



koala
conservation
australia

GUM TIPS

SPRING 2023



2019 Black Summer
Bushfires

50 year History of the
Koala Hospital Clinic

The Future
for KCA





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Cover: Koalas who have been featured in the last 6 years of KCA. Top left: Kaylee 2018, who was the “Author” of the regular column in Gum Tips, updating members of affairs at the Koala Hospital, written by long-time volunteer Gabby Rivett. Sadly Kaylee passed away 2019. Top right: Koalas, Wauchope Jade and her joey, Roto Jaz, born at the Koala Hospital in 2022. Bottom left: Koala joeys, Granite St. Peter and Allunga Ave. Daisy – both released recently in 2023. Bottom right: Ruins Way Baz was named after one of the two firefighters that found him burnt and sitting on the side of a track, during the peak of the 2019 Black Summer Bushfires.

KOALAS – OFFICIALLY A ‘THREATENED SPECIES’

SCOTT CASTLE

Koalas’ level of threat is classified as vulnerable, endangered, or critically endangered, on state, national and international scales.

Native Australian flora and fauna face multiple threats to their existence. These threats often interact to create cumulative impacts. However, many threatening processes affect species through the degradation, fragmentation or loss of habitat. This leads to reduced genetic variation, which impedes a population’s ability to adapt to environmental changes, and increases the risk of extinction.



A young male koala in natural habitat.

Habitat degradation occurs with changes in land use, which reduces the amount of habitat or the overall health of the ecosystem. Some causes include the introduction of invasive plant and animal species, pollutants from

industry and agriculture, overexploitation of natural resources and changes in environmental conditions.

Fragmentation of habitat, caused by construction of roads and other barriers, restricts movement of individuals in populations, reduces an individual’s ability to browse, can lead to compression of home ranges, population bottlenecks, inbreeding and increased occurrence of disease and illness.

Habitat loss from clearing habitat for urbanisation, logging, mining, and agriculture can result in immediate death, as well as those stressors previously listed.

River systems are increasingly affected by water extraction for industry and agriculture. This can lead to altered river flows, loss of connectivity and catchment changes such as altered land use and vegetation clearing, and ultimately affect water availability, river health and ecosystem integrity.

Estimates of survivability of small populations is usually based on genetic models. Population (or genetic) bottlenecks are more likely in fragmented or isolated populations, and the resulting smaller populations are typically subject to genetic drift, which can easily drive them to extinction in only a few generations. Genetic drift can cause genes to disappear completely from a population, and forevermore limit genetic variation. It may also cause once rare and detrimental genes to become

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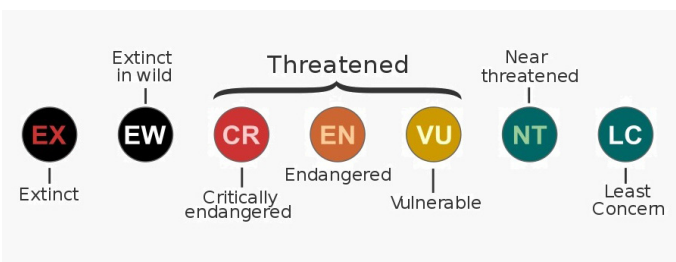


more frequent, and even fixed, therefore remaining in subsequent generations, decreasing survivability.

A threatened species is any species which is threatened by extinction. The level of threat is classified as vulnerable, endangered, or critically endangered, on state, national and international scales. These categories exist to help prioritise the conservation efforts to recover diminishing populations of species. Plants and animals become endangered for two main reasons: loss of habitat and loss of genetic variation.

The most widely accepted global authority is the International Union for Conservation of Nature (IUCN). The IUCN is a leading organisation in determining if a species can be considered a threatened species or not.

In Australia, National Threatened Species Day is 7 September each year. A day when Australians shine a spotlight on our native plant and animal species facing similar fates to that of the Tasmanian tiger, a thylacine (*Thylacinus cynocephalus*), which became extinct on that same date in 1936. Sixty years later in 1996, the Threatened Species Network founded by WWF-Australia and the Australian Government's Natural Heritage Trust established National Threatened Species Day to commemorate the death of the last Tasmanian tiger at Hobart Zoo.



The IUCN risk categories

The IUCN designation of threatened species

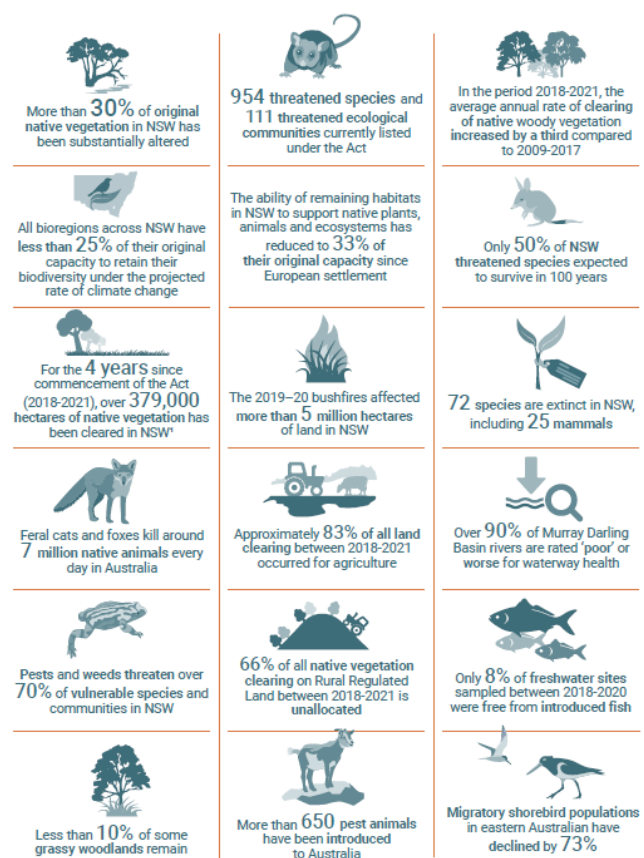
The definition of the three threatened categories follow five criteria: geographic range, population size, population restrictions, population reduction rate, and probability of extinction. Most of the Australian methodology for evaluating the status of species is based on the IUCN model.

Australia's threatened species are listed by the federal environment minister under the Environment Protection and Biodiversity Conservation Act 1999. Their state and territory counterparts similarly legislate threatened species under their own local laws. Although these lists share commonalities, evaluation methods and gradings aren't always consistent.

Take (of course) the koala, for example. It has three different threat assessment levels, across six separate lists. The IUCN updated the koala's status to 'Vulnerable' in 2014, but last year, the federal environment minister updated the koala's status to 'endangered' but only for those populations in Queensland, New South Wales and the ACT. However, while NSW and Queensland state laws also consider koalas 'endangered', the ACT still regards them as 'vulnerable.'

The listing itself does not stop the threats against a species, however the listing provides a way for governments and non-governmental organisations to prioritise conservation efforts and funding. Most species require multiple integrated management responses to address their threats. For almost all species, and especially our koalas, the key conservation response is habitat retention and restoration. Consideration must also be given to the future effects of climate change on species across their geographic range, to reduce the chance of fragmentation due to emerging environmental barriers.

Independent Review of the Biodiversity Conservation Act 2016 – Final Report



*Note, some cleared land has been re-vegetated, and canopy cover increases on other land have not been assessed. Sources: EPA 2021; DPIE 2020c; DPIE 2023c; Stobo-Wilson et al 2022; DPIE 2023d; Herwood et al 2022; DPIE 2020b; Nebel et al 2008

Independent Review of the Biodiversity Conservation Act 2016 – Final Report, Department of Planning and Environment, 2023.

THE BLACK SUMMER BUSHFIRES

SCOTT CASTLE

THE AUSTRALIAN SUMMER OF 2019-20	
46,300,000 ACRES ESTIMATED FIRE EXTENT	34 LIVES LOST
3500 HOMES DESTROYED	3 BILLION ESTIMATED ANIMALS KILLED

On Thursday July 18, 2019, at 4:55pm I had no idea how terrifying the bushfire season was going to be when I sent an email to our Wildlife Search and Rescue team (WSR), saying “Heads up! We have a fire burning at Lindfield Park Road, in the bush that wraps around the airport. We may need to mobilise to search sometime in the next week.”

That bushfire moved into drought-affected melaleuca swamp forest, and the resulting peat fire burned for seven months.

Some members of our teams were new recruits, but even the experienced rescuers had not experienced the incredible nature of a peat fire. Sometimes smouldering beyond a metre in depth, and with temperatures in the hundreds of degrees

centigrade, this slowly creeping, subterranean fire ignited trees when they climbed up the roots to the exposed trunks...often unexpectedly and close to us. This was most alarming because Koala Hospital WSR were only allowed to access firegrounds post-fire. What ensued was constant communication with Rural Fire Service (RFS) and Fire and Rescue (F&R) personnel to assess each ignition point. We learnt a little about which 5m high fires were concerning and which were not.

Peat is an organic layer of soil comprising partially decayed biomass, and makes up the world’s largest reserves of terrestrial organic carbon. Peat is also a dense accumulation of fuel, and once ignited, can burn for a long time, even in the face of extensive rains or fire-fighting efforts.

Peat fires are notoriously difficult to extinguish.

The only ways to extinguish peat fires are either to dig them out to stop them spreading, or to saturate the area, which often draws on huge amounts of water to re-establish groundwater levels and rehydrate the area.

Searching through peat fire grounds was inherently dangerous as we could suddenly sink into a metre-deep ash inferno, so access was restricted and closely monitored by RFS and F&R.

We searched the accessible areas as soon as they were opened to us and rescued the fire-affected wildlife over the coming months.



First temperature reading of peat.



Peat temp 77, caption: Peat temperature increasing.



Peat temp 354, caption: Peat temperature at its extreme burn.



Search and rescue team takes a break at Port Macquarie Koala Hospital after an exhausting day at the firegrounds.

That fire was finally declared extinguished on 12 February 2020 after 65 megalitres of reclaimed water were pumped into adjacent wetlands, followed by 260mm of rain over five days. It lasted 210 days, having burned over 2000 acres, of which 990 acres was underground.

Meanwhile, a fire was started in Crestwood Port Macquarie by a dry lightning strike on Saturday afternoon, 26th October 2019, igniting a series of megafires which contributed greatly to Australia's most destructive bushfire season, the Black Summer Bushfires.

Our experience of the Crestwood fire began, as we watched the smoke gradually engulf the town. With unusual northwest winds, the fire spread south through prime koala habitat, and a nationally important, genetically diverse koala population.

Within three days, Lake Innes Nature Reserve (LINR) was devastated by a crowning fire that left little in its wake as it reached Lake Cathie and jumped west into Lake Innes and adjacent National Parks and State Forests.

On the third day, an orange-brown sky plunged the town into darkness by 3pm.

Fires now threatened the town and surrounds from the north and west. Fires southwest of Kempsey joined large fires further south which burned through Bellangry, Kindee and Yarras. By early December this megafire burned 988,422 acres, destroyed numerous homes, claimed three human lives and countless loss of wildlife.

As fires burned in a southerly direction from Port Macquarie, on 28 October, another fire threatened the towns of Harrington, Crowdy Head and Johns River as it burned northward towards Dunbogan. One person lost their life at Johns River, where it also destroyed homes, and burnt more than 29,653 acres.



Port Macquarie township plunged into darkness by the fires.

At the same time, hot and windy conditions fanned a fire at Hillville, which radiated north, east and south. Within a week the fire jumped the Pacific Highway through Koorringhat, Khappinghat and reached Old Bar and Wallabi Point. The following two days saw the fire reach Tinonee, Taree South and Purfleet, while concurrently heading for Nabiac and Failford. These fires burnt 77,260 acres. Then later in December, fires started again on both sides of the Pacific Highway around the Coopernook region and burnt a further 687 acres. The Port Macquarie Koala Hospital volunteer Wildlife Search and Rescue Teams visited all of these firegrounds and searched for affected wildlife.

During our fireground searches the most haunting and bewildering feature was the absolute silence of the forests, now devoid of life.

In some areas we saw no vegetation, no insects, no birds, and only the occasional goanna. I'm saddened by recalling how little was left in most areas immediately after the fires. The rare, unburnt pockets were actual oases with green leaves, insects and small birds.

Our qualified search and rescue volunteer teams worked closely with Fire and Rescue, Rural Fire Service, National Parks and Wildlife Service, Forestry Corporation NSW and Port Macquarie-Hastings Council to collect burnt or injured koalas and other fauna for treatment and care. We couldn't thank them enough for their efforts and assistance.

By mid-November we had admitted 30 koalas from Mid-north Coast firegrounds, and by the end of the fire season, 78 burnt koalas had been admitted to our hospital.

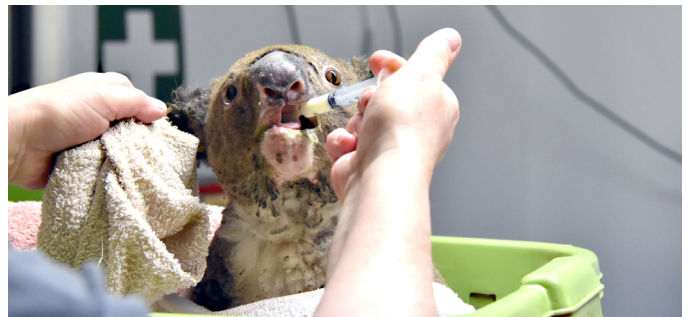
In January, Port Macquarie Koala Hospital sent a team of qualified and skilled Koala Rescuers to Numeralla and Peak View bushfire affected areas. There they assisted teams of rescuers including those from LAOKO Snowy Mountains Wildlife Rescue and Two Thumbs Koala Sanctuary.



Koala Hospital rescue volunteer, Mick Feeney, searches for injured koalas in Lake Innes Nature Reserve.



The Fire trail in Khappinghat National Park.



The first koala to come into our care was LINR Paul, rescued by the roadside.



Above: LINR Anwen with treated paws after he was rescued.

Left: Cheyne Flanagan releasing LINR Anwen after his recovery from the horrific Black Summer Bushfires.



50 YEARS IN THE ENGINE ROOM OF THE KOALA HOSPITAL – THE CLINIC

CHEYNE FLANAGAN

For 50 years the Port Macquarie Koala Hospital has been caring for sick and injured koalas. This is our history of the clinic from Cheyne Flanagan – now our ultimate koala adviser - who has been the key to our success for over 23 years.

The Beginning

Early in 1973, a concerned couple called Jean and Max Starr began noticing wild koalas being hit by cars, running up and down roads and suffering from a mysterious disease. With the support of residents and organisations such as Rotary, Lions, Apex and a few local business' Jean Starr established the humble "The Koala Propagation and Preservation Society of Port Macquarie" and operated it out of Jean and Max's garage.



Treating koalas in Jean Starr's garage being filmed by ABC for A Big Country.

The name was soon changed to the Koala Preservation Society of Port Macquarie, then shortened to Koala Preservation Society of NSW in 2012. (KPS). It became known as The Koala Hospital and is referred to as such in much of this article.

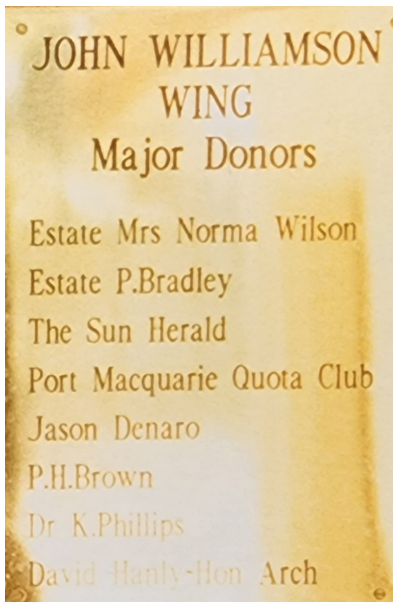
As the organization grew and expanded in 2018 it was changed to Koala Conservation Australia (KCA) which remains in place today.

From home garage to current buildings of the Port Macquarie Koala Hospital

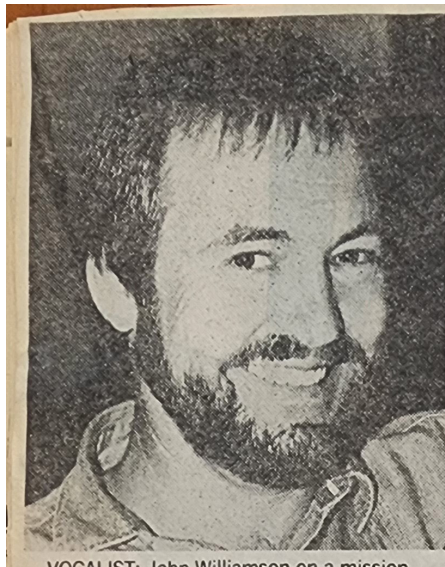
In the 1970s, there was no such thing as a wildlife veterinarian, wildlife hospitals, koala rehabilitation manuals or even licensed wildlife carers.

Rescued koalas were brought into the Starr's garage, their wounds were treated, and they were offered cut eucalypt leaf. Through trial and error, the Starrs learned what the koalas would and would not eat. While we may be surprised by some of the practices in those days, this dedicated group of people were incredible pioneers in the true sense of the word as they literally had no experts to advise them.

In 1974, the NSW National Parks and Wildlife Service (NPWS) was established by the NSW Government. In 1975, the Hastings Council gifted NPWS, **Roto House** and its grounds in Lord Street, Port Macquarie and in turn NPWS allowed KPS to use a small shed and erect a couple of yards to use for their **Koala Hospital**.



The John Williamson Plaque.



VOCALIST: John Williamson on a mission

New song to save koalas

COUNTRY singer John Williamson is a man with a mission — he wants to save the koala from extinction.

John is donating all the proceeds from his latest single to the Koala Preservation Society at Port Macquarie.

In just a few weeks, his Goodbye Blinky Bill single has raised more than \$6000.

"I wanted to write a song that would make people put their hands in their pocket to help the koalas," John said.

"They are a very important symbol of Australia and a song seemed the best way I could help them."

John wrote Goodbye Blinky Bill in one evening and three weeks later was in the recording studio.

"The response has been great," said John proudly.

"After concerts in the country, lots of people have donated \$10 each."

"The single has sparked a lot of awareness and we hope to

By PENNY TROON

have schools behind it as the kids are wanting to learn the song."

John hopes the single which is also on his new album All The Best will eventually raise \$100,000.

"We hope to start a trust which may eventually help all wildlife," he added.

Goodbye Blinky Bill was recorded late last year and is also dedicated to the memory of Bullamakanka banjo player Rex Radonich.

Rex was killed in a car accident earlier this year and the single was his last recording.

John, voted Songmaker and Best Male Vocalist of the Year at the Tamworth Country Music Festival, hopes city folk will support his koala mission when appears at the Pennant Hills Inn, on Saturday May 24 and 31.

15.5.86



1986 John Williamson wrote Blinky Bill as a tribute to the koala decline and contributed funds to help build the John Williamson wing of the Koala Hospital.

In the early 1980s a popular Australian country singer, **John Williamson**, heard about the plight of the koala and contacted Jean Starr. John was so upset by the effects of "human development" on wild koalas, he wrote a song called "Goodbye Blinky Bill", which was written for the Koala Hospital and a percentage of the proceeds were used to help fund the construction of the intensive care ward and the hospital clinic in 1986.

This section of our building is still being used in 2023.

During 2002, as more diagnostic equipment was moved into the hospital clinic and work that had previously been outsourced was now being done on site, it became apparent that this tiny, cramped clinic had had its day!



Treatment room in 1990's included a noisy washing machine.

Trying to assess a koala just admitted because of a dog attack, right beside a noisy washing machine wobbling away and a hallway with no dividing wall to the clinic and being constantly exposed to volunteers walking up and down cleaning out intensive care wards made treating patients difficult. The hospital in those days was a very busy place often with three or more koala patients arriving in one morning.

By 2003 the hospital clinic, the day room and the office were crumbling to the point of becoming dangerous due to major termite infestation





What a mess: Cheyenne Flannagan from the Port Macquarie Koala Hospital (right) with Brad Sage of Ultimate Environment Pest Management and Dave Moore from Ensystex Australasia.

Tackling tenacious termites

PORT Macquarie's white ant infested Koala Hospital now has termite bait stations installed designed to kill the white ant colonies in nearby trees.

not only to kill white ant colonies now but to better protect the proposed new hospital.

Port Macquarie MP Rob Oakeshott inspected the stations on Friday afternoon and was delighted the pest management firm had offered a solution.

financially and as volunteers, and it is recognised as a major attraction for the town and the new building and other planned improvements will make it a much better facility," he said.

and they readily consume it in preference to timber, and once termites start feeding on it, they stop feeding on the timbers in your home.

2005 Port News reporting the Termite infestation at the Koala Hospital.



The damaged section of the Koala Hospital 31.05.2005 before demolition.



2.06.2005 the termite damaged building being demolished.

The walls were so deteriorated that it would have been easy to push a window out onto the ground. A wonderful German tourist called **Annette Hugsen** heard about the building's safety issues, and after returning to Germany, sadly was diagnosed with a terminal illness, and bequeathed what she had to the Koala Hospital. This enabled a new clinic (still in place today), day room, office, and education display to be built, opening in 2005 and adding two further Intensive care units, and a souvenir kiosk.

As part of the 2005 rebuild a decision was made to include a viewing window for the public to observe the koalas being treated and cared for. We wanted the public to see how hard it really is for wild koalas out there and this exposure has been so valuable. The koalas of course are totally oblivious to the public outside the window.

The initial postmortem room was the very small clinic itself which certainly was not ideal, so we moved to a tiny area at the back of the intensive care ward affectionally known as "the cupboard". A fully equipped purpose-built postmortem facility was finally built in 2010.

Having a small purpose-built clinic and intensive care wards allowed a greater ability to deal with and treat wild koala patients.

Media Exposure

In the Koala Hospital's first two decades, there was considerable media interest which included ABC documentaries such as a Big Country, women's magazines running stories on the decline of koalas (1975, 1977), National Geographic (late 90s) and Impulse airlines (1994) printing stories on koalas for their inflight magazines. The headlines in the 70s are not much different to now, except the decline is much more alarming.

Early Research

From the 1880s through to the early 1900s there were recorded observations of koalas curled up at the base of trees suffering from a "cruel eye disease that appears to be making koalas sick" but no one knew what it was. This was still the case right up to the early 1970s when two veterinarians **F.A. Cockram** and **R.A. Jackson** discovered that the bacterium **Chlamydia** was responsible.

In 1975 a veterinarian, **Russ Dickens**, completed a research degree at the University of Sydney on koala blood and koala diseases such as chlamydia.



Through his work a relationship with the KPS developed and deceased koalas and collected samples were sent to him for research. Thus, a connection with the **University of Sydney** was forged and is still strong 49 years later in 2023.

Around the same time another very important fledgling relationship commenced with the **Port Macquarie Veterinary Hospital** which is also still in place to this day. Domestic animal veterinarians, with literally no experience of wildlife, were suddenly faced with a myriad of issues associated with the wild koalas rescued by the KPS. They liaised with Russ Dickens and the University of Sydney to try and treat these patients.

Most of the collaboration that occurred with universities, institutions, business, and community service groups came about through the sheer tenacity of **Jean Starr** herself. Jean may have appeared outwardly to be a gentle, timid quiet soul but in fact she was full of fire and determination to protect wild koalas. It didn't take people long when meeting Jean to discover that you "Don't

mess with Jean Starr when it comes to wild koalas!" Anyone who met Jean would not have imagined her chaining herself to a bulldozer about to knock down a forest of koala food trees, or standing up at a conference speaking about koalas, but, indeed she did all of this and so much more.

In 1978 a young veterinarian called **Paul Canfield** obtained a PhD in veterinary pathology from the University Sydney and began conducting necropsies on deceased koalas sent to him from the Koala Hospital. In 1982 he published the first document on koala diseases.



Early days - Dr Paul Canfield conducting an examination of an injured koala, assisted by Judy Dielman.

Royal honour for Port koala worker
 (By Carolyn Jeffrey) 12/6/85

A well-known and dedicated worker for the koalas in the Hastings was honoured on the weekend with an Order of Australia Medal.

Mrs Jean Starr has dedicated 12 years to the care and conservation of koalas in the area. Mrs Starr was elected president of the society at their first meeting in 1973 and has held the position ever since. Being a modest person, Mrs Starr is always quick to point out to the media that she is just one member of a large group of voluntary workers who pull an equal weight. Apart from myself in the founding organisation there were also Charles Upton, Rod Pierce, Steve Phillips a job ahead, as there was and Kevin Baker," Mrs Starr very little known about the animals," she said. "The society originated when Port Macquarie was

expanding and there seemed to be a sudden decline in the numbers of koalas. "We never realised that the society would have such a job ahead, as there was very little known about the animals," she said. "The society originated when Port Macquarie was

Cont. on page 3

12.6.85 P.M.N.

In 1987 Jean Starr was awarded an Order of Australia Medal for her dedicated service to koalas and wildlife preservation.

The University of Sydney began an official necropsy service for deceased koalas in 1980. The Koala Preservation Society supported koala research at the university by allowing access to koalas at the hospital and providing on-ground assistance. All the research Sydney University has done and continues to do is free of charge.

By 2008, 12 veterinarians completed University of Sydney PhDs or Master of Veterinary Science. All used samples supplied by the Port Macquarie Koala Hospital and their work became the foundation to understanding koala diseases and how to treat them which has been used throughout Australia and in international zoos.

Necropsy work conducted by Paul Canfield's team in the 1980s informed our understanding of the internal structural changes caused by the urogenital form of the disease **chlamydia**. Diagnosis of these changes was very difficult to determine in a live koala. **Radiography** (x rays) was used to pick up these structural changes, but it was costly as this was outsourced to Port Macquarie Veterinary Hospital (the Koala Hospital had very little money) and radiography was not always accurate. Other



methods used were simply sedating the koala and palpating the abdomen to “feel for structural changes” which was also rather inaccurate!

Antibiotics used to treat the chlamydia bacteria “appeared” to be effective in mild cases but not in more severe ones. Greater success was achieved in the ocular (eye form) of the disease using eye ointments prescribed for both humans and agricultural animals.

In the 1980s a domestic animal veterinarian, **John Fripp** worked at the Port Macquarie Veterinary hospital pioneering a radical **new surgical treatment** of the ocular form of the disease. It was considered very controversial for quite a long time but was so effective that it is still used today.



1980s from left to right, Jean Starr, veterinarian John Fripp and Jill Reid treating an injured koala.

Another wonderful partnership was developed in the 1980s (and still exists today) with a local human pathology company (now known as **Laverty Pathology and Vetnostics**) who agreed to analyse koala blood samples and chlamydia swabs for free. Over forty years this amazing company has been doing our pathology diagnostics free of charge.

In the early 2000s a young domestic veterinarian, **Chris Livingston**, joined the Port Macquarie Veterinary hospital team. He was enthusiastic about koalas and became extremely proficient at intubation of koalas for anaesthesia (koalas are tricky to intubate— that is accept us inserting tubes to deliver treatment.)

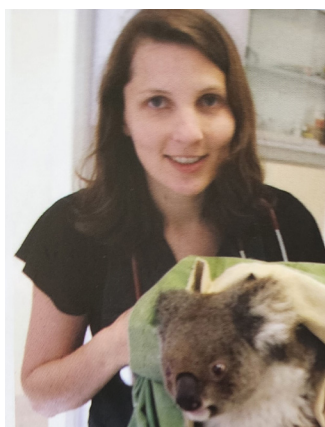
He began using external fixators to stabilize leg and arm fractures which was effective. He also tried several other procedures – such as cruciate ligament repairs. Chris Livingston now owns **Port Macquarie Veterinary Hospital** in partnership with Tim Reed both of whom still do surgical procedures

when required. A fine example of a relationship of more than 40 years’ duration.

More recent research

In 2005 our organisation entered what was to be the biggest wildlife research project in Australian history at that time. In partnership with the University of Sydney, the Australian Research Council, Australian Koala Foundation, and the drug companies Bayer and Pfizer we signed up for a **\$1.5 million dollar research project** (which was huge back in 2005) into understanding the effects of a few medications used to **treat chlamydia and other diseases**.

The PhD candidate was **Joanna Griffith** who spent several months each year for three years working alongside the Hospital Supervisor, Cheyne Flanagan, assessing, examining, and treating many koalas with various drugs. Joanna Griffith’s work changed the direction of koala medicine. Out of this work it was found that several drugs were metabolized by the koala’s “super liver” and eliminated before they were able to be effective. It was also found that the oral route of administration in most cases was also ineffective. The work in this area is still going on with the University of Sydney’s Pharmacokinetics laboratory (researching how drugs are utilised by koalas) headed by Professor Merran Govendir. The Koala Hospital also funded this laboratory for three years as it is such a vital service.



Left, 2005, PhD Candidate Joanna Griffith researched groundbreaking work on how koalas metabolized treatment drugs.



Right, Professor Merran Govendir, who now heads University of Sydney’s Pharmacokinetics laboratory research and was a presenter at the 2023 KCA National Koala Conference.

Dr Joanna Griffith remained at the forefront of research into koala diseases up until her sad and unfair passing from cancer a few years ago.

All this work enabled a change in treatment of the disease chlamydia and a number of other important illnesses, which resulted in medications being administered subcutaneously, into the muscle or even intravenously allowing for better absorption and higher levels in the blood. This was not without its own challenges as koalas are no different to anyone else in that daily injections of drugs could become a painful and distressing event.

The koalas' complex microbiome (the suite of bacteria and fungi that occupy the gastrointestinal tract) is beautifully designed to break down the eucalypt leaf compounds enabling the koala to absorb the essential nutrients. Unfortunately, drugs that are **effective at knocking down the chlamydial bacteria can also be incredibly harmful to the koala microbiome.** In 2023 even though koala medicine has improved immensely, **tackling this complex problem has still not been overcome.**

Since the year 2000 there have been some incredible changes at the hospital with an expansion into collaboration with several universities including **Federation, Melbourne, Murdoch, Macquarie, University NSW, Queensland University, University Sunshine Coast, Southern Cross, Griffith, Australian National University, University of Western Sydney and University of New England plus of course University of Sydney.** All of the work involved collection of samples for various research projects into koala diseases such as chlamydia, KoRV (retrovirus), cryptococcus, trypanosomes among others.

Treating bushfire victims

In September 1994 a fire developed on “Christmas Bells Plains” (later becoming Lake Innes Nature Reserve) resulting in approximately 100 koalas being brought to the hospital. Staff and volunteers had never dealt with burnt wildlife, nor had anyone else in Australia, so it was a major challenge. Koalas were treated using both human medications and “home remedies”. There are records of Lux Flakes (a flaky laundry powder) being used to bathe and soften burnt devitalized tissue which may seem a bizarre practice, but in fact it probably worked quite effectively. Many koalas survived and healed but many did not.

During the 2002 Lake Innes Nature Reserve burned again and there were over 100 koalas at the hospital in care (we were still admitting normal day to day patients as well as a huge number of burnt koalas).



1994, Koala Hospital search and rescue volunteers survey the bushfire devastation.



Bushfire victims. Koalas being cared for in Jean Starr's home.

One memorable day – eleven burnt koalas were brought into the old tiny, cramped clinic at the one time. That night, the intensive care ward was so full of fireground koalas we had eleven female koalas in baskets in Unit 1 alone, all feeding from a giant bin of eucalypt leaf in the middle. Next morning the one sub adult young male in there, must have found the whole exercise too much and was located asleep in the middle of the bucket of leaf.

Treating burns injuries in koalas has certainly improved greatly over the years, as we have gained enormous experience on what burns are treatable, and what are beyond help. It is an extremely complex and difficult area of veterinary medicine to work with – koalas can come in with minor burns injuries, appear to do well, then crash and die and others with more advanced burns, heal well and are released.



Since 1994, the Koala Hospital staff and volunteers have conducted search and rescue on literally hundreds of firegrounds on the mid coast of NSW, as well as being deployed to do search work in the Snowy Mountains and in 2009 attending the Black Summer fires in Victoria. The search and rescue teams collect any species of wildlife that is injured or in trouble on a fireground, not just koalas. As a result, the hospital has conducted more search and rescue of firegrounds than any other organization in Australia.

Lake Innes Nature Reserve went up in flames again in 2019 with the same ferocity as 2002 and 1994. In 2019, despite us repopulating Lake Innes Nature Reserve with around 40 juvenile koalas post 2002, the numbers of koalas located in 2019/20 were considerably less.

The 2019/20 megafires (preceded by a 10-year long drought period) were the **worst fires in recorded history** from a wildlife and habitat perspective. Unfortunately, there were fewer burnt koalas admitted into care this time at the hospital despite larger numbers of search personnel, having the use of EWPs (elevated work platforms) for capturing injured koalas and taking more koalas from other regions of the state. This was to be expected due to the decline in koala populations from both earlier heat events and removal of habitat through human development. Sadly, the messages in the media back in the 70s through to the 90s stating that “we are losing our koalas” has made no difference to reversing this decline in 2023.

The amount of local, national, and international media attention that the Koala Hospital received during the 2019/20 fires certainly highlighted not only how much the public love koalas but how much support there is for their conservation.

Dog attacks and motor vehicle accidents

Koalas presenting because of **dog attack injuries** were another disheartening problem for the staff and volunteers who couldn't understand why most koalas died despite having minimal external injuries. Other dog attack patients were admitted extremely unwell, moribund, and dying shortly afterwards with no visible injuries at all which was a total puzzle. The bodies were always shipped to University of Sydney who sent back postmortem results saying, “dog attack”.

It wasn't until 2001, when necropsies began to be conducted at the Koala Hospital itself by the Hospital Supervisor, Cheyne Flanagan, under the

initial guidance of the University of Sydney, that a much better understanding was achieved. Some koalas were dying despite no apparent external injuries because all the trauma was to the internal organs and in most of the cases major internal bleeding. This literal hands-on exposure was a game changer for the Koala Hospital.

Conducting necropsies on any koala who dies remains an integral and routine part of hospital work. It has enabled us to understand so much more to then be able to help live koala patients, educate our volunteers and to inform the public.

Koalas presenting at the hospital with motor vehicle impact fractures from the 1970s to the end of the 1990s were treated using either bandaging techniques that immobilized the affected limb or where possible had internal plating done. Both procedures did not always have successful outcomes.

From 1973 to 2000 there was a lot of trial and error in finding successful ways to treat rescued koalas.

Commonly, to rehydrate koala patients, human baby formulas were used, and small rubber tipped “droppers” administered these fluids. In the early 2000s there was a shift away from this to a rehydration formula manufactured to suit both domestic and native animals along with administration via syringes. Nonetheless, at the time, these “milk” formulas were of great value for rehydration and supportive nutritional supplementation. Rehabilitation of wild koalas in care is an evolving dynamic - many methods once used are no longer utilized and, in some cases, there is a return to older methods.



Early feeding experiments in 1970s.



Jean Starr, Jean Le Page and Jill Reid caring for koalas in 1980s.

Understanding wild koala behavior was probably not a priority in the early days and a change in thinking has only become important in the last two decades. This innocent but caring naivety was evident in old photos showing adult koalas being carried round, patted, and cuddled which was considered an acceptable method when working with these wild animals. As good observation science has shown - koalas are cryptic in their behavior and tend to hide how they are feeling so over the last two decades we have learnt to handle and work with these wild animals in a totally different way. We now keep our distance and physical contact occurs only for capture, examination, treatment, and release.

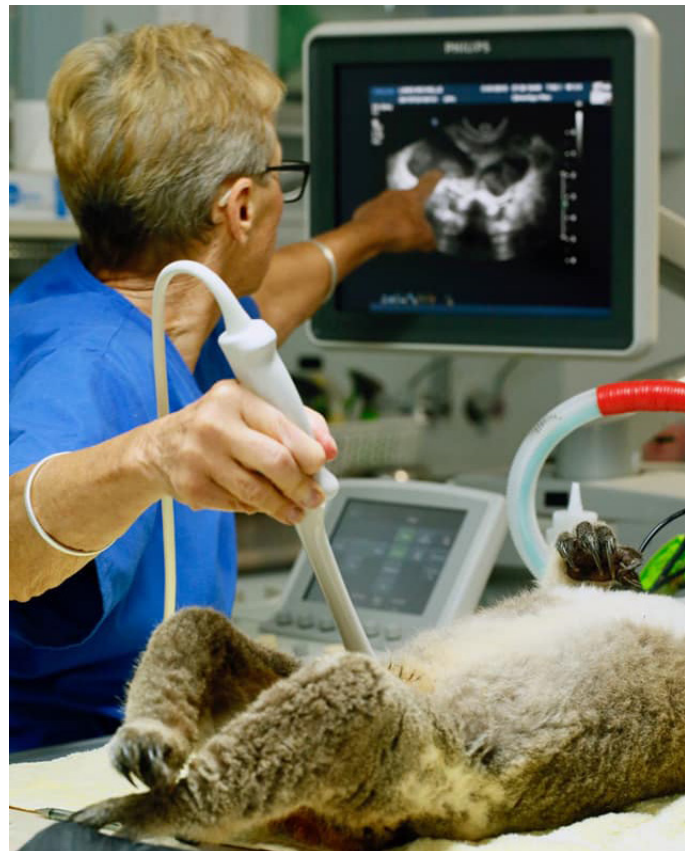


2018 Clinical Director Cheyne Flanagan and Assistant Clinical Director Scott Castle using more contemporary treatment procedures.

KCA veterinarian Shali Fischer, KCA volunteer Gaby Rivett and Taronga Zoo veterinarian nurse Elizabeth McConnell anaesthetising an injured koala for treatment.

More modern diagnostic instruments assist developing treatments.

At the end of the year 2000, another major game changer occurred with **sonography** being introduced by the Hospital Supervisor as an on-site diagnostic tool. Local diagnostic imaging companies donated quality serviced human ultrasound machines. They also provided on-site training and technical support. Over the years these machines have been upgraded - a portable laptop ultrasound for field work was donated by Forestry Corporation NSW in 2016, and during the 2019/20 bushfires, Phillips Australia donated an excellent and very versatile ultrasound which is in constant use today.



Cheyne Flanagan (KCA Clinical Director) using ultrasound equipment.



The Gunnedah experience

In January 2009, the NSW RSPCA Inspectorate contacted the Hospital Supervisor seeking advice regarding several captive koalas being held in a “difficult situation”. Action was taken in early February 2009, with the RSPCA engaging the KPS Koala Hospital Supervisor, a veterinarian from Taronga Western Plains Zoo, one NPWS ranger and three RSPCA NSW Inspectors, to visit a wildlife park outside of the town of Gunnedah to deal with many koalas and several other species of wildlife that were housed in suboptimal conditions.

A film crew from RSPCA Animal Rescue also attended. All involved were on site for many hours and at the end of the day nine koalas were seized along with some lizards and housed overnight away from the wildlife park. The koalas were taken the following day to the Port Macquarie Koala Hospital for assessment and treatment and were held for almost six months.

Never in the hospital’s history had we ever experienced or seen so much vitriol and “trial by media” towards RSPCA’s important work and repercussions towards the Koala Hospital. All this culminated with a NSW Parliamentary Inquiry into RSPCA’s dealings on that day. Ultimately the RSPCA was cleared of any wrongdoing. The staff and volunteers at the Koala Hospital acted in the most professional manner with quiet dignity and respect throughout the whole ordeal which is something of which we should all be proud.

Education

As part of the KPS efforts to save koalas they began to educate the community and school children. This early newspaper cutting shows Cath Le Page speaking to children about caring for sick and injured koalas. Note that she is carrying ‘Stuffy’ still our much loved demonstration koala.

In 2004 the Hospital Supervisor, Cheyne Flanagan, began teaching koala rehabilitation to other organisations throughout NSW and by 2007 this had expanded to Victoria as well. Out of all of this, the first Koala Rehabilitation Manual was published in 2006 and was sold throughout Australia and internationally to zoos in Europe and the USA. This rehabilitation manual is now in its 6th published edition.

At the same time in 2004, the Koala Hospital also began presenting at various koala and wildlife conferences throughout Australia, which is still occurring today.

In 2014 the Clinical Director (title change from Hospital Supervisor) was requested by the Wildlife Information, Rescue and Education Service of NSW (NSW WIRES) to commence teaching Koala Rehabilitation workshops for both WIRES and other licensed koala groups in NSW. This was done as a one day theory session which was held in the auditorium of the NSW University’s Rural Medicine campus in Port Macquarie and then a half day practical at the Port Macquarie Koala Hospital.



Cath Le Page 1987 delivering educational talks to school children.



Cheyne Flanagan demonstrates koala post-mortem for students.

This was no mean feat, having 100 students at the Koala Hospital! During Covid these face-to-face workshops changed to an online zoom training course comprising of six weeks of two hours per week. In 2023 we put together an extensive webinar series as an online Koala Rehabilitation Course which is now available on our website for students wishing to enroll.

Koala Hospital National Conferences

In 2013, the Koala Hospital hosted and ran, the **world's first National Koala Conference** in Port Macquarie with speakers applying from across Australia and internationally. This was a highly successful three-day conference and was followed by another highly successful three-day conference in 2017 and our most recent successful three-day National Koala Conference held in Port Macquarie in 2023.

Our clinic now

In 2021, the clinic progressed further in employing two enthusiastic young veterinarians to run the hospital, which has been yet another game changer. Both Shali Fischer and Astrid Van Aggelen bring veterinary experience and lots of initiatives to improve the quality of koala care, including onsite radiography, onsite pathology diagnosis plus a strong research interest. We look forward to the next chapter with them!



KCA Veterinarians Shali Fischer and Astrid Van Aggelen.

The final ingredient in this story is to give praise to both the amazing volunteer teams and the employed staff who have cared for literally tens of thousands of koalas since 1973. Along the way there have been many successes and many mistakes made, and much has been learned from them and the wild koalas of this country have benefited from the experience and dedication of these wonderful people who have given so much over 50 amazing years.

Two OAM honours for KCA pioneers

Koala Conservation Australia is proud that two of our dedicated pioneers, first Jean Starr in 1987 and now Cheyne Flanagan, have been recognised with Order of Australia medals by the people of Australia for their incredible work.



Cheyne Flanagan holds her 2023 Order of Australia Medal.



A Koala Hospital volunteer and our long-time koala home carer, Barbara Barrett giving medication to a rescued koala.



COLLECTING FOUNDER KOALAS FOR THE WILD KOALA BREEDING PROJECT - UPDATE



SIMONE GARWOOD

How they are being collected

Following consultation with key stakeholders and further surveys of population densities by University of Newcastle, Koala Conservation Australia is commencing to collect founding koalas to establish an ex-situ koala population for the purposes of koala conservation.



Left: Wild Koala Breeding Project manager, Simone Garwood, building finishing sections for the koala yards.

Right: KCA Koala Keeper, Clare and partner Nic finalise additions to the breeding yard gunyahs.

Founder koalas are being sourced across a range of the mid-coast genetic cluster, focussing on the Hastings-Macleay, Kempsey and Taree regions. Collection will occur via three separate sources.

These are:

- **Rehabilitation.** Koalas that have been admitted to the Port Macquarie Koala Hospital for treatment of health or displacement issues and the koalas are disease free.
- **Known high risks areas.** Koalas in locations that receive call outs for koala rescues or in areas that experience koala mortality at least twice monthly. It also includes locations identified via hospital admissions data, community reports through call outs and through the Port Macquarie-Hastings Council Collector app.

- **Healthy Populations.** Koalas locations which have been surveyed and assessed to contain more than 1 koala every 25 hectare. This threshold has been developed considering density estimates and classifications by Rhodes et al (2015) for koalas in South East Queensland.

To minimise potential impacts

- Collection is occurring within 12 months of population monitoring being conducted.
- No more than 10% of the total population estimate will be removed.
- An annual five km radius 'no collection' buffer will be employed unless separated by a significant geographic barrier (such as a river or highway).
- Koalas around the age of dispersal (greater than 2 years of age) will be prioritised over resident adult koalas to reduce impact on social structure of the population.

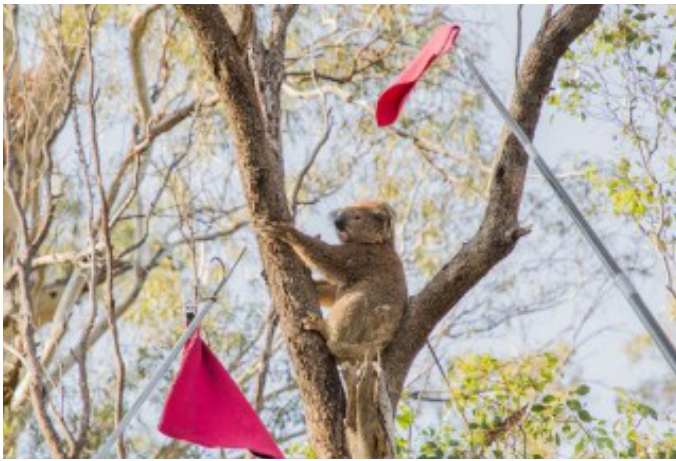
Capture and Handling

Staff at the Port Macquarie Koala Hospital have extensive experience in koala care, and handling is being restricted only to essential procedures. All capture and handling techniques will follow the NSW Best Practice Guidelines for the use of Koalas in Scientific Research (2020).

A flagging technique will be utilised to encourage koalas down from their perch (DPIE, 2020). These are lightweight extendable poles with a towel on the end. Koalas naturally will move down away from the flagging pole. Trees climbers experienced in koala capture may be employed if trees are too tall for a pole.

Once the koala is at shoulder height a catch bag will be positioned below it and the koala to move in to the bag. Canvas bags are used to ensure the koala is not able to injure itself and as it is dark, it will allow for a degree of comfort and security.





Koala Capture Flag Method (George Madani, Best Practice Guidelines for the use of Koalas in Scientific Research. DPIE 2020.)

If a koala is too high for a flagging pole to reach, the portable koala trap method is being used instead (Philips, 2011). Traps are made by constructing temporary barriers approximately 2-3m out from a tree containing a koala. The barriers funnel to a single exit in to a cage trap (unbaited) which is opened at dusk until dawn and closed during daylight hours. Once in the trap, the koala is encouraged in to the bag.



Portable koala trap method (George Madani, Best Practice Guidelines for the use of Koalas in Scientific Research DPIE, 2020).

Transport

Koalas are transported in a padded temporary transport crate. Transport crates can consist of two laundry baskets joined. The container is then covered with a sheet to provide a dark environment to minimise stress. The container is secured inside a dedicated koala transport and accompanied by a PMKH staff member and monitored closely. They are then being transported to the new WKBP facility at Guulabaa, where they are being placed into quarantine and undergoing health checks before settling into their new home.



Koala transport containers



Volunteer De Castle and KCA Conservation Manager Scott Castle in Q6, one of the quarantine enclosures at the WKBP yards.



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THE FUTURE...

SUE ASHTON

What does the future look like for Koala Conservation Australia? From humble beginnings as a one room operation to the facility it is today, our future looks promising.

With 14 intensive care units, two vets, a vet nurse, koala care, rescue and maintenance teams and over 200 volunteers all directing their energy towards caring for sick and injured koalas and to wild koala breeding we will be guided by our four strategic pillars into the future.

Koala Care

While the rescue, veterinarian care, rehabilitation and release of koalas will remain the focus of the Koala Hospital, a **new breeding centre** aims to move koala conservation to a higher level. Increasingly our talented vets are undertaking research into diseases, nutrition, care and husbandry practices with institutions and independently, to improve our knowledge and care of this vital species. Through relationships with other wildlife organizations, we continue to share knowledge and research, all aimed at improving the care and treatment of wild koalas.

Koala Conservation

With predictions that wild koalas will be extinct in NSW by 2050, just 27 years away, Koala Conservation Australia (KCA) has accelerated its breeding program. Partnerships have been formed with Taronga Conservation Society, University of Sydney, the Australian Museum and the University of Newcastle focusing on koala conservation and now a facility is being built to accommodate breeding koalas.

The breeding program

Government approvals for animal welfare and ethics, licences to collect and to release wild koalas, scientific sampling permits, fieldwork protocols, and quarantine times, have been obtained and the program will commence in October 2023, with the collection of 'founders', koalas for breeding.

Once collected, the koalas will be quarantined for 21 days, health checked and behaviourally assessed to make sure they are fit and well enough to breed. When suitability has been determined, the

koalas will be housed in large, new enclosures and will be given the opportunity to mate when the time is right.

The research program will be carefully documented as KCA develops a koala breeding 'how-to' map for other wildlife groups and areas in NSW.

None of this would have been possible without the generous backing of the Australian people, and koala supporters worldwide, who kindly donated over \$7million during the terrible bushfires of 2019. KCA has added to this funding and built a world-first facility that will hopefully stem the dark prediction of koala extinction.

Leadership and Collaboration

Partnerships with individual landholders, institutions, businesses and other wildlife organisations remains a priority for KCA. By collaborating with individuals and other organisations we are meeting our conservation goals to preserve koala habitat.

KCA's partnership with National Parks and Wildlife Service in the **purchase of land at 147 The Ruins Way, Port Macquarie**, has moved from acquisition (KCA contributed over 50% to the purchase) to regeneration of this valuable site. This land will now be held in perpetuity as a national park for wildlife to live in and for people to enjoy.

Sustainable Business

Our biggest challenge remains improving KCA's systems and processes to help manage relationships with our volunteers, staff and our supporters.

The formation of several committees to advise the Board will contribute to decision making, ensuring KCA moves forward in the best and most appropriate direction as it expands and improves its business model, with employees in management roles to guide the process.

The future is bright for KCA.



KCA Volunteers, staff and long-time supporters celebrate KCA's 50 year anniversary at the Koala Hospital.



Adopt Daisy today and help us tell more great success stories

Allunga Ave Daisy has been released back to the wild! Another successful rescue and rehabilitation of this precious iconic species.

We love what we do and it is more important every day that we keep doing it! We need your support!

ALLUNGA AVE DAISY

Hello,

My name is Allunga Ave Daisy and I was found on December 6th 2022 and I only weighed 1.5 kgs.

Rescuers from the Port Macquarie Koala Hospital went to look for me when my mother was found drowned in a pool.

I went into home care with one of our experienced carers and progressed really well and within the space of 10 weeks I had put on 1.1kgs and reached 2.6kg on the tenth of February 2023.

I did not return to home care and instead was put into the joey pre-release yard with another joey, Granite Street Peter.

Peter and I quickly adapted to each other's presence and we happily shared the tall tree in the joey enclosure where we practiced climbing skills until we were old enough to be released in a safe site.

In 2023 they tried to release me but I wasn't quite ready so I went back to a carer until I gained some strength and was released on the 5th September 2023.

It is only possible for me to be wild and free because of the love and support of Port Macquarie Koala Hospital and generous supporters like you!

You can Adopt me today and help Koala Conservation Australia in the very important work they do.

love  ALLUNGA AVE DAISY



24 HOUR KOALA EMERGENCY RESCUE LINE – 02 6584 1522

If you sight a Koala call us.

Also check the website Contact Us | Koala Conservation Australia Ltd

(koalahospital.org.au) for your questions.

Or Email: info@koalahospital.org.au



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