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SAVE THE TASMANIAN DEVIL.

SAVE THE TASMANIAN DEVIL PROGRAM

FREE NEWSLETTER

TROWUNNA DEVILS JOIN INSURANCE POPULATION

The Tasmanian devils at Trowunna Wildlife Park have been incorporated into the Save the Tasmanian Devil Program's Insurance Population, helped along by a $105,000 grant to build a secure, double-fenced area within the northern-Tasmanian facility.

The grant is part of the Tasmanian Devil Conservation Grants scheme that was established by the Program in 2009, and is administered by the Zoo Aquarium Association's Wildlife Conservation Fund.

Androo Kelly, the owner/operator at Trowunna, said the incorporation of the park's devils into the Insurance Population reflected their long-standing commitment to the species.

"We've been breeding devils since 1985 under studbook conditions," he said. "This year we have achieved 11th generation captive-bred devils, which is rare for any breeding program. Trowunna is recognised internationally as a heritage population of devils – unique and vital for this species.

"An added bonus is that many of our devils originated in the east of the state. The eastern devils are slightly different genetically to the western devils, which currently make up a large percentage of the Insurance Population."

Another feature of the Trowunna devil population is that Androo has successfully bred a homozygous AC5 (Ancestral Chromosome 5) devil. This is something the Program has not seen before.

Why is this AC5 animal important? It has the same chromosomes as its ancestors had about 13,000 years ago, before an evolutionary change in devils occurred (in particular, with the AC5 becoming PiC5, which is what nearly all modern devils have).

"This AC5 animal is like a throwback to what devils were like thousands of years ago," Androo said. "The AC5 animals may be less susceptible to cancers than the species is today.

"We've been working closely with Anne-Maree Pearse (from the STDP, Mt Pleasant Animal Health Laboratory) and she is researching when and why devils became susceptible to cancers like the Devil Facial Tumour Disease (DFTD)."

In 2006 two Trowunna devils were sent to Denmark by the Tasmanian Government to celebrate the birth of Prince Christian, the son of Crown Prince Frederick and Tasmanian-born Crown Princess Mary. Several months later, a case of DFTD was discovered within the Trowunna population.

"This discovery really knocked everyone involved with Trowunna," Androo said.

"We've always prided ourselves on the natural setting of our park and we were doing a lot of rehabilitation work too. Still, it's a mystery how the disease got into the park.

"Today, five years down the track, we're confident we've managed DFTD out of the population. So this is a good-news story. Our devils are now officially in the Insurance Population, and they will provide their key genetic benefits to the wider Insurance Population."

FROM THE MANAGER'S DESK

Threatened Species Day events were supported by the Save the Tasmanian Devil Program across the nation earlier this month. The 7th of September was chosen for the annual Threatened Species Day in commemoration of the death of the last known Tasmanian tiger (Thylacine), which occurred in a Hobart Zoo in 1936.

But it's chilling to think that in the 75 years since that very sad event, almost 200 native animals and plants have been added to Tasmania's endangered list. Within the Program – in fact across the community as a whole – there's a determination that the Tasmanian devil doesn't go the same way.

The latest annual spotlighting figures included in this issue of the newsletter confirm what we already knew: the Devil Facial Tumour Disease (DFTD) continues to reduce populations across the State. But it's interesting to note that devil numbers in the north-west, where we haven't recorded any evidence of DFTD, have actually increased. What's more, the population in the far north-east (where DFTD was first observed in 1996) continues to tick over. To date we haven't witnessed any local extinction as the population in that region, it would seem, manages to hang in there.

We're also encouraged by the continuing growth of our Insurance Population, which is being held at public and private wildlife parks and zoos across every Australian state (of course, including Tassie). The Insurance Population, which we manage in partnership with the Zoo and Aquarium Association, is predicted to reach 500 animals this year. That's well ahead of the targets set back in 2006.

Keeping devils functioning in the Tasmanian landscape is still a priority for the program. Over the last two years we have taken major steps towards achieving that. We now have over 50 individuals in Free Range Enclosures within Tasmanian and more planned over the coming months. Work is well underway on a number of other projects which will result in as many as 500 devils being protected from DFTD behind fences and on Islands over the next 12 months.

We are also looking into a variety of barriers which can be used to enhance the natural landscape features to slow or better still prevent the spread of the disease into healthy devil populations; if we can do this before the disease arrives we will have gone a long way towards maintaining devils in the Tasmanian landscape and avoiding the ecological consequences resulting from a loss of Tasmanian devil.

On the eve of threatened species day we received some fantastic news, a team of researchers from the Save the Tasmanian Devil Program, University of Tasmania, Griffith University, the University of Sydney and the Menzies Research Institute – known as the Devils' Advocates – has won the 2011 Sherman Eureka Prize for Environmental Research. Sherman Eureka Prize for Environmental Research is awarded for research in any field of the biological, physical, mathematical or biomedical sciences leading to the resolution of an environmental problem or the improvement of our natural environment.

In addition to acknowledging the efforts of the Devils Advocates I would also like to congratulate and sincerely thank someone who has, over the last five years, worked extremely hard and without recognition to bring news of the devil and the program to the public, Janette Brennan. This will be Janette's last Devil Newsletter. Janette has been the driving force behind the writing and publication of the Devil Newsletter since the first edition back in March 2006.

Since coming to the program I have been constantly amazed at the energy, enthusiasm and patience she brings to her job and how she always manages to get a great newsletter out despite having a Program Manager who often asks for a last minute change or addition. Thank you for everything you have done over the last five years Janette, we will all miss having you involved in the Program. We have some big shoes to fill.

ANDREW SHARMAN
Manager
Save the Tasmanian Devil Program

THE STORY SO FAR...

Tasmanian devil numbers have declined by approximately 84% since the Devil Facial Tumour Disease (DFTD) was first observed in 1996.

DFTD is a new, transmissible cancer that kills all infected devils. It produces small lumps in and around the mouth, which develop into large tumours on the face and neck. Death follows as a result of starvation and the breakdown of bodily functions.

It is believed that DFTD is transmitted from animal to animal through biting. The foreign cells of the tumour aren't rejected by the individual animal, in part due to a limited genetic variation within the population and in part due to the nature of the DFTD cancer cells.

The disease front has moved in a south-westerly direction across more than 60% of Tasmania, although there's no evidence that it has yet reached the far north-west.

The Tasmanian devil is listed as 'Endangered' under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* and the Tasmanian Government's *Threatened Species Protection Act 1995*.

The Save the Tasmanian Devil Program is the official joint strategy of the Australian and Tasmanian Governments. It features captive and free-ranging Insurance Populations, and collaborative laboratory-based investigations of DFTD.

UPGRADES FOR 'DEVILS @ CRADLE'

Construction work to upgrade the animal husbandry infrastructure at the 'Devils @ Cradle' Tasmanian Devil Sanctuary began in July 2011, funded by a $30,000 Save the Tasmanian Devil Program (STTDP) Project Grant.

'Devils @ Cradle' is a unique wildlife park in that it concentrates on carnivorous marsupials – specifically Tasmanian devils and quolls. Since 2006 it has aligned its operations with STTDP priorities and, in January 2011, it became an official part of the Program's nation-wide Insurance Population (which is overseen by the Zoo and Aquarium Association).

Wade Anthony, the managing director of Devils @ Cradle, said the Project Grant upgrades will allow keepers to care for the animals in a more efficient manner.

"One factor surrounding the management of our Tasmanian devil population is the location," he said.

"We're based in an alpine environment, on the edge of the Cradle Mountain National Park. It's a truly magnificent place, but the weather is sometimes inclement and that causes some difficulties in managing our animals.

"So these facility upgrades will greatly assist the keepers in caring for the animals in this environment."

The funding from the Project Grant will allow 'Devils @ Cradle' to:

- Improve food storage and preparation areas for the animals daily dietary requirements;
- Upgrade the keepers' work area to provide an undercover station for veterinary work, as well as the daily management of devils; and
- Initial site works for the development of additional devil enclosures.

Project Grants are funded by public donations to save the Tasmanian Devil Appeal. The facility upgrade works at 'Devils @ Cradle' were due to be completed by the end of last month.

DEVILS OF THE ALPINE

It appears that no more than 10% of the devil population at Cradle Mountain has been affected by the Devil Facial Tumour Disease (DFTD) in the five years since a case was first observed in that region, a private Field Monitoring Project has reported.

The remote-camera study, titled Devils of the Alpine, was prepared by Wade Anthony, the managing director of Devils @ Cradle. It features data from more than 5,000 photographs, as well as records from spotlighting, roadkill monitoring, and general observations on Wade's alpine property (based on the edge of the Cradle Mountain/Lake St Clair National Park).

"In late 2005 a roadkill DFTD devil was picked up on the Cradle Mountain Road," Wade said.

"Given what we'd been told about DFTD up to that point, the future looked bleak for the local population. But in the five years since then, the population has appeared dynamic and healthy, with very little sign of DFTD. In fact it's been close to two years since we've seen a diseased devil."

Alpine devils from Devils @ Cradle Tasmanian devil sanctuary. Photograph by Mark Walsh.

The Cradle Mountain rate of disease prevalence is surprisingly low, given that devil numbers across Tasmania have declined by 84%.

"During the five years of recording data on devil numbers, the project has identified an estimated 150 individual devils of all age structures, from juveniles to five-year-olds," Wade said.

"It appears the disease arrived, moved through, and is having little impact.

"Are these Cradle Mountain devils showing an inherent resistance to disease or is the changing environment a factor – or maybe even a combination of both? I'm not completely sure. But I do know that any sign of a fight-back from the species is great news indeed."

DEVILISH FOLK

The diversity of expertise among members of the Save the Tasmanian Devil Program plays an important role in furthering our knowledge. This issue we hear from ***Jocelyn Hockley****, the head devil keeper within the Captive Management and Translocation Section.*

I hand-raised my first orphaned kangaroo when I was five years old. My family was part of the local wildlife rescue and if anyone came across an injured or orphaned animal, they brought it to us. Of course we still had cats and dogs, but pets to me also included owls, snakes, sugar gliders and hopping mice. So my current career in wildlife, most people would probably say, was inevitable.

I grew up on the central coast of NSW and did my first work experience at the Australian Reptile Park in Gosford. Since then, I've been a bit of a gypsy – travelling as far north as Port Douglas to work in a private wildlife park before moving down to Healesville Sanctuary in Victoria. Over the following eight years I worked in their endangered species section and then their animal hospital.

My time at Healesville reinforced in me the value of wildlife education. I think it's great that Aussie kids these days are introduced to native animals at a young age. When I was a kid, schools taught about lions and elephants. But kids these days are more aware of our environment – not necessarily

Jocelyn Hockley.

becoming little environmentalists, but just being aware, for instance, of the impact on animals if you throw your rubbish out of the window. My family had given me a real passion for wildlife, but I think kids today are much more aware than we were.

Anyway in 2008, I heard about this job as head devil keeper with the Insurance Population. It provided a new challenge. And I thought that one day, when I'm at the end of my career, I might be able to look around and see that the devil is still alive and active in the Tasmanian landscape, and that I had something to do with it.

This year our Devil Insurance Population will probably reach a total of 500 devils. These disease-free animals could play an important role, if ever needed, in helping to re-establish healthy wild populations in Tasmania. As well as relationships with wildlife parks in Tasmania, the Insurance Population features partnerships with sanctuaries and zoos in just about every mainland Australian State. I'm proud to say that I still have friends at many of these parks from when I used to work at them.

The Insurance Population is one of the best collaborative programs that I've worked on. For me, it's just the best thing to see all these people around Australia, both in private parks and public zoos, working together for one iconic Australian species – the Tassie devil.

OPENING OUR EYES TO ROADKILL

If you've ever been in a vehicle on a Tasmanian road – or you plan one day to travel on a Tasmanian road – then you too can help to help save the Tasmanian devil.

The Save the Tasmanian Devil Program's Roadkill Project was launched in 2009 to determine the impact of roadkill on devil populations, and to educate motorists about the simple measures that can reduce the likelihood of roadkill.

But we need your help! We'd like to encourage you to keep a supply of Reply Paid report forms in your glove box (they can be downloaded at www.tassiedevil.com.au). When you see a road-killed devil, fill out a form and drop it in the nearest mail box. You can also fill out an online form at the same website, or call or SMS a photo and location information to 0427 733 511.

Devils are the most difficult animals to see on the road at night because of their dark colouring. A recent study suggested that to be able to see a devil and stop in time, a driver would need to be doing no more than 40kmh. Most people travel about twice that speed on our country roads.

We're also interested in devil roadkill in areas west of the Murchisson Highway – the area in which DFTD has not been recorded. If you spot an injured or dead devil on the road in this region, we'd ask you to immediately report it.

But please, always remember safety first. Never put yourself or others in danger when collecting roadkill information, and never touch roadkill.

UNLOCKING SECRETS OF THE DISEASE

The secret behind the spread of the Devil Facial Tumour Disease is due to more than just a lack of genetic diversity within the species, research published by scientists working with the Save the Tasmanian Devil Program has revealed.

DFTD is a transmissible cancer that is spread from animal to animal through biting. Previously, it was hypothesized that the foreign tumour cells weren't rejected by an individual animal because of the lack of genetic variation within the Tasmanian devil population.

But Associate Professor Greg Woods, from the Menzies Research Institute Tasmania, said the latest research suggests that DFTD is more the fault of the tumour than the devil.

"The unique ability of DFTD to hide from the devil's immune system is intriguing and baffling," Greg said.

"We know that a lack of genetic diversity is part of the reason, but we were keen to test the severity of this limited diversity – and the simple way to do this was through skin grafts."

Skin samples from healthy devils were grafted on to other devils. The theory was that if the grafts would take, then those devils must be very genetically similar.

But all five of the successful skin allografts were rejected within 14 days of surgery. Greg said this result indicated there is enough genetic diversity within the species to produce a protective immune response.

"That result brings us back to the tumour," Greg said. "What is special about the tumour cells that they can avoid rejection by the host devil?

"A lack of genetic diversity is still part of the answer, but there must be something else. Something is missing from those tumour cells."

The paper, titled 'Allorecognition in the Tasmanian devil (Sarcophilus harrisii), an Endangered Marsupial Species with Limited Genetic Diversity', was published last July in PLoS ONE. It's available online at: http://dx.plos.org/10.1371/journal.pone.0022402

ITCHY AND SCRATCHY

At first it seemed like a simple procedure! Researchers wanted to graft a sample of skin – no bigger than a five-cent piece – from one Tassie devil to another. In doing this, they hoped to test the immune response genes of the species.

"What we didn't realise was that devils can scratch every centimetre of their body," explained Associate Professor Greg Woods, from the Menzies Research Institute Tasmania.

"So the first skin grafts were completely scratched away. In the end our 'simple procedure' became a technique that involved elaborate bandaging skills, and the assistance of a plastic surgeon."

Thankfully Royal Hobart Hospital plastic surgeon, Mr Frank Kimble, was available to help. He brought out all of his equipment, as well as years of expertise, and operated on the animals in a field hospital.

"It has been a great honour to be involved in this important research," Frank said.

"Undertaking these procedures on the devils was quite difficult and one of the hardest aspects was getting the devils to keep their dressings on, just like working with some of my paediatric patients.

"This work certainly demonstrated to me the complexity of both the devils and the DFTD."

SCIENTIFIC SUPPORT

ADVISORY COMMITTEE APPOINTED

A Scientific Advisory Committee (SAC) was appointed last July to provide advice and scientific support for the activities of the Save the Tasmanian Devil Program.

The broad role of the SAC will be to assist the Program with the development of science strategy and projects, evaluate the quality of science in the program, and to provide advice on the capability required to support the program.

The advisory committee is chaired by Professor Chris Johnson, the Professor of Conservation Biology at University of Tasmania.

Dr Chris Boland, the Science Manager of the Save the Tasmanian Devil Program, said Chris Johnson's research interests, expertise and experience are a perfect fit for the needs of the Program.

"The committee also has a broad range of world-class experts from Australia and around the world," Chris Boland said. "They cover all of the major aspects of devil conservation.

Professor Chris Johnson, Chair of the Scientific Advisory Committee.

"It really is an extremely impressive group of individuals who will have fresh perspectives on devil conservation."

Joining Chris Johnson and Chris Boland on the Scientific Advisory Committee are: Emeritus Professor Dick Frankham (Macquarie University); Dr Brendan Wintle (University of Melbourne); Dr David Choquenot (Landcare Research New Zealand); Dr Lee Skerratt (James Cook University); Dr Dan Tompkins (Landcare Research New Zealand); Dr Sarah Legge (Australian Wildlife Conservancy); Professor Chris Goodnow (John Curtin School of Medical Research, ANU); and, Dr Menna Jones (University of Tasmania).

WHO WE ARE

The Save the Tasmanian Devil Progam is the official response to the threat of DFTD to the survival of the Tasmanian devil.

The Program is a joint initiative of the Australian and Tasmanian Governments in partnership with the University of Tasmania.

CAN MICRO-BIOLOGY SAVE DEVILS?

Microbiology could hold the key to discovering a solution to the spread of Devil Facial Tumour Disease (DFTD), a Save the Tasmanian Devil Program workshop in Hobart heard last July.

Microbiology is the study of microorganisms – tiny living things that can only be seen through a microscope. This area of study, combined with previous research into tumour biology, could be crucial in the recovery of the species, said keynote speaker Professor Stephen O'Brien, from the US National Institute of Cancer.

"We're hoping the experience we've had with tumour biology will be relevant to the design of a strategy for protecting devils against this disease," he said.

The objective of the recent workshop, titled *Can microbiology save Tasmanian devils from an immortal, parasitic and contagious cancer?* was to spark robust discussion about key management and research actions that could assist in the recovery of devils. Science manager Dr Chris Boland said it was also a chance for the Save the Tasmanian Devil Program to tap into the collective expertise of leading microbiologists from across Australia and around the world.

"In the face of a unique and rapidly-evolving disease, this will require the latest techniques in conservation genetics, cancer research and vaccine development," Chris said.

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