

# Wildlife Health in Australia



Newsletter of the Australian Wildlife Health Network

Volume 8, Issue 4

December 2010

## Message from the Chair

**DR. LYNDEL POST,**  
**Office of the Chief Veterinary Officer**



AWHN provides support for a number of specialist groups that provide advice to Australian governments, and agencies and organisations with a key interest in wildlife health. One of these specialist groups is the Zoo Animal Health Reference Group (ZAHRG).

The ZAHRG directly advises the Australian Chief Veterinary Officer (ACVO), particularly on emergency disease preparedness issues of concern to both governments and the Australian zoo industry. Membership of the group is by invitation from the ACVO. ZAHRG members represent each of Australia's major zoos, the Zoo and Aquarium Association (ZAA), DAFF, and Department of Primary Industries Victoria. AWHN provides secretariat and administrative support.

A delegate of the ACVO participates in ZAHRG activities; I currently represent the ACVO on the group and find the interaction and discussion valuable. ZAHRG liaises with the ZAA Executive Director, the ZAA Board, the ZAA Veterinary Specialists Advisory Group and with the zoo industry.

Important activities during the last two years have been:

1. The development of a protocol for the use of vaccine in zoo birds during avian influenza emergencies. During the development of the protocol the group liaised with the National Avian Influenza Vaccination Expert working group that advises Australia's CCEAD and AHC.
2. The development of an Australian Zoos Biosecurity Manual for the zoo industry. The manual aims to provide clear advice and guidance to minimising disease spread into, within and out from zoos,
3. An assessment of the role of Australian zoos in national animal disease surveillance. ZAHRG considered that those zoos with appropriate resources and systems should become more actively involved in surveillance activities. The Group worked with AWHN and ZAA to develop an integrated, national zoo-based wildlife surveillance program. Information from a trial of the zoo surveillance program is included in the national wildlife health information system, NeWHIS. The trial is supported by funding from ACERA and will be assessed at the end of this year.

Recently ZAHRG recommended that the ZAA Regional Industry Liaison Officer (ILO) and a representative of small zoos be invited to join the group. They also

recognised the importance of representation of the views and perspective of state biosecurity agencies. As a result ZAHRG now includes three additional members.

A priority in the coming year will be to review the AUSVETPLAN Zoo Enterprise Manual. ZAHRG will work with Animal Health Australia and the updated manual will form part of the AUSVETPLAN suite of emergency management manuals.

A great deal of behind the scenes work by AWHN goes into managing and servicing these national focus groups and other groups. For example, in the first three months of this year AWHN organised 31 teleconferences and attended three face to face meetings on a variety of wildlife health issues! I thank the AWHN team most sincerely for all the work that they do to ensure that the ZAHRG and other groups function smoothly and can provide specialist advice on wildlife issues.

The ZAHRG has been a great success story, for governments, the zoo industry and the many other people involved. Though it is hard work, it highlights the efforts of the AWHN to facilitate the collaborative links in the investigation and management wildlife health. This collaboration is vital to support Australia's agriculture, trade, human health and biodiversity. Many of the challenges Australia faces in wildlife health can be solved by good communication, coordination and sustained direction and focus. In future newsletters we will feature some of the activities of other AWHN groups and I encourage network subscribers to help and support the activities of these groups and each other where they can.



Photo Courtesy of Jane Hall

A Nationally Integrated Wildlife Health System for Australia

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## NEWS

### National Significant Disease Investigation (NSDI) Program — wildlife disease event funding

The National Significant Diseases Investigation Program (NSDI) subsidises livestock and wildlife disease investigations by veterinary practitioners where financial limitations to their investigation exist (e.g. low economic value of individual animals relative to the cost of veterinary services). Subsidies for investigations at remote locations are available for both the initial field and clinical evaluation, and for a follow-up investigation. In return, the practitioner must provide a case report of the investigation.

If you are interested in applying for funding, or would like more information on the NSDI please go to:

<http://www.animalhealthaustralia.com.au/programs/adsp/sdi.cfm>.

A list of NSDI contacts is available at this site. Incorporation of wildlife into the program is available in Victoria, Tasmania, Queensland, Northern Territory, New South Wales and South Australia. This program is funded by Animal Health Australia from livestock industry and government subscriptions. It aims to boost Australia's capacity for the early detection of emerging and emergency animal diseases by recruiting greater participation of veterinary practitioners and subsidising the cost of their disease investigations.

We would be very grateful if you could advise us when you apply for funding via the NSDI, and if you are successful, so that we can maintain a log of requests and which were successful. This will help us work to ensure the program is effective into the future. We are also happy to discuss your application prior to submission if you consider that would be helpful.

### Combating Crimes Against Wildlife in Australasia

Richard Jakob-Hoff, Senior Veterinarian,  
Conservation and Research,  
New Zealand Centre for Conservation Medicine  
(NZCCM), Auckland Zoo.

### Illegal Trade and Animal Welfare Concerns

Global trade in wildlife – including both animals and plants - rivals that of the illegal arms and drug trades. As such, it constitutes a major threat to the survival of many species whose futures are already in jeopardy due to other threats

such as loss of habitat, the spread of invasive species, disease, over-harvesting and climate change. Wildlife crimes also frequently involve extraordinary acts of cruelty such as amputation of shark fins and the collection of bile from bears without anaesthetic and the transport of live birds and reptiles in containers so cramped that the animals are unable to breath or regulate their body temperature and consequently a high proportion die in transit. Increasingly forensic scientists are also applying their skills to the detection of predators of endangered fauna such as individual dogs that kill kiwi when not under their owners' control or the identity of the species of predator raiding bird nests so that pest control can be targeted appropriately.

### Multi-disciplinary Approach

New Zealand and Australia are signatories to the Convention on International Trade in Endangered Species (CITES) and, as such, government regulatory bodies responsible for customs, biosecurity and conservation are actively involved in the prevention, surveillance, detection and apprehension of smugglers of protected plants and animal goods. Assisting them are a wide and expanding range of specialists with expertise in wildlife biology, animal welfare, entomology, botany, veterinary science, cybernetics, laboratory diagnostics, pathology, DNA analysis and animal law.



*Professor John Cooper demonstrates forensic necropsy technique on a possum*

### First Australasian Workshop and Symposium on Wildlife Forensics

The first Australasian gathering of nearly forty of these scientists and practitioners was held at the New Zealand Centre for Conservation Medicine (NZCCM), Auckland Zoo from 1-4 February, 2011. The event was jointly organised by the NZCCM, EcoGene/Landcare Research, Environmental Science and Research (ESR) and the Wildlife



*Attendees of the First Australasian Workshop and Symposium on Wildlife Forensics outside the New Zealand Centre for Conservation Medicine (NZCCM) at Auckland Zoo. Margaret and John Cooper are on the outside left and right of the back row.*

Enforcement Group (NZ Customs). Other organisations participating included the Ministry of Agriculture and Forestry (MAF), Department of Conservation (DOC), the WA Department of Environment and Conservation (DEC), the National Institute of Water and Atmospheric Research (NIWA), Unitec, North Tec, Universities of Auckland, Queensland, Murdoch, Massey and Washington, the Australian Museum and the Royal New Zealand Society for the Prevention of Cruelty to Animals (RNZSPCA).

Professor John Cooper, a veterinary pathologist with specialist expertise in wildlife, tropical diseases and comparative medicine, and his wife, Mrs Margaret Cooper, a lawyer with specialist expertise in animal law, travelled from the UK to lead an initial 2-day hands-on workshop. Eighteen participants discussed and practised a range of topics including examination of a wildlife crime scene, forensic examination and sample collection from both live and dead animals, forensic post-mortem technique, laboratory examination of forensic samples and preparation for court. The Coopers recently authored the text, *“Introduction to Veterinary and Comparative Forensic Medicine”* (2007, Blackwell Publishing) and drew on their wide experience working in Europe, Africa and the Caribbean to provide a valuable global context in which to discuss specific Australasian issues. Their energetic, inclusive style of teaching, peppered with plenty of humour, created a collaborative environment that encouraged full engagement of all participants.

Thirty-five people took part in the two-day symposium that followed the workshop. The first day was opened by three keynote presentations from eminent forensics practitioners: Professor Cooper, Professor Bruce Weir of the Department of Biostatistics at the University of Washington and Professor Adrian Linacre, South Australian Chair of Forensic Science at Flinders University, SA. They were followed by presentations from local scientists and enforcement agents covering a wide range of issues,

challenges and forensics techniques which, collectively, provided an excellent overview of the ‘state of the art’ in wildlife forensics in this part of the world. The full programme can be found at: <http://www.ecogene.co.nz/Program.asp>

**Developing an Australasian Wildlife Forensics Network**

A discussion to consider a follow up to this initial gathering was held on the last day. There was unanimous agreement that a formal Australasian network, possibly as a regional node of the recently established Society for Wildlife Forensic Science (<http://www.wildlifeforensicscience.org/>), should be established. Participants recognised the value of networking with each other and that continued collaboration would provide opportunities to raise the public profile of this important discipline and to make their individual efforts more effective through information sharing, professional development, joint research and standardization of techniques and processes.



*Radio New Zealand Science Reporter questions Wildlife Enforcement Group officer, Stuart Williamson, about confiscated items from CITES-protected species displayed during the conference.*

*Cont.*

## Role of Auckland Zoo's New Zealand Centre for Conservation Medicine (NZCCM)



Sita Yuen of ESR and University of Auckland examines a dead skink using some old, but still useful technology

Conservation Medicine is an emerging new discipline focussed on the development of collaborative, trans-disciplinary approach to wildlife conservation through the integration of expertise in the animal, human and environmental health sciences. One of the roles of our NZCCM is to facilitate the bringing together of individuals and organisations that share a common interest and concern for issues associated with wildlife health, including the zoonotic health hazards associated with human-wildlife interactions.

For further information see [www.conservationmedicine.co.nz](http://www.conservationmedicine.co.nz) or contact the author at: [Richard.jakob-hoff@aucklandcouncil.govt.nz](mailto:Richard.jakob-hoff@aucklandcouncil.govt.nz)

## Mass abandonments or unusual mass deaths of flying foxes – Request for reports

There have been a number of events this year in Queensland involving mass abandonment of flying fox young. Over 600 Spectacled Flying-fox young (*Pteropus conspicillatus*) were recorded 'abandoned' from the Cairns city colony over a period of three months, involving young of various ages, but over a half of them were preterm or under a month old. About 100 Grey-headed Flying-foxes (*P. poliocephalus*) from both Canungra and Gympie colonies were 'abandoned' over just a couple of nights and these were virtually all under a month old, an age they would normally be on their mothers 24 hours a day. Canungra had a similar event in 2008 with nearly 300 'abandoned' young. Several hundred Little red flying-fox (*P. scapulatus*) were also reported dead and dying from Eliot Falls in Cape York, involving both adults and young.

Mass abandonments or unusual mass deaths of flying-foxes should be reported to your AWHN wildlife coordinators (and to state conservation agencies) to discuss potential of further investigation. AWHN wildlife coordinator contact details: <http://www.wildlifehealth.org.au/AWHN/ProgramsProjects/Programs.aspx?id=9>

The Queensland Centre for Emerging Infectious Diseases (QCEID) [http://www.dpi.qld.gov.au/4791\\_18617.htm](http://www.dpi.qld.gov.au/4791_18617.htm) is

proposing to collate, review and analyse the apparent increasing number of unexplained mass abandonment/morbidity/mortality events in flying-foxes. QCEID would welcome incident data (via [debra.melville@qld.gov.au](mailto:debra.melville@qld.gov.au)) and is currently developing an incident report form which will be available on its website in the near future: [http://www.dpi.qld.gov.au/4791\\_18617.htm](http://www.dpi.qld.gov.au/4791_18617.htm)

If you see any signs of disease that are unusual, or clusters of wildlife deaths then you should contact your local AWHN Wildlife Coordinator or call the Emergency Animal Disease Watch Hotline: 1800 675 888 <http://www.daff.gov.au/animal-plant-health/pests-diseases-weeds/animal/spotted>

## Disease Events

### TAS

In November a large number of shearwaters washed up on the beaches. They were emaciated with signs of exhaustion, similar to observations in other locations. This appears to be part of a natural process.



There is ongoing monitoring of *Salmonella typhimurium* phage type 160 in sparrows but there have been no further detections in the last quarter. One salmonella case in a blackbird is pending *Salmonella* typing.

There have been a couple of toxoplasmosis cases this quarter, one a juvenile wombat in care and one pademelon on Maria Island.

Abalone ganglioneuritis virus was found within a farm on the East Coast. Sampling is being done on wild abalone with no positives so far. Media update on AVG testing from DPIPWE 18/1/2011:

<http://www.media.tas.gov.au/release.php?id=31421>

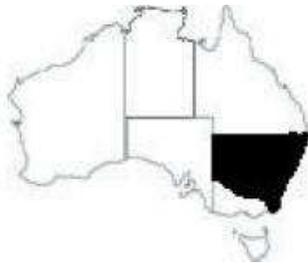
### ACT

There have been reports of Tammar wallaby mortalities in three collections in the ACT, and the Registry is currently working on the diagnostic investigation and has been sent samples. To date there have been over 100 deaths reported. NSW has also reported similar mortalities (see NSW report).

There have been reports of Grey-headed Flying-foxes again this year. The adults from the colony have returned, and the numbers are building. Public awareness about bats has been well propagated this year and minimal interaction with humans has been reported to date.

**NSW**

NSW has also had Tamar wallaby mortalities in Newcastle and Western Sydney. Approximately 38-60% of the Tammars in some of the collections have died.



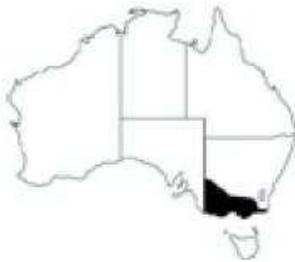
The Registry has received verbal reports of Tamar wallaby deaths dating back to mid November. In most cases deaths are rapid, but there is little in the way of gross lesions or histopathologic changes. The causative agent of the mortalities is thought to be an Orbivirus, however viral cultures are pending. Samples have been collected and sent to the Registry from each affected population – both fresh and fixed tissue. Viral culture is being conducted by EMAI, results are pending. There were suspected reports of this syndrome in 2007.

There are currently large wild rabbit populations in NSW, and there have been a number of reports of myxomatosis. This is indicative of lots of insects, which can transmit the virus to rabbits.

It is suspected that botulism events may occur again through the hot summer.

**VIC**

There have been three bats tested for lyssavirus, all of which tested negative at AAHL. These exclusions were as a result of C3 submissions (human contact) and involved two Grey-headed Flying-foxes and one Chocolate Wattled bat.



There have been investigations into deaths in hand reared joeys presenting with respiratory and neurological symptoms. A private laboratory found necrotising pneumonia and hepatitis with intranuclear inclusion bodies consistent with herpesvirus. No fresh tissues were submitted so virus isolation / PCR was not performed. A second joey was also submitted for testing; however it did not have similar lesions. It was diagnosed with bacterial pneumonia and septicaemia. There was no evidence of herpesvirus inclusions.

There have been two investigations involving mortalities in wild ducks; one of which was on a lake in suburban Melbourne where botulism was suspected as the cause of death. Avian Influenza was excluded in the one duck submitted for autopsy. No gross or histopathological lesions were present, consistent with a diagnosis of botulism.

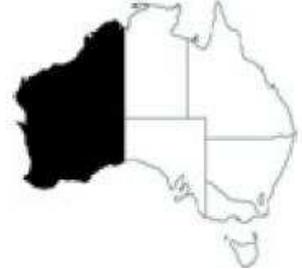
The second report was of a mass mortality of ducks in North Victoria in the flood zone. Two dead ducks were received for testing. Avian Influenza virus was ruled out by PCR. At the submitters request, samples from the ducks were submitted for detection of agricultural pesticides. No

organophosphates or organochlorins were detected. Botulism is suspected as the cause of death based on history, clinical signs and the lack of gross or histopathologic signs of other diseases. The current conditions are perfect for botulism, and clinical reports of weak hind limbs and inability to dive are consistent with this disease.

Wildlife Health Surveillance Victoria (University of Melbourne) is investigating deaths in eastern banjo frogs in Ballarat. Samples were sent to AAHL and a number were positive for chytrid fungus by PCR.

**WA**

There have been botulism events in Western Australia; however this is expected at this time of year. These are usually diagnosed clinically. Cloacal swabs are sometimes done for virus exclusion.



There has been a series of undiagnosed sudden deaths in birds in the last 12 months in various species - two mortalities in silver gulls, one in corellas, both late last year, and one in ravens this year. Gross pathology and histology are normally performed on all wildlife material submitted and AI and ND are ruled out in most cases. Testing by external laboratories, such as toxicology, is only undertaken when funds are available and when it is warranted by the circumstances.

In the last three years, there have been between six and seven deaths in western ringtail possums showing neurological signs. Two have been submitted for necropsy. Pathology material from one case was decent enough to show a Lymphocytic meningoencephalitis. The lesions suggest viral or protozoal aetiology however no stains have detected anything yet. Toxoplasmosis immunohistochemistry was negative. These cases are still being investigated.

**SA**

Shearwaters were reported to be found weak or dead along the southern SA coastline from Victor Harbor to Port Adelaide. Natural die-off of migrating birds due to exhaustion and starvation was suspected, with storm conditions and high seas possibly contributing. Pathology findings from available samples support this diagnosis.



A poisoning event occurred involving 50 galahs that were found dead in a wheat crop in November. Organophosphate toxins were found in tissue

samples. Locust spraying had been conducted nearby, but the toxins found were not the same as those used in the spray.

Small colonies of Flying-foxes are once again being seen in SA. The public are being made aware not handle bats due to the potential for lyssavirus infection.

Around five blind kangaroos were observed by rangers in Adelaide Hills and the Barossa area. Two were euthanased and examination showed a uveitis and chronic retinal degeneration, consistent with an Orbivirus infection. Results of virus testing are pending.

## NT

There have been a few bat lyssavirus rule-outs due to human contact, which have returned negative results.

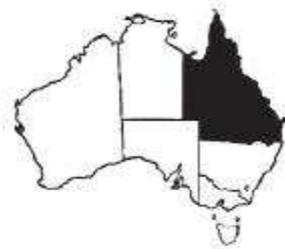
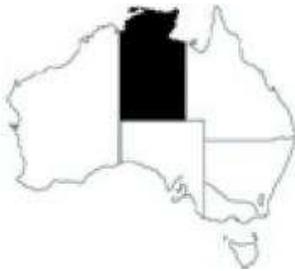
A few stranded turtles have been submitted, including a Hawksbill and Flatback. The Hawksbill had regionally extensive severe necrotising myocarditis with abundant intralesional bacteria. Unfortunately, attempts at bacterial isolation and identification were unsuccessful. This turtle also had a deep propeller strike to the carapace that had superficially healed; however, if underlying osteomyelitis remained, it could have been a source for bacterial emboli to the seed the myocardium.

## AAD

There have been two mortality reports from Macquarie Island. In one event, a ranger discovered about 200 rock hopper penguins dead at Aurora Point on the Northern end of the island. It appeared that they had died some time earlier, so samples were not collected for investigation. The larger colony didn't seem to have any problems. The second similar event was seen in October, with estimates of 200 royal penguins found dead on the southern end of the island, near the edge of a large breeding colony. This may be a natural occurrence. Further information regarding these events is being collected.

## QLD

A dozen bats were submitted for lyssavirus exclusion testing. Three bats were confirmed positive for ABLV by both fluorescent antibody test for lyssaviral antigen and PCR for pteropid ABLV viral RNA. The three bats included one female Spectacled Flying-fox (*Pteropus conspicillatus*) from the Atherton tablelands, one female Black Flying-fox (*Pteropus alecto*) from Brisbane and one immature male Black Flying-fox from the Gold Coast. All three bats presented with neurological signs, and in two of the cases there was a history of the bat having bitten a wildlife carer. The Black Flying-fox from the Gold Coast also tested negative for Hendra virus.



Another Black Flying-fox that presented with neurological signs had a severe meningoencephalomyelitis associated with nematodes. The histological features were consistent with *Angiostrongylus* sp. A Grey-headed Flying-fox also presented with neurological signs, and was subsequently diagnosed with traumatic osteomyelitis and synovitis.

Five Flying-foxes were submitted due to dog contact, all lyssavirus negative.

In early December a carer reported mass abandonment of Grey-headed Flying-fox pups at colonies in Canungra and Gympie. It is unknown what may have caused the abandonment. At Canungra there were 90 sick and 200 dead pups, with a further 50 sick and 100 dead from Gympie. Six were submitted for necropsy, with no significant findings on gross examination or histology, suggesting exposure or starvation as the cause of death. Exclusion testing for Hendra and lyssavirus was negative. Two colonies have had similar events previously.

25 white ibis were found dead in October on the Gold Coast, with no significant findings on necropsy. Newcastle disease (ND) and avian influenza (AI) were all excluded.

Hundreds of dead short tailed shearwaters were washed ashore on beaches in October. AI was excluded and starvation/exhaustion was considered to be the cause of death.

There have been three cases of poisoning reported in birds in separate locations in south east Queensland in October and November, all confirmed via detection of fenthion ethyl, an organophosphate insecticide in the gastro-intestinal tract. In two separate incidents, crows (*Corvus* sp.) were found dead, with no significant findings on gross necropsy or histopathologic examination. In the third event, five Australian magpies (*Gymnorhina tibicen*) were found dead, followed 10 days later by the death of another 15 birds of the same species at a nearby location. Prior to death, one bird was seen to be paralysed and frothing at the beak; this bird was submitted for necropsy. Histologically, mild acute multifocal necrotic hepatitis was detected. AI and Newcastle disease virus were excluded via PCR in all three cases.

In Far North Queensland on Raine Island, Parks and Wildlife staff recorded mortalities in crested terns, with 11 dead and three sick. Other bird species were unaffected. Birds were found moribund, ataxic and unable to fly. Nothing significant was found on gross examination or histology. AI and ND were both excluded. A pesticide screen was negative.

## INTERESTING CASE

### The Australian Registry of Wildlife Health

### Sea Turtles—Lord Howe Island

Finding fresh, deceased sea turtles is rare on Lord Howe Island. The discovery of two green turtles in recent months proved to be a unique opportunity to assess health, cause of death and possible pathogens via necropsy. The turtles, found dead and washed ashore on different sections of the island, were frozen upon retrieval and shipped to the Australian Registry of Wildlife Health for post mortem examination. On necropsy, both animals were found to be severely emaciated, and had lesions consistent with septicaemia including reddening of the skin and plastron surfaces, small multifocal haemorrhages throughout the musculature and several organs. In both animals, the kidneys were found to be large and firm and contained large, tan, caseous, lamellated granulomas occupying a large portion of the parenchymal tissue. In one case, infection also appeared to have affected the renal bladder (7579.1), in the other turtle the gonadal tissue also appeared affected (7949.2). These lesions were very dramatic and it was interesting that 2 animals from this region were so severely debilitated with a bacterial nephritis. An unusual bacterium, *Shewanella putrefaciens*, was identified upon bacterial culture in one of the animals (7579.1).



Green Turtle, kidney



Green Turtle, bladder

### DISEASE WATCH HOTLINE 1800 675 888

**The Disease Watch Hotline is a toll-free number that connects callers to the relevant state or territory officer to report concerns about any potential emergency disease situation.**

Wildlife Health in Australia is the newsletter of the Australian Wildlife Health Network. The newsletter aims to facilitate communication between people with an interest in Australian wildlife health issues. It is distributed to approximately 500 professionals and others around the country and overseas. We encourage you to show it to others and give us critical feedback on its contents.

*If you wish to contribute to a future addition of the newsletter please send (in word format) articles to the AWHN email or postal address with your name and contact details supplied.*

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website: [www.wildlifehealth.org.au](http://www.wildlifehealth.org.au)



## WILDLIFE COORDINATORS\*

### GOT SOMETHING TO REPORT?

We are interested in receiving reports of unusual or mass wildlife mortalities. If you see anything suspicious, please download and complete the submission form (endorsed by Animal Health Australia) found on our website ([www.wildlifehealth.org.au](http://www.wildlifehealth.org.au)) and send it to your local Dept of Primary Industries or your State Coordinator as listed below.

State or Territory	Coordinators	Notes	Address	Contact details
AAD (Australian Antarctic Division)	LESLIE FROST	Government Rep Appointed by the Director, Australian Antarctic Division (DEWR)	Australian Antarctic Division Channel Highway Kingston TAS 7050	<a href="mailto:leslie.frost@aad.gov.au">leslie.frost@aad.gov.au</a> W: 03 6232 3414 F: 03 6232 3828 M: 0438 624 871
ACT	WILL ANDREW	Government Vet	ACT Veterinary Services Parks Conservation & Lands (Athlon) P.O. Box 158 Canberra ACT 2601	<a href="mailto:will.andrew@act.gov.au">will.andrew@act.gov.au</a> W: 02 6207 2357 F: 02 6207 2093 M: 0419 239 073
NSW	GREG CURRAN	Government rep Appointed by CVO NSW	NSW Industry and Investment PO Box 789 Broken Hill, NSW 2880	<a href="mailto:greg.curran@industry.nsw.gov.au">greg.curran@industry.nsw.gov.au</a> W: 08 8088 9336 F: 08 8087 3488
NT	CATHY SHILTON	Government rep Appointed by CVO NT	Dept of Business, Industry and Resource Development Berrimah Vet Laboratories GPO Box 3000, Darwin, NT 0801	<a href="mailto:cathy.shilton@nt.gov.au">cathy.shilton@nt.gov.au</a> W: 08 8999 2122
QLD	ANITA GORDON	Government rep Appointed by CVO QLD	QLD Dept Primary Industries Animal Research Institute 665 Fairfield Road Yeerongpilly, QLD 4105	<a href="mailto:anita.gordon@dpi.qld.gov.au">anita.gordon@dpi.qld.gov.au</a> W: 07 3362 9419 F: 07 3362 9440
TAS	SARAH PECK	Government Rep Appointed by CVO TAS	Department of Primary Industries, Parks, Water & Environment GPO Box 44 Hobart TAS 7001	<a href="mailto:sarah.peck@dpiw.tas.gov.au">sarah.peck@dpiw.tas.gov.au</a> W: 03 6233 6624
SA	CELIA DICKASON	Government rep Appointed by CVO SA	Disease Surveillance, PIRSA Animal Health Flaxley Agricultural Centre P.O. Box 1571 Flaxley SA 5153	<a href="mailto:celia.dickason@sa.gov.au">celia.dickason@sa.gov.au</a> W: (08) 8391 7125 F: 08 8388 8455
VIC	MARK HAWES	Government rep/ Appointed by CVO VIC	Department of Primary Industries Primary Industries Research Victoria 475 Mickleham Rd, Attwood VIC 3049	<a href="mailto:mark.hawes@dpi.vic.gov.au">mark.hawes@dpi.vic.gov.au</a> W: 03 9217 4209 F: 03 9217 4399
WA	TOM HOLLINGSWORTH	Government rep Appointed by CVO WA	Animal Health Laboratory Department of Agriculture, WA Locked Bag 4 Bentley Delivery Service WA 6983	<a href="mailto:thollingsworth@agric.wa.gov.au">thollingsworth@agric.wa.gov.au</a> W: 08 9780 6280 F: 08 9780 6136
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<b>Other Useful Contacts</b>				
Australian Registry of Wildlife Health	KARRIE ROSE	Manager	Taronga Zoo Veterinary & Quarantine Centre PO Box 20 Mosman NSW 2088	<a href="mailto:krose@zoo.nsw.gov.au">krose@zoo.nsw.gov.au</a> W: 02 9978 4749 F: 02 9978 4516
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