

**Wildlife Trade Operation for wild harvest and export of venom, blood
and body parts from
Australian native snake species submitted for approval under the
Environment Protection and Biodiversity Conservation Act 1999 (EPBC
Act)**

1. Title and introduction

Snake derived venom, blood and body parts have been used internationally for medical research into therapeutic compounds, production of human therapeutics and diagnostics, pure research and development of biological reagents. The current application proposes to continue this work.

Species covered:

i) Blood and body parts of all native Elapidae (Australian front-fanged snakes), which have been legally harvested under permit issued by the relevant State or Territory government.

ii) Venom, venom derivative or venom product or a naturally sloughed skin of all native Elapidae (Australian front-fanged snakes), which have been legally harvested under permit issued by the relevant State or Territory government except the following species for which an existing exemption is in place for venom, venom derivative or venom product or a naturally sloughed skin:

Common Death Adder	<i>Acanthophis antarcticus</i>
Northern Death Adder	<i>Acanthophis praelongus</i>
Desert Death Adder	<i>Acanthophis pyrrhus</i>
Lowlands Copperhead	<i>Austrelaps superbus</i> South Australia and Victoria)
Pygmy Copperhead	<i>Austrelaps labialis</i> (Kangaroo Is. only)
Stephens Banded Snake	<i>Hoplocephalus stephensii</i>
Peninsular Tiger Snake	<i>Notechis ater niger</i> (Kangaroo Island)
Western Tiger Snake	<i>Notechis ater occidentalis</i>
Eastern Tiger snake	<i>Notechis scutatus</i>
Inland Taipan	<i>Oxyuranus microlepidotus</i>
Coastal Taipan	<i>Oxyuranus scutellatus scutellatus</i>
King Brown Snake	<i>Pseudechis australis</i>
Collett's Snake	<i>Pseudechis colletti</i>
Spotted Black Snake	<i>Pseudechis guttatus</i>
Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>
Dugite	<i>Pseudonaja affinis</i>
Peninsula Brown Snake	<i>Pseudonaja inframacula</i>
Western Brown Snake	<i>Pseudonaja nuchalis</i>
Common Brown Snake	<i>Pseudonaja textilis</i>
Rough-scaled Snake	<i>Tropidechis carinatus</i>

Location of harvest

These species are harvested in small numbers from private lands in South Australia, Queensland and Victoria (other States may be included in the future) within their normal ranges in accordance with restrictions listed in the approvals from the respective State authorities. The ranges of each species can be obtained from the books Cogger, H.G. (2000), *Reptiles and Amphibians of Australia* Reed New Holland, Sydney and Wilson, S. and Swan, G. (2003) *A complete guide to Reptiles of Australia*. Reed New Holland, Sydney.

Description of what is being harvested

Live snakes are collected opportunistically in small numbers. Whilst Venom Supplies has permits in South Australia to collect numbers of snakes used for venom extraction, we rarely collect ten individuals per year for any species. Exceptions to this are *Pseudonaja textilis* and *Notechis scutatus*, of which up to 20 individuals may be collected per year. This permit provides for potential venom requirements and a few individuals are euthanased and used for blood extraction and harvest of body parts. Sloughed skins from various species are also required from time to time.

Species status under state legislation

All species listed are protected under the relevant state legislation. The status of the population of each species is taken into account by the respective State or Territory government before approval to collect specimens is granted.

Most snakes are sourced from South Australia. The other parts of Australia where snakes have been sourced are Victoria (*Notechis scutatus*) and Queensland (*Oxyuranus scutellatus*, *Tropidechis carinatus*, *Pseudonaja textilis* and *Acanthophis antarcticus*). It is possible that we may require snakes from other States from time to time. It is impossible to predict this in advance. As mentioned previously, these snakes would be used primarily for venom extraction with blood and body parts being extracted only rarely.

2. General Goal/Aims

The aims and goals of making blood serums and body parts available are for medical research purposes. Snake blood contains natural inhibitors to snake venom components and are being researched in various parts of the world. Venom glands and livers are used to clone venom components and make gene libraries.

Development of a product using gene libraries with the University of São Paulo in Brazil is ongoing.

Here is a selected list of published work relating to these aims:

Thurn, M.J., Broady, K.W. and **Mirtschin, P.J.** (1993). Neutralisation of tiger snake (*Notechis scutatus*) venom by serum from other Australian elapids. *Toxicon* 31(7): 909-912.

Flachsenberger, W., Leigh, C.M., **Mirtschin, P.J.** (1995). Sphero-echinocytosis of the human red blood cells caused by snake, red-back spider, bee and blue-ringed octopus venoms and its inhibition by snake sera. *Toxicon* 33(6): 791-797.

Butler, T.L., Jacobsen, P.F., **Mirtschin, P.J.**, Kakulas, B.A. (1998). An *In Vitro* study of the effects of venom of Australian elapids on murine skeletal muscle and the protective effect of homologous plasma. *J. Venom. Anim. Toxins*. 4(1): 36-50.

Smith, A., Marshall, L.R., **Mirtschin, P.J.**, Jelinek, G.A. (2000). Neutralisation of the clotting activity of Australian snake venoms by snake plasma. *Toxicon* 38 1855-1858.

3. Harvest Details

The snakes will be/have been opportunistically collected under state legislation controls which regulate the collecting of native species. Whilst the details of collecting requirements in each State vary slightly, they all generally require a permit to collect and an additional permit to export the snakes from the source State and a permit to import the snakes into South Australia. Details of these permits are usually available on the respective State website. All the requirements and methods used have to be approved by the respective State authority. In each case it is simply a matter of catching the snakes when opportunities arise. Collection is by hand and in most cases the snakes are collected when they are interacting with the public and are removed to reduce the risk of snake bite to the public.

Areas collected: Snake are collected within their normal range in accordance with state controls. In all cases these areas are outside national and conservation parks. The respective ranges can be found in Cogger, H.G. (2000), *Reptiles and Amphibians of Australia* Reed New Holland, Sydney and Wilson, S. and Swan, G. (2003) *A complete guide to Reptiles of Australia*. Reed New Holland, Sydney.

Land Ownership: Private land ownership across South Australia, Victoria and Queensland (and other States if required).

Quantities harvested: In each case the number of snakes harvested is low and in accordance with state permit numbers. Non-selective methods are used. Snakes are collected on an opportunistic basis and in most cases when interacting with the public to remove snake hazard. Our South Australian permit allows 10 individuals per species except for *P. textilis* and *N. scutatus*. In most cases these limits are not reached and in fact in many instances none are collected. Again, they are collected for venom extraction where some are used for blood extraction and body parts.

Harvest Methods: Snakes are caught by hand using a snake jigger, a soft padded device attached to a handle used to safely pin the snake without harming it (see picture).



Jigger is used to gently restrain snakes

Harvest Time: Snakes are generally harvested during their active period which is mostly from September to April each year.

General husbandry:

All snake husbandry and procedures at Venom Supplies Pty Ltd are subject to current animal ethics approval from the Animal Ethics Committee of the Institute of Medical and Veterinary Sciences (IMVS, Gilles Plains, South Australia).under an agreement with the Minister for Environment and Aboriginal Affairs, South Australia. Snakes are maintained under approved laboratory conditions under the supervision of the AEC IMVS.

4. Impact of Harvest on Ecosystems

The impact of collecting on the ecosystem is immeasurably low and the likely impact of the collecting on species abundance is negligible. In general terms the relative impact of collecting animals for any purpose compared with other environmental impacts such as habitat loss and feral animals can be realised by reading an assessment by Professor Hal Cogger regarding land clearing in Queensland (Cogger *et al*, 2003). The report stated that an estimated 89 million reptiles are being killed annually in Queensland by land clearing. Earlier, hugely conservative, estimates in Ehmann and Cogger (1985), *Australia's endangered herpetofauna: a review of criteria and policies*, reflect the true perspective of collecting compared with other classes of mortality:

<u>Natural mortality</u>	3,840 million	99.77%
<u>Human induced mortality</u>		
Road kills	5.48 million	0.14%
Land clearing	3.26 million	0.08%
Research collecting	0.02 million	0.0005%
Skins and amateur collecting	<0.02 million	0.0005%

5. Monitoring & Assessment

The environmental impact of the proposed activity of collecting snakes is believed to be miniscule. Monitoring is applied at both State and Federal levels by state wildlife agencies through returns submitted by us and DEW are informed through Specimen Export Records. No population studies have been carried out on these species in the areas from which they are likely to come nor is any analysis possible.

5.1 Resource assessment.

No population studies have been conducted for these species in areas from which they are likely to be taken. See above. Ecological studies of reptiles tend to be conducted in reserves. These specimens will all come/have come from private property.

6. Effective Management Strategies

Population changes are hardly detectable when working with such small numbers over brief periods and would be indistinguishable from the effects of season and meteorological conditions on observable abundance.

The effectiveness of our management in the laboratory of the snakes we collect and hold is reflected in returns submitted to state wildlife authorities and Animal Ethics Committee, IMVS. Our standards are maintained at a superior level. Monitoring and feedback may result following review by these bodies of submitted returns.

7. Compliance

State government agencies, particularly the South Australian Department for Environment and Heritage, monitor our compliance with permit terms in collecting snakes from the wild and therefore are best situated to provide information on how they ensure only legally obtained specimens are used in commercial trade.

Compliance with the requirements of animal care and ethics requirements are overseen by the Animal Ethics Committee of the Institute of Medical and Veterinary Sciences (IMVS, Gilles Plains, South Australia).

8. Reports

DEW is informed through Specimen Export Records. The applicant will further provide the information already being supplied to the South Australian and other State authorities if required by DEW. The applicant maintains contact and reports to AEC IMVS.

9. Background information

Biological and ecological information on most Australian snake species is poorly known.

Professor Rick Shine from the University of Sydney is the best known in this area and an overview of biology and ecology of the Australian species involved can be found in Shine (1991), *Australian Snakes: A Natural History*.

Allen Greer authored a work which summarises a vast body of knowledge of the biology of Australian snakes in Greer, A.E. 1997. *The Biology and evolution of Australian Snakes* Surrey Beatty and Sons, Chipping Norton.

For taxonomic summaries see Cogger, H.G. (2000), *Reptiles and Amphibians of Australia* Reed New Holland, Sydney and Wilson, S. and Swan, G. (2003) *A complete guide to Reptiles of Australia*. Reed New Holland, Sydney.

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Cogger, H.G., Ford, H., Johnson, C., Holman, J. and Butler, D. (2003). *Impact of Land Clearing on Australian Wildlife in Queensland*. WWF Australia Report.

Ehmann, H. and Cogger, H. (1985) Australia's endangered herpetofauna: a review of criteria and policies. *Biology of Australasian Frogs and Reptiles* (eds G. Grigg, R. Shine & H. Ehmann), pp. 435-447. Royal Zoological Society of New South Wales, Sydney, Australia.

Greer, A.E. 1997. *The Biology and evolution of Australian Snakes*, Surrey Beatty and Sons, Chipping Norton.

Shine, R. (1991). *Australian Snakes: A Natural History*, Reed Books, Sydney.

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