

PROPOSAL FOR APPROVAL OF A WILDLIFE TRADE OPERATION

1. INTRODUCTION

The applicant would like his operation to be considered for approval as a Wildlife Trade Operation (WTO) under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to enable the commercial export of specimens of Australian Lungfish (*Neoceratodus forsteri*).

The Australian Lungfish is listed as a vulnerable species under the EPBC Act and is also listed on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). An EPBC Act listed threatened species can only be commercially exported if the specimen is obtained from an approved captive breeding, aquaculture or artificial propagation program. For specimens listed on Appendix II to CITES an export permit for commercial purposes can only be issued if the specimen is obtained from an approved captive breeding program, WTO or wildlife trade management plan.

The applicants operation does not meet the requirements for a captive breeding program as they have not bred Australian Lungfish to second-generation. Approval as an aquaculture program (AQ) will satisfy the EPBC Act requirement for an EPBC Act listed threatened species, whilst approval as a WTO will satisfy the EPBC Act requirement for a species listed on Appendix II to CITES.

The Australian Lungfish stock owned by the applicant were purchased from [a third party] in 2009. [The third party] was approved as both a WTO and an AQ under the EPBC Act from 2002 to 2009. The applicant does not intend to harvest any more Australian Lungfish from the wild, nor would he be permitted to by Queensland authorities.

2. GENERAL GOAL

The primary goal of the operation is to breed Australian Lungfish for commercial purposes, using the brood stock acquired from the wild by the previous owner. The long-term goal of the applicant is to work toward breeding the Australian Lungfish to second generation. In addition, the applicant believes that a legal commercial export trade in Australian Lungfish will reduce the impact of trade on wild populations. Regular supply will reduce the incentive to illegally sell or buy wild caught animals by reducing the monetary value of the species on the international market. To date, many legally exported juveniles have been used for display in museums and public aquariums, and have been provided to institutes for scientific research purposes. This has also helped to reduce the impact of legal collection for such purposes on wild populations.

The applicant has been educated and involved with fish physiology since 1992. Although there are many publications on the Australian Lungfish, the majority of the studies have focused on the evolution and general biology and ecology. Very little information about the physiology of Australian Lungfish is known. The applicant is planning to undertake more scientific research to enhance the understanding of this species.

3. HARVEST DETAILS

No specimens of Australian Lungfish can or will be harvested from the wild for the purpose of this application.

The applicant currently holds 10 (five male and five female) adult brood stock. As detailed above, these were purchased from [a third party] in 2009. They were collected from the wild in 1998 under the supervision of officers of what is now known as Fisheries Queensland (FQ). Each brood stock

individual was fitted with an internal Passive Integrated Transponder (PIT) tag and DNA was extracted for FQ records.

These brood stock are kept and bred in a closed, controlled environment under a FQ approved Aquaculture licence, number [private], in accordance with the provisions of the *Fisheries Act 1994* (Qld).

Detailed information about these 10 brood stock individuals will be provided to the Department of the Environment in annual reports (see 8. *Reporting*).

4. IMPACT OF HARVEST ON THE TAXA AND THE RELEVANT ECOSYSTEM

As mentioned under Section 3. Harvest Details, no further Australian Lungfish can or will be harvested from the wild for the purpose of this application. Therefore, there will be no harvest impact on the taxa, nor will there be any impact on their ecosystem.

In recognition of its unique phylogenetic status and restricted distribution, the Australian Lungfish has been protected under Queensland legislation since 1914. Australian Lungfish are currently protected under the *Fisheries Act 1994* and are listed on Appendix II of CITES. The Australian Government listed the Australian Lungfish as a threatened species in 2003 in the category of 'vulnerable' under the provisions of the EPBC Act.

Because of the conservation status of the Australian Lungfish, the applicant recognises the fear that commercial utilisation may be detrimental to the survival of the species in the wild. However, the applicant will not be harvesting from the wild and is taking measures to ensure any Australian Lungfish that reach the international market are traceable back to their operation, and in the future, to their brood stock.

In recognition of the fact that the applicant will be profiting from trade in an Australian native animal which is very special to the applicant, is unique and has a much localised distribution, the applicant plans to contribute directly to the conservation of the animal and its natural habitat. Up to 1% of profits that the applicants make from the commercial export of the species will be dedicated to the conservation of the Australian Lungfish. The allocation of this money will be at the discretion of the applicant but will be included in the report prepared for the Department of the Environment (see 8. *Reporting*).

5. MONITORING AND ASSESSMENT

The stock owned by the applicant was purchased from [a third party] in 2009. [The third party] was approved as both a WTO and an AQ under the EPBC Act from 2002 to 2009. The applicant does not intend to (nor would be permitted to) harvest any more Australian Lungfish from the wild. Therefore, for the purpose of this application, there is no need for monitoring or assessment of the wild population by the applicant.

6. MANAGEMENT STRATEGIES

Breeding Activity

Operation period by [a third party] (2000-2008)

- In 1998, 10 Australian Lungfish (five male and five female) were taken from the wild under a permit issued by FQ.
- In 2000, three breeding pairs of Australian Lungfish produced between 20,000 and 25,000 eggs. However, a series of unforeseen events meant that the majority of these eggs did not

hatch. These events included a very late season, and poor preparation for such a huge number of offspring.

- In 2001, one breeding pair produced 8,812 eggs, resulting in the survival of more than 400 juvenile Australian Lungfish.
- In 2002, no spawn occurred.
- In 2003, two breeding pairs produced approx 5,000 eggs and approx 1,500 juveniles were raised.
- In 2004, no spawn occurred, possibly due to poor water conditions.
- In 2005 and 2006, no spawn occurred.
- In 2007, one breeding pair produced in excess of 15,000 eggs and about 6,500 juvenile fish were successfully raised. Of these about 4,500 fish were lost due to predation by white-tailed water rats. Management measures were put in place to ensure this would not happen again.

Operation period by the applicant (2009-present)

In February 2009, the applicant bought the business operation from [a third party] together with all the broodstock and juvenile Australian Lungfish.

All the Australian Lungfish were translocated to a new facility located in Brisbane where they have been held by the applicant (details of the list of Australian Lungfish will be provided in a report to the Department of the Environment (see 8. *Reporting*).

The applicant was approved as a WTO and AQ in 2011.

There was no attempt to breed Australian Lungfish in 2011, 2012 and 2013 seasons due to an adequate stock level of juvenile fish held by the applicant.

The operator continues to hold 10 brood stock (5 matured males and 5 matured females).

Offspring

Each breeding season, a small proportion of the first generation offspring (future breeders) were retained by the previous operator for the purposes of conservation breeding and to work toward the goal of producing second generation offspring of Australian Lungfish in a captive environment.

It is estimated that the Australian Lungfish reaches maturity between 15 and 20 years of age, although breeding maturity is probably determined by size rather than age and maturity is believed to be reached somewhere between 700 and 750mm.

The applicant currently has:

- 10 retained juveniles (unmatured) as future breeders (F1s) aged between 8-11 years, and
- 267 retained juveniles for export purposes aged 7 years or younger.

If in the future it is agreed that the captive stock kept at the applicant's premises are required for the purpose of conservation breeding (e.g.: to re-stock wild populations), the number of offspring retained may need to increase to meet such requirements.

7. COMPLIANCE

All live specimens of Australian Lungfish exported from the applicant's premises will be animals that are at least first generation, produced from the brood stock kept on the premises.

All live specimens of Australian Lungfish exported from the applicant's premises will be tagged with an internal (PIT) tag and a number (say 20-30) of juveniles from each breeding pair will be made available for DNA sampling to FQ (see 8 *Reporting*). It is hoped that in the future, these

samples will assist FQ in the development of micro-satellite markers for the Australian Lungfish. If such markers are discovered, any Australian Lungfish on the international market will not only be traceable back to the applicants' premises, but traceable back to the parents of the individual.

The applicant has concurrently applied to the Department of the Environment for approval of his operation as an AQ under the EPBC Act. If both program applications are approved, all specimens of Australian Lungfish at the applicant's premises will be kept and produced in accordance with the conditions of both the AQ and WTO.

The applicant will supply the Department of the Environment with a list of all PIT tag numbers held, including unused tags and those already fitted to stock. Combined with the reporting requirements (see 8. *Reporting*), this will enable the Department of the Environment to monitor any stock exported against the PIT tag inventory from the applicant. Permits would only be approved where the applicant provides the PIT tag numbers of the stock to be exported. By having this mechanism in place, authorities such as the Australian Quarantine Inspection Service and the Australian Customs and Border Protection Service can assume that any stock sent for export without a PIT tag to be illegally sourced.

8. REPORTING

A report for the previous calendar year will be supplied to the Department of the Environment by 31 March and will relate to all specimens, not just those exported. The report will include the following information:

Stock

Brood Stock:	Offspring retained as future broodstock	Offspring held for commercial use	Offspring sold (domestic and international)
PIT tag number	Parents	Quantity	Destination
Sex / partner	PIT tag number	Age classes	Quantity
Size (mm) previous year	Sex / partner		PIT tag numbers
Size (mm) current year	Size (mm) previous year		
Number of eggs	Size (mm) current year		
General health	General health		

If and when spawning occurs, the applicant will supply the Department of the Environment with a copy of a letter from an FQ officer, confirming a visit to the applicant's premises on at least one day during the spawning event.

Exports & Compliance

When applying for export permits, the applicant will list the PIT tag numbers of the stock to be exported. The PIT tag numbers of all Australian Lungfish exported by the applicant during the previous calendar year will also be supplied. These numbers will be verified against the list of PIT tag numbers provided to the Department of the Environment by the applicant.

Conservation & Research

If the applicant plans to fund any type of conservation or research initiative in the following year (or has funded such during the previous year), he may submit a brief proposal (or summary) of such to the Department of the Environment (though this is not compulsory).

9. BACKGROUND INFORMATION

Taxonomy

Kingdom:	Animalia
Phylum:	Chordata
Class:	Osteichthyes (Bony Fishes)
Order:	Ceratodontiformes
Family:	Ceratodontidae
Genus:	<i>Neoceratodus</i>
Species:	<i>forsteri</i>

Natural History

Along with the South American Lungfish *Lepidosiren paradoxa*, and four African Lungfish species in the genus *Protopterus*, the Australian Lungfish *Neoceratodus forsteri* is one of only six surviving members of a highly successful group of fishes that first appeared in the Devonian period, some 350 million years ago. A recent revision of Australian Lungfish of the family Neoceratodontidae describes 11 species of lungfish, including *N. forsteri* that once inhabited central, northern and eastern Australia.

Today, the natural habitat of the Australian Lungfish is the Mary and Burnett Rivers in South-East Queensland, Australia. It is also found (possibly through translocation) in several other river systems in South-East Queensland including the Brisbane River. Fossil evidence demonstrates that the distribution of the Australian Lungfish has contracted over time.

Recent scientific studies have shown the Australian Lungfish to be abundant and thriving in its natural and translocated habitats. However, the species is characterised by slow growth, long generation times, high adult survival rate and low annual recruitment rates, and thus, abundance is not necessarily a reliable indicator of the population health of Australian Lungfish.

The ratio of males to females is believed to be 1:1 and Australian Lungfish spawn in their natural environment between August and December.

History of trade

Due to the restricted protection of Australian Lungfish, there was no commercial export of Australian Lungfish before 2002. However, there was evidence of substantial illegal trade, for example, the two shipments seized by Authorities in 1999. One shipment contained seven (7) individuals and was seized upon leaving Australia. The other shipment contained approximately fifty (50) finger length hatchlings and was seized by authorities on arrival in Japan.

In 2001, a private company [a third party] successfully bred Australian Lungfish in captivity. This subsequently resulted in an export of juvenile Australian Lungfish to Japan in September 2002 under restricted conditions.

The export of juvenile Australian Lungfish has continued after [a third party] sold the business operation in 2009.