



A Regional Strategy for Animal Biodiversity Biobanking in Australia and New Zealand

Preamble

Biobanking is expanding from being a tool used in agriculture and clinical practice to one which has growing significance for many fields including the management and protection of the environment and endangered species. Biobanking is the storage of the living cells in a manner that allows them to be retrieved and used to develop viable, living organisms. Plant biobanks (or seed banks) used for conserving strains of crop species in agriculture, or for rare plants threatened with extinction, are one example. Biobanks for animals usually involve cryopreservation (controlled freezing) of sperm, eggs and embryos. Repositories such as these play an important role in human health (e.g. human IVF), medical research (biomedical biobanks) and agriculture (e.g. genetic management in the dairy and other livestock industries). Some countries recognise biobanking as a matter of national security; the USDA plant and animal genetic resources unit holds specimens of agriculturally important and rare genetic animal breeds and plant varieties. Biobanks for conserving the genetic and biological diversity of native animals (invertebrates and vertebrates) have received less attention and investment, but offer many potential benefits. In particular, biobanking for native animals offers the potential to manage the genetic diversity of wild and captive populations, contributing to the resilience of populations, species and ecosystems, and to mitigate the risk of species extinction. Taronga Conservation Society Australia's collaborative initiative to store the living genomes of Great Barrier Reef coral species is one example of a current initiative the network could greatly enhance by working within a trans-national framework and collaboration.

Expert Workshop, Melbourne, June 2-3, 2016.

An expert workshop to discuss a co-ordinated regional approach to the storage of tissue and living genomes of Australasian wildlife (organised by the FAUNA Research Alliance with support from the Ian Potter Foundation) was held over two days at Melbourne Museum and Melbourne Zoo, *June 2-3, 2016*. The meeting was attended by Australian, New Zealand and international participants from genome storage facilities, museums, zoos, universities, NGO's and conservation agencies. These individuals represented all the significant research, technology and storage facilities operating in the area, and with the potential to expand to form a coherent regional network.

The meeting recognised that the Biobanking of live, retrievable gametes, embryos or cells of native vertebrate and invertebrate animals offered:

1. Opportunity for Innovation in Conservation

- By providing new tools to prevent species extinctions, particularly in cases where threatening processes develop rapidly before monitoring detects declines and ameliorative action is implemented.
- As an important emerging tool for managing the genetic diversity and maintaining the resilience of populations and species within functioning ecosystems.

2. Potential Expertise and Backbone Facilities Exist

- Several facilities throughout Australia and New Zealand have an existing capacity to biobank the live genomes of native animals, and a number already do so.
- There is a core of active researchers in Australia and New Zealand, supported by international collaboration, who are engaged in developing and improving the enabling technologies for the biobanking of native animal genomes, and recovery from storage of live offspring.

3. The Current Situation Limits Realising this Opportunity

- Support for biobanking is *ad hoc* at a state and national level, and limits the realisation of the potential of this tool to contribute to the conservation and management of Australian and New Zealand genetic and biological diversity.

4. A national approach across government and private sectors within Australia and New Zealand is essential to the development of a sustainable network of appropriately resourced biobanking facilities.

- These facilities would store live, viable genomes of native animals to international benchmarks of governance, databasing and risk management. The facilities should be supported by a strong base of research and development of enabling technologies in universities and other institutions, and provide training and technology transfer to end-users involved in wildlife management and species recovery.

The meeting resolved:

- To establish a Network for tissue storage and the strategic and systematic biobanking of Australian and New Zealand native animal genomes involving facilities and institutions, researchers, end-users and other stakeholders.
- The Network will be operated, in the first instance, through a platform established by the FAUNA Research Alliance on behalf of the Network. The network will be named FAUNABank. Membership and participation will be open to institutions and individuals who are stakeholders, or potential stakeholders in the use of bio-banked animal genomes for conservation and management of biodiversity.
- The Network will be guided in the first instance by a steering committee agreed to at the Melbourne genome storage workshop.
- The Network's activities will include advocacy at the state and national level across Australia and New Zealand; promotion of a common database and governance systems for the management of stored tissue and live native animal genomes; information and technology sharing and transfer; initiation and promotion of collaborative projects aimed at delivering solutions in wildlife conservation and management that utilise stored genomes and enabling reproductive technologies; and the formation of taxon-specific working groups.

FAUNABank Steering Committee

Name	Institution
Dr John Clulow (Chair)	FAUNA Research Alliance / University of Newcastle
Dr Rebecca Hobbs (Facilitator)	Taronga Conservation Society Australia
Dr Marissa Parrott	Zoos Victoria
Dr Joanna Sumner	Museums Victoria
Dr Peter Mawson	Perth Zoo
Dr Frank Molinia	Landcare Research, New Zealand

FAUNABank Taxon Specialist Working Groups (Enabling Technologies)

Taxon Groups	Members
Invertebrates	J Daly, R Hobbs, M Hagedorn
Fish/Amphibians	J Daly, S Clulow, J Germano, N Calatayud
Reptiles/Birds	F Molinia, S Clulow, S Johnston, I Malecki, R Hobbs
Marsupials/Monotremes	S Johnston, P Temple-Smith, T Keeley, F Molinia
Eutherian Mammals	S Johnston, P Temple-Smith, R Hobbs, J Shaw

For further information contact:

Dr John Clulow Email:

Dr Rebecca Hobbs Email: