planning for themed exhibits is great.

What changes or improvements would you like to see in the future of zookeeping?

I'm still getting to know the industry and my place in it, but I'd like to see zoos continue to work together with program species and recovery

projects in conjunction with other relevant bodies. That way the future of zoos can continue to withhold value in society for the hard and rewarding work keepers do.

What is your greatest animal achievement thus far?

My greatest personal achievement would have to be subspecies management and records/data collection for Asiatic parrots or success with Bleeding heart Pigeons. I also got a lot out of my husbandry manual on Red Junglefowl and handraising my first Barking Owl at Featherdale.

What is your most memorable experience with wildlife?

My most memorable experience with wildlife is probably searching for the Golden-shouldered Parrot in far North Queensland, I was about 14 years old and photographed a pair just before calling it quits after hours of looking.

What is your most embarrassing zoo moment?

My most embarrassing zoo moment would probably be falling into the skip bin when I was emptying another.

BEHAVIOUR matters

DIVERSE LESSONS WITH A DYNAMIC DUO: TRAINING ADELAIDE ZOO'S BARKING OWL BABIES

MICHELLE BIRKETT | PRESENTER – KEEPER | NATURE THEATRE TEAM
ADELAIDE ZOO

The free flight show at Adelaide Zoo showcases multiple parrot species and one owl. Oscar the sooty owl is a handsome member of our cast, but sooty owls are known for their sedentary nature. While we adore Oscar, we are finding ourselves limited in the number of behaviours we can display. Our goal is to include more active owls in our presentation, so we decided to hand-raise and train some barking owls for this role.

STARTING OWLT

Two suitably aged chicks were sourced from Gorge Wildlife Park, and came to us as stinky balls of feathers with giant yellow eyes. Due to their eye-watering aroma, their first stop at Adelaide Zoo was straight into a bath in the capable hands of vet nurse Lynette. A good wash revealed bright yellow feet to go with their eyes and odd feather growth that made them look like grumpy old men. They were christened (Owl) Pacino and (Owlbert) Einstein. If anyone is familiar with our Nature Theatre team they would understand how well 'punny' names are received. At a later date, they were DNA tested and are both female but we stuck with the masculine names.

After their bath and a vet check, it was time for their first feed in human care. With a tiny piece of mouse on tweezers, I gently tapped the side of their beak to feed. They didn't take the food, so I cupped their bodies to mimic the way their parents would stand over them to feed them and that was enough to stimulate feeding response. The second feed they readily took food from the tweezers. It



Dynamic Duo

was essential to begin training them to orient towards people as soon as possible. Once they were feeding well, criteria were set for a feed with approximations leading towards stepping onto a glove. The cue was a whistle, and the first approximation was simply for the chick to turn and look at the trainer. The next approximations were to turn their entire body towards the trainer, then to crane their necks and finally to take steps forward.

The owl chicks travelled back and forth between my house and the zoo, and they were drawn to the safety of their pet pack. This positive association is considered useful in the future if we need to transport them for medical reasons or for presentations. At home, the owls were allowed time to explore the house. This provided some great opportunities



for generalisation, and they met people of different ages and sizes, heard strange noises and saw new things. When there are babies in the house it is tempting to make everything as quiet as possible, but instead I fed and trained them in the presence of noise whenever possible to prepare them for life as an animal ambassador. It was also great learning curve for me in what an owl-proof living room looks like and a few ornaments and picture frames were sacrificed.

Early on, it was apparent that despite the similar genetics and upbringing, the two chicks differed greatly in their styles of learning. Pacino, the slightly older chick, was quieter and less likely to beg. Although she wasn't as quick to move forward, she was actually the first of the two to willingly step onto a glove and fly to the glove. I expected her to be the stronger ambassador due to her calm and quiet demeanour. Einstein was more vocal and willing to approach the trainer, but was also more likely to fly away.

THEIR TALONTS EMERGE

They fledged and began to live full-time at the zoo. A new training plan was drafted to further their training. Our long-term training goal was to have the owls free fly between two trainers in a presentation. Our short-term goals were approximations to achieve the long-term goals. We started with flying towards trainer to perch, stepping up onto glove, flying to glove and sitting calmly on glove. They were also reinforced for approaching and walking into their petpack so that they maintained the positive association they established as chicks. Once again, Pacino led the way and was the first to fly to glove and sit calmly. We began finding it difficult to manage the behaviour of both birds in a small area when training alone, as the more confident one would respond to a cue for the other bird.

As they grew into adults, Einstein became bolder and Pacino became shyer. Although she was slower to respond in the beginning, Einstein made up for lost time and began responding to cues quickly and accurately. She also seemed to have a more generalised outlook – she was willing to fly to a trainer she had never met before, if they cued her. Pacino, however, would only respond to people she knew. Pacino was also very aware of her surroundings and would not respond to cues if there was a different noise or different person in the room. We realised that the one training plan was not working for each owl – they were moving at different paces, their willingness to respond to various cues differed and the antecedent arrangement for each owl was different.

Einstein's new found boldness had another effect. When trying to train Pacino, Einstein would attempt to land in

the same spot and then a tussle would occur. This led to an undesired consequence of performing a behaviour for Pacino. Instead of cue-behaviour-reinforcer, Pacino was experiencing cue-behaviour-get smacked by your sibling. As a result, when we would offer a cue to Pacino, she would turn and look at Einstein instead of undertaking the desired behaviour. It was time for the owls to be housed separately.



Michelle with Einstein

OWL BY THEMSELVES

Separate housing enabled us to concentrate on the different learning styles of each owl. Einstein began flying between trainers' gloves and going for short walks on glove. In Einstein's absence, Pacino began flying to glove again, although she developed a new behaviour of trying to grasp the glove in her talons and flying away. She is also alert to other noises and people, not responding to cues when something as simple as a feather floating across the floor caught her eye. It was clearly highlighted to us again that even animals with identical upbringings can vary so much in the way they see and interact with the world around them. We selected barking owls as our species as their natural history predisposes them to the type of

display we would like to achieve. However, we must also acknowledge that there is variation between individuals and some birds are better candidates for different roles than others. We will keep working with both Einstein and Pacino and find roles that are suitable for their differing personalities. While Einstein is progressing to meeting the public, we have stripped Pacino's training back to very simple behaviours such as flying towards us to really solidify that association of humans with reward.

While we often focus on the trainer acting as teacher and the animal as the learner, this has been a great learning experience for myself and the owls have certainly taught me a lot too. Pacino has taught me the correct way to feed an owl on glove to avoid receiving an injury from a talon. Einstein taught me not to always lessen criteria when the first cue isn't responded to as she learnt that she could do less for the same reinforcement simply by waiting. This was also my first experience hand-raising birds and one I immensely enjoyed.

Einstein is now going on walks around the zoo while Pacino is working on her basic behaviours. Hopefully soon you will be able to come to Adelaide Zoo and see one of them showcasing their natural talents at our free flight show.



• ASZK NEW MEMBERS •

The ASZK Committee would like to welcome the following new members

FULL MEMBERS

DEANE JONES	Paradise Country
REBECCA SMITH	Gumbaya World
LACHLAN GORDON	Kyabram Fauna Park
BRODIE ZEALAND	Moonlit Sanctuary
ISABELLA EVANS	National Zoo & Aquarium
CLARE HOLDEM	Featherdale Wildlife Park
AMY SMITH	Melbourne Zoo
HANNAH WIGGS	Moonlit Sanctuary
STEPHANIE ROBINSON	Darling Downs Zoo

ASSOCIATE MEMBERS

RENEE LE ROY
DEBBIE BURTONCLAY
MICHELLE MEIER

CORPORATE MEMBERS

AUSSIE ARK
KYABRAM FAUNA PARK
AUSTRALIAN REPTILE PARK



GaiaZOO and the EAZA Old World Monkey TAG are proud to announce:



OLD WORLD MONKEY WORKSHOP

29 June - 1 July 2019 | GaiaZOO Kerkrade



This workshop will bring together a wide range of experts to provide the latest details on everything Old World Monkey! From field conservation to optimal nutrition and from enclosure design to animal training.

WORKSHOP FEE €100,- p.p.

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For more information | AnimalWorkshops@GaiaZOO.nl



Call for Abstracts

Keen on presenting your Old World Monkey experiences!? Send in your abstract (max. 300 words) before the 1st of May 2019 to AnimalWorkshops@GaiaZOO.nl



GaiaZOO.nl



MONARTO ZOO *Natives - Devils*

Our joeys from 2018 are now all integrated into one group post weaning, they recently moved yards from a fully enclosed aviary to an open air enclosure specifically set up for the amount of activity they require. All six are thriving and starting to show us their personalities.

With the arrival of five new devils the breeding season crept up quickly with our first intro taking place late January and another beginning of February, this required us to place a female in quarantine with a new male, they remained denned together for eight days which was great to see considering the circumstances we faced.

We have had more devil introductions occur through February and have started to pencil in dates for birthing and pouch checks which is always an exciting time of year.

Carnivores

We've been kept pretty busy on the Carnivore rounds so far this year. Now that our new male lions have settled in they have begun to make an appearance at our 360 experiences; impressing visitors by climbing around on the dome roof and troopie. With the New Year we also started introducing them to our females via mesh contact. All individuals are doing well and growing in confidence



through this process. The young females became more assertive watching the more experienced females' interactions. Very positive signs have been observed including rolling, tail flagging and relaxed resting along the mesh.

Unfortunately, our African Painted Dog introductions didn't go as well as we had hoped for. After weeks of mesh contact four males were introduced to two females onto a carcass feed in the main exhibit. After initially feeding together the males began to chase and injure both females resulting in the need for keepers to intervene and separate. Fights and injuries can be common during painted dog introductions. As we had little success with these group dynamics discussions are underway for management options moving forward.

Our hyena clan is going strong and have had a couple of opportunities to socially feed on carcasses all together (below) We are seeing some interesting behaviours between the 18 month old twins (male and female) as they wean from mum.



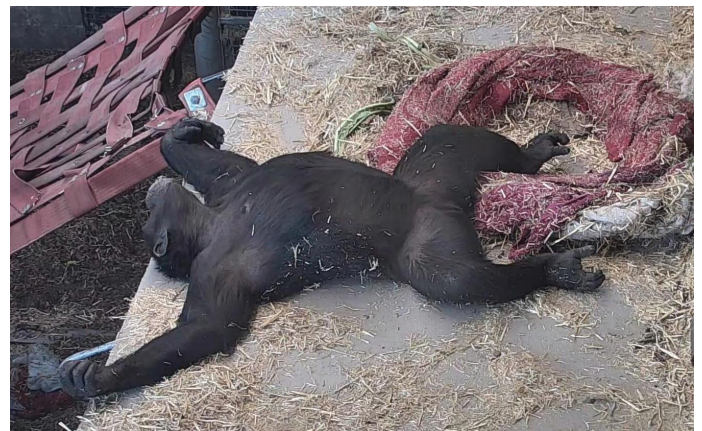
On Cheetah we have just completed their quarterly blood draws for all 16 individuals. This is a big achievement as all blood draws are done voluntarily while the cheetah sit comfortably in their crush. Our new raceway from G yards to the platform exhibit is almost completed which will give us much more flexibility. Lastly, work has started on a new mixed carnivore/lion exhibit raceway that will allow us to move hyena and dogs into the lion exhibit (when lions are not there!) which we are very excited about!

Rachel Hemming, Monarto Zoo

Primates

With summer in full swing and record high temperatures across the state our Chimpanzee troop have been cooling off in a variety of ways. They love to spread out to our behind the scenes area on days above 40 degrees when the zoo is closed. One favourite spot is in the raceways which creates a cooling wind tunnel.

To help the troop cool off, we have been setting up lots of water interactions. These include streams of water going into different areas, paddling pools filled with herbal tea, bottles of water clipped to mesh and juice bucket ice blocks hung around the facility.



Cooling off on a hot day

With the hot weather the wild snakes to the area have become more active and have been seen within the Chimpanzees exhibit. When possible we recall the Chimpanzees to different areas away from the snake but occasionally the snake has ended up indoors! previously our Chimpanzees have instinctively known not to touch the snake but instead have been known to pull chimps getting to close indoors, move above to throw rocks at the snake and even swatted them out of the external exhibit with branches. Recently a Brown Snake found access into the inside dayroom via a raceway. Our Alpha male Tostis took matters into his own hands and was seen protecting his family. Firstly alarm calling to the females and youngsters to move to the above platform, then with back up from the other adult males he tried to shoo the snake out to no avail, he then grabbed the snake and ran to the race way to throw it outside. This encounter left staff and guests stunned at what they saw. Due to the uncertainty on whether he was bitten or not, keepers kept a close watch on him into the night with vets on call. Thankfully no reaction was inflicted. Since that time the snake has gotten close to the Chimpanzees on a couple of occasions and

Tsotsi has again intervened to protect his troop. All these interactions are closely monitored – prior to this season we have never had a snake get this close to the chimps and it does seem to be more the individual snakes bravery rather than the Chimpanzees curiosity.

Zombi our Alpha female and mother of six year old Zuri and three year old Enzi, has recently been taken off of the contraception pill. She has been cycling regularly and we have seen a positive shift in her confidence. On the flip side Tsotsi has become very busy guarding our very popular female from the other males. By the time you read this we could have a new addition in the Chimpanzee house. Hannah is pregnant and is due in March, she joined the troop from Taronga zoo early last year. The keepers are making preparations for the impending birth with extra bedding, monitoring and review of procedures - everyone is very excited for her and the troop.

Lisa Morrison, Primate Keeper Monarto Zoo

HALLS GAP ZOO

The hoof stock team welcome numerous additions to the collection, with ‘Zawadi’ a young 22-month-old Giraffe making the trek from Altina Wildlife Park on the 6th of February. After an easy journey, despite the crazy weather conditions, he joined our two 10 year old boys Pumika and Suamari. Introductions went very smoothly and the group are interacting well, both with one-another and with visitors during animal encounter opportunities.

Zawadi has proven to be an outgoing individual who is quickly winning the hearts of the keepers and public alike. He happily interacted with visitors on his third day on site and has proven to be a huge attraction for everybody.

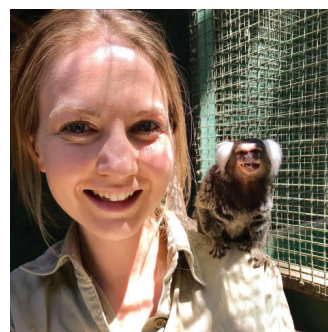


The addition of two Barbary Sheep, from Monarto zoo, grew our collection to four individuals. The larger group has added to the confidence of all individuals, enabling them to approach and interact with keepers again. Summer has been as unforgiving season this year; we have had some runs of extreme heat that have provided some challenging days for keepers and animals. We have suffered some losses over the past few months, as the primate team had to say a heart-wrenching goodbye to ‘Steph’ (below) our beloved female Black and White Ruffed Lemur. Aged 24 years old, Steph was a beautiful individual with an unforgettable sassy attitude, who is incredibly missed by all keepers.



Aside from animals, the team gained another terrific addition, with Laura Chapman (below) making the move from New Zealand to call the Grampians home. Laura is an experienced primate keeper, who has brought a new pool of knowledge to the group. She is enthusiastic about animal training and relationship building with the animals in her care and the team looks forward to sharing in these skills and welcoming her to this wonderful community.

Veronica Gordon & Brit Hides



CURRUMBIN WILDLIFE SANCTUARY

Currumbin Wildlife Sanctuary launched the new free flight bird show 'Wild Skies' in the newly renovated stage on New Years day. Our presentations team did an amazing job getting our birds accustomed to the new purpose built stadium in time for the launch and are now presenting a fantastic show twice a day.

Our Eastern Bristlebird program has kept the Bristlebird keepers busy setting up enclosures at David Fleay Wildlife Park in preparation for birds moving there in March. We also have a collection trip scheduled in order to recruit 2 pairs of Eastern Bristlebirds from the wild. 2019 is shaping up to be a big year for our Bristlebird program and keepers are excited about the upcoming research and collaboration with multiple agencies. Our Kroombit Tinkerfrogs unfortunately have not bred yet this season. It has been unseasonably dry here on the Gold coast and the lack of a good low pressure system may have been a factor in this. Hopefully a good storm before the end of the season will be the trigger they need to breed.

Breeding has been sporadic this season in general due to the hot dry weather. Species that we did breed include; Sacred Kingfisher, Moluccan Red Lory, Mandarin Duck, Superb Fairy-wren, Rainbow Lorikeet, Brown Cuckoo-dove, Crested Pigeon, Buff-banded rail, and Bush Stone-curler. Our Wompoo Fruit-doves and Noisy Pitta have been trying hard but not succeeded these last couple of months even after multiple attempts and fertile eggs. We found embryo's had died late stage which may have been attributed to the crazy weather patterns we have been enduring. Our Black-necked Storks have sporadically been displaying nesting behaviour and going through the motions but nothing has come of it yet. The mammal team are very excited to have ten koala joeys in the pouch at the moment, with a few more possible by the end of the season.

Recently our group of Grey-headed flying foxes were transferred to a new enclosure. It was difficult to manage them in the previous enclosure as they would hang out at the highest point of the enclosure (about 7m high), which made accessibility impossible. As a result of this situation we were unable to provide any positive experiences for the bats so despite the large space, they remained fearful of keepers and were barely visible to our guests. They have settled in well to the new enclosure and keepers have very quickly been able to condition them to remain calm during enclosure husbandry/maintenance and are now more visible to guests. Now that they are comfortable with Keeper presence we have started to alter their



Sacred Kingfisher chick bred at Currumbin Wildlife Sanctuary

feeding regime so that we can commence with a training program to improve their welfare. The planned addition of a scheduled keeper talk/feed will also provide a great opportunity to create positive guest experiences and convey important conservation messages.

Lastly, we are working on a cupcake fundraiser to generate much needed money to support the efforts of institutions and volunteers working in South Africa rescuing and hand rearing Lesser Flamingo. We hope to contribute to this effort with a sizeable financial contribution.

Saskia Lafebre

MELBOURNE ZOO *Director News*

Kevin Tanner has retired as Director of Melbourne Zoo and has also resigned as the President of The Zoo and Aquarium Association (ZAA). For the past none years he has called the zoo his home and we wish you the best of luck on your travelling adventures.

Filling the role of Director Melbourne Zoo will be Michelle Bruggeman. Michelle is stepping out of her role of overseeing Corporate Services and Corporate strategy at YMCA Victoria and has over 25 years' experience in executive and business management, corporate services, project/program management in the Corporate, Government and Non-profit sectors. Welcome Michelle!

Carnivores and Ungulates

The team is saddened by the loss of six-year-old male African Wild Dog, Saba (pictured below). Saba was one of four brothers who make up the African Wild Dog pack within Carnivores Trail. Due to the social dynamics of Wild Dogs, the changing hierarchy can cause aggressive behavior towards each other. Saba sustained severe injury to his leg, the vet team advised repairing the damage nor amputation wasn't viable for an active pack animal and would negatively impact Saba's quality of life. Therefore, the tough decision to say goodbye was made, our thoughts are with all that cared for him.



Primates

After the arrival of three baby Hamadryas Baboons last year the troop and the primate team were kept busy. However last week they had to bid farewell to the much loved 26-year-old female Baboon Grim. She was one of four original Baboon girls here at Melbourne Zoo. Grim loved to eat, eat and eat absolutely anything and will be sorely missed by all her keepers and our visitors.

Reptiles, Invertebrates & Education Animals

The Education Animal team has moved their 2 Blue & Gold Macaws, Pablo and Goldie and 2 Eclectus Parrots, Lamaroo and Pinaroo over into their brand-new aviaries. These aviaries were a long time in the making and is attached to the Keeper Kids building, which the birds can have access to via a slide door, for future education programs. The birds have settled in great and are now on display too.



Grim the Hamadryas Baboon was one of the original baboons at Melbourne Zoo

Melvin Nathan

TARONGA WESTERN PLAINS ZOO Elephants

In December Gung was in musth again for the 3rd time last year. This is an uncommon phenomenon in that once bulls reach sexual maturity they usually cycle annually in musth and historically for Gung this was January. This could have been triggered by the presence of the young bulls, Luk Chai and Pathi Harn as well as the ensuing oestrus cycle of Thong Dee (25th December). All the time in musth he completed his daily routine and had very few aggressive outbursts towards keepers. During this time both young bulls showed evidence of being in musth as well but for a far shorter time (days/week). The team had been asked to assist with an impending AI (Artificial insemination) at Melbourne zoo. Being in musth bull elephants are more unpredictable in nature and this forced the team to postpone any conditioning for semen collection. Fortunately in January Gung completed his musth and we have been able to resume his conditioning for a semen collection procedure. He has now had more social days with the cow/calf herd and his son Luk Chai. In the coming months we will introduce Gung to Pathi Harn for the first time since we have completed tusk trimming on both individuals. It is a team goal to exhibit all three bulls together and provide another social opportunity for these bulls.

Kanlaya has continued to flourish and her training/conditioning began in September 2018. She will come to keepers when called and offers her trunk for tactile conditioning. Kanlaya has become confident in the pool and will swim with the herd. She has been observed swimming with Sabai (2 year old bull) without support/

assistance of her mother or Aunty Thong Dee.

Sabai continues to improve in his daily routine and now has four keepers that can work with him. His biggest achievement is accepting blood draws for EEHV testing which is done fortnightly along with the young bulls. We have managed to procure a sedative ointment (advice supplied by Albuquerque zoo elephant team) that has helped immensely in completing this procedure.

Thong Dee and Porntip continue to support their calves and accommodate Gung and his advances when socialised. We have ensured that either cow is not in oestrus when social events occur. This has been managed by blood sampling and collaboration with the the Zoo's lab and recording their oestrus cycles. We have a calendar and document necessary information so that the team is aware.

The aged cows, Burma and Gigi have suffered during the summer heat this year with a large number of days over 40 degrees. Gigi in particular has shown the most decline. She has decreased in weight during this period. Gigi has been under veterinary examination regularly. We have increased her diet and have made facility changes to allow for her to be more comfortable.



Aged Cows Burma (L) and Gigi(R) dust bathing. Photo – G Sullivan

In January the team said goodbye to Bobby Jo Vial who has worked for Taronga Conservation Society Australia for 12 years, five years at with the Taronga Western Plains Zoo elephant team. Bobby – Jo has retained a casual position at Dubbo which allows her to continue with her photographic passion in Africa. She has been a valued member of the team and we will miss her dearly. We also

wished Rebecca O'Riordan the best for her impending delivery of a new family member. Rebecca had returned from a previous maternity leave and we wish her and her family good luck and health and await her return in early 2020. We have also welcomed two new keepers to the team, Christina Nicolas (August 2018) and Shannon Rover (January 2019).

Glenn Sullivan Supervisor, TWPZ Elephant team

ADELAIDE ZOO *Heat Wave*

During the latter half of January, Adelaide experienced some unseasonably hot weather, with temperatures hovering around the 40's for many days. On the 24th of January the temperature rose to a scorching 46.6 °C. Peak temperature records were broken for much of the state. The keepers and horticulture staff had to work hard to keep the animals cool and gardens protected.

Meerkats

Our meerkats produced their third litter for the season. Despite the extremely hot weather and the pups being removed from their den by older siblings to practice parenting skills, four of the five pups survived and are flourishing.

Reptiles/Birds

Our first Western Swamp Tortoise eggs has hatched for the season, with hopefully more to follow. Orange-bellied Parrot breeding season is nearing an end, with 11 chicks fledged. Three in-nest clutches (ranging from 7 - 28 days old) fared well, despite the hot weather in January. Staff worked tirelessly to ensure the entire bird collection remained comfortable throughout the extreme summer heat.

Grey-headed Flying-fox colony

A large colony (~17,000) of Grey-headed Flying foxes is located less than 100 metres from the entrance to the zoo, in neighbouring Botanic Park. The heat wave in January resulted in a significant mortality event. Our Animal Health Department worked alongside Fauna Rescue volunteers, Botanic Garden staff and DEW (Department for Environment and Water) representatives to recover and process the dead and dying animals. A small number of flying foxes were nursed back to health, but most of the animals succumbed. During the days immediately after the mortality event our Animal Health Department measured and scanned (for PIT tags) over 1,700 flying foxes. The resulting data was shared with local research groups.

Pandas

Despite two artificial insemination procedures during September 2018, our female panda, Fu Ni, did not fall pregnant. Fu Ni's urinary progesterone level declined during January, signalling preparation for parturition or the cessation of a pseudo pregnancy, a normal annual process for non-gravid female pandas. Fu Ni's behaviour during this period confirmed that she was in the latter stages of a pseudo pregnancy. The panda team remain optimistic. Fu Ni demonstrates normal reproductive processes and good maternal behaviour, and our male panda, Wang Wang, has healthy, viable sperm.

Primates

Work has begun on the erection of a tunnel system for our Black and white Colobus monkeys. This extension of their existing exhibit will allow them to safely venture out toward the Central Lawn area of the Zoo. We anticipate that they will be cautious, at first, but expect they will quickly become comfortable using the tunnels. We are excited to see what behavioural changes result from the augmented exhibit, which will provide additional space, great enrichment, and opportunity for more activity. A similar tunnel system had a marked impact on the well-being of our Golden Lion-tamarin group. One of our female Golden Lion-tamarins has started to gain weight, a strong indication that she is pregnant and that another litter is on the way.

During December we sent a pair of White-cheeked Gibbons to the Tasmania Zoo. The two gibbons, Nhu and Tiane, were accompanied by one of our keepers to help with the transition. The gibbons have settled into their new home well, and our team have been eagerly following their progress on social media.

Staff

Our new Curator, Mark Smith started at the zoo in January. Mark's professional experience includes the design, construction, and operation of world-class zoological facilities, with a strong emphasis on exhibition, research, conservation and education. He has worked at Sea World Australia, L'Aquàrium de Barcelona (Spain), Oceanário de Lisboa (Portugal), Ocean Explorium (USA) and New England Aquarium (USA). He has consulted on more than 50 projects around the world.

Jodie Sheridan, Mark Smith, Murray Guy



DES SPITTALL SCHOLARSHIP for KEEPER DEVELOPMENT

The Australasian Society of Zookeeping operates and manages the annual 'Des Spittall Scholarship for Keeper Development', which is available to any ASZK member who has been a financial member for two years or more. The annual scholarship is named in honour of the late Des Spittall, a life member of ASZK. It is to the value of \$2,000 and has been established to support the professional development of zoo keepers in the Australasian region.

Scholarship applications can be sought for the following (but not exclusive) types of activities;

- Research projects
- Undertaking volunteer work on local conservation projects
- Working on community change or capacity building projects
- Undertaking study either in Australia or overseas (overseas study will only be supported if nothing comparable is in Australia or New Zealand)
- Attending a conference or workshop
- Study tour of zoos or institutions

Prospective applicants are invited to submit a written proposal for their intended proposition, outlining in as much detail as possible the aim, purpose and the anticipated outcomes of the activity. This includes how the activity may support development of colleagues.

All applications are then evaluated by the ASZK Management Committee within a fortnight of the closing date with applicants informed shortly after.

Successful applicants will be required to submit a report at the end of their project term detailing outcomes and expenditure records. An article for *Thylacinus*, or a presentation to the ASZK or ICZ annual conference on the project is also encouraged.

To obtain a full version of the brochure including application form visit www.aszk.org.au or contact Liz Romer at slromer@bigpond.com. **Applications close 30 May 2019**



EXPEDITION MOROCCO

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INTRODUCTION

The country of Morocco.

In 2018 we were invited to participate in a reptile expedition to Morocco, a small country on the north western side of Africa, on the edge of the Sahara Desert.

This was an operation sponsored by the European H.E.R.P organisation (Herpetological Education and Research Project) based in Belgium. Bryan Minne and Laura Ruysseveldt were our expedition leaders, with around fifteen other members along for the expedition, including scorpion and venomous snake specialists.

The week-long field trip was conducted during October to escape the cruel heat of Summer and maximise our chances of finding reptiles active in the cooler Autumn months. Specific localities are not mentioned in this article as some Moroccan species are highly sought after in the European reptile trade.

METHODS

The aim of the mission was to identify, photograph and remove as many reptiles and scorpions as possible from the many water cisterns in the desert regions of Morocco. The larger water cisterns collect any runoff rainwater from sporadic storms and pipe it to towns and villages. These larger wells generally contain water so if animals fall into these they usually drown. Entrances to these wells were sealed off with bushes and rocks to allow water to enter but to prevent the entry of smaller animals. The smaller wells are usually dry and around three cubic meters in size, constructed of concrete and contain shut off control valves for the pipeline. Each one is covered by hinged metal lids (see photograph) which over time become rusted, damaged or left open - allowing small mammals and reptiles to enter the pits and become trapped until being released or perishing. Our mission was to inspect these pits and remove any live animals and document any dead animals for future reference, and to then reseal the lids. A rock is left on the top of each lid to indicate that it has been checked. Hundreds of cisterns were checked daily in different locations.

The local communities benefited from us cleaning out the wells as Morocco is home to many venomous snakes and dangerous scorpions that pose a serious threat to the local people who have very limited medical treatment options,

the nearest hospital may be many hours drive away. Also antivenom may not be readily available. Of the 27 known species of snakes in Morocco at least 7 species are currently considered dangerous to humans.



The author lifting the metal cover on one of the smaller wells.. Photo Catherine Sonnemann

Morocco has a huge scorpion fauna, most of them not dangerous for humans but a few can deliver a fatal sting. Most notorious are *Androctonus australis* (Northern Morocco), *Androctonus amoreuxi*, *Androctonus mauritanicus* (Middle to South Morocco) and *Hottentotta gentili* (Middle to South Morocco). These scorpions cause multiple fatalities in Northern Africa and the Middle East. Healthy adults are not likely to die from a sting, whether defensive or a full blown attack. A defensive sting usually result in only minor effects including sharp pain which can last multiple hours and discomfort. A full blown attack will result in pain for the first hours, after this the next steps can take place and will result in serious effects. Defensive stings usually take place when someone is not alert and places a finger or toe near the scorpion which

will react to this by giving a fast sting before running away.

A full blown attack only takes place when someone tries to capture the scorpion or for instance puts a hand on top of the scorpion. The scorpion feels threatened for his life and reacts immediately.



Androctonus species scorpion found inside one of the lids.
Photo Catherine Sonnemann

All of the expedition members had previous experience in the correct handling of dangerous snakes and two members from the Dutch Scorpion Society attended, who are experts in this field. Before any wells were opened we were treated to “scorpion school” in the desert (see photograph below) so that we could identify the dangerous scorpion species that can be found around the lid openings, a favourite hiding place for them to escape the desert heat. Leather gloves were mandatory for opening the lids and thankfully nobody was stung by the many scorpions we uncovered.



Other hunting methods were also employed in the search for wildlife. The convoy consisted of four passenger cars used for slow road driving during the cooler daytime hours and at any time during the night. By staggering the cars at around ten kilometre intervals the chances of finding reptiles crossing the roads was maximised. We also walked a lot! In favourable locations we would spread out in a line around one kilometre wide and walk a compass line into the dune-fields and cactus deserts for several kilometres. We would then return on another compass line to the cars waiting on the road. Again this would maximise our chances of finding animals. Resources are limited in this harshest of environments and wildlife is very scarce on the ground, often we walked or drove for hours and found no larger animals. Insects and scorpions could be found under rocks or clinging to the branches of small shrubs.

RESULTS

The animals found included several species of scorpions, five species of vipers, several harmless snakes, many geckos, a couple of chameleons, skinks, dragons, spiny tailed lizards, jumping rats and ground squirrels. The Egyptian Cobra, *Naja haje*, was a target species but only one recently killed adult was found on a main road. The species list is too long to publish here but a couple of interesting species are mentioned.

The Puff Adder - *Bitis arietans* (below)



One large adult female found at midnight by foot searching in low cactus desert. This individual was active in the open and thought to be waiting in ambush mode for passing prey. Mammal burrows were common in the vicinity. At over one meter in length and of massive girth it was an impressive animal. These snakes can weigh in at over 7 kilos. It is considered a Vulnerable species in Western Sahara due to the relict character of its distribution and the systematic destruction of its habitat.



Brossets lizard-toed gecko –

Saurodactylus brosseti

A tiny gecko restricted in distribution to the slopes, plateaus and western plains of Morocco and the northern part of the Western Sahara. Several of these attractive lizards were found under rocks and in cisterns. They are up to 30 mm snout-vent and 60 mm total length with an intense orange tail. Classified as Vulnerable and lower risk- near threatened in the region.

Jerboas – *Jaculus species*

The greater Egyptian jerboa, *Jaculus orientalis* is a species of hopping rodent found in Algeria, Egypt, Libya, Morocco, Saudi Arabia, Tunisia, and is possibly extinct in the Negev Desert of Israel. Its natural habitats are subtropical or tropical dry shrubland, sandy shores, and arable land.

Several of these interesting rodents were observed jumping around on roads and also trapped inside the smaller cisterns. They exist on plant material that also satisfies their need for water in the desert environment. They are important food items for the larger snakes and Fennec foxes, *Vulpes zerda*.

Over the course of one week in Morocco we travelled hundreds of road kilometers, walked stony and sandy deserts, examined 540 cisterns and removed as many live animals as possible. We were based in a very comfortable eco-lodge and were well looked after by our Moroccan hosts.

The next 2019 expedition is now in the planning stages.

REFERENCES

Geniez, Philippe et al (2004) "The Amphibians and Reptiles of the Western Sahara, an Atlas and Field Guide" Edition Chimaira 229 pp.

Website - <http://www.moroccoherps.com/en/Inicio/>



*Tour leader with adult Brossets lizard-toed gecko.
Photo Catherine Sonnemann*



The author with Jerboa found active on a road at night. Photo Catherine Sonnemann

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Japanese macaque / Photo by Aki Toyoda

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