# WILDLIFE TRADE OPERATION FOR HINTERNOOSA HATCHERY

## 1. Introduction

Hinternoosa Hatchery is a family owned fish hatchery operation which has been entrusted with the captive breeding programs of two of Australia's most endangered and threatened fish species, them being the Endangered Mary River Cod (Maccullochella mariensis) and the Threatened Australian Lungfish (Neoceratodus forsteri). The staff have been involved in the industry for a number of years and have successfully bred Mary River Cod for conservation stockings and have also been successful in captively breeding the Australian Lungfish. The purpose of this proposal is for Hinternoosa Hatchery to obtain reapproval to continue to operate as a wildlife trade operation, for the export of juvenile Australian Lungfish, which have been bred by Hinternoosa Hatchery. The brood stock utilized for the breeding program are collected in accordance with a Department of Agriculture and Fisheries (DAF) awarded General Fisheries Permit for Brood Stock Collection.

## 2. Statement and General Goal/Aims

The purpose of this application is for Hinternoosa Hatchery to have their business remain registered as a wildlife trade operation for the export of Australian Lungfish. The goal of the operation is to reduce the stresses on the wild population, which unfortunately still receive pressures from illegal trade. By introducing commercially bred fish onto the market, it will dramatically reduce these pressures, as the commercial stocks become more readily available. We have also been approached to supply research material to various educational facilities, which would have previously been sourced from wild stocks.

## 3. Harvest Details

All Brood Stock have been collected under a DAF approved Brood Stock Collection Permit. The Brood Stock have been collected using the approved collection methods and techniques, strictly adhering to industry best practice methods. The permit is valid till 31 March 2023, and a small number of brood stock will be collected in the coming years, to supplement the captive breeding program. The Brood Stock are to be housed in accordance with the hatcheries Development Permit.

## 4. Impact of harvest on the taxa and the relevant ecosystem

Under the guidance of the DAF approved Brood Stock Collection Permit, brood stock are only to be collected from populations that were translocated many years ago. The Lungfish's natural range is the Burnett and Mary River catchments, but part of the collection guidelines state that brood stock are only to be collected from the translocated populations of the Pine River Catchment and the Brisbane River Catchment, from below the Wivenhoe Dam wall to the Mount Crosby Weir, therefore, no impact is made on the wild remnant populations, and associated ecosystems.

## 5. Monitoring and Assessment

Under the conditions of the DAF approved General Fisheries Permit for Brood Stock Collection, Hinternoosa Hatchery must fill out a logbook and compile a comprehensive monthly brood stock collection report. This report also details capture methods used, and pest species etc captured. As the hatchery will only be using a small number of brood stock to breed from, and as these fish are sourced from a translocated population, we believe there isn't a requirement for further monitoring.

### 5.1 Has there been a resource assessment of distribution and abundance for the harvest area?

Department of Agriculture and Fisheries officers have carried out the required surveys on the fish populations, distribution and abundance of the collection sites. The officers have also surveyed the collection areas and collection techniques, which are stipulated in the approved General Fisheries Permit.

### 5.2 Will there be independent supervision of the harvesting?

The applicant will conduct the collection in accordance with the approved General Fisheries Permit. The permit does not require independent supervision, but we welcome any interested parties to be present, should they wish.

### 5.3 Outline the methods to be employed to monitor the harvesting of the specimens to identify whether the species or other species in the ecosystem are affected by the harvesting?

The harvest methods utilize DAF approved, industry best practice procedures and protocols, this combined with knowledge of the Lungfish habitat and habits, it is quite easy to target specific areas that are utilized by the fish. Once the fish are captured, they are quickly transported to holding tanks which have ample clean, oxygenated water. The brood stock are then transported, housed and monitored in accordance to Hinternoosa Hatchery's Development Permit.

### 5.4 Describe any other biological and environmental monitoring proposed for the harvesting area?

No additional biological and environmental monitoring is proposed, as the harvest sites are in the areas of the translocated populations, and they have been extensively studied by numerous agencies.

## 6. Management Strategies

Hinternoosa Hatchery envisage keeping a proportion of each year's offspring to grow out, and later utilize for future breeding stock. It is hoped, that in time, there will not be a requirement to source brood stock from external populations. We also believe that it is critical that selected hatcheries be able to develop the required techniques to be able to breed these magnificent fish, as there may be a need to repopulate certain areas in the future, if the need arises.

## 7. Compliance

Hinternoosa Hatchery will adhere to the stipulated details of the General Fisheries Permit. These conditions include all brood stock be PIT tagged and fin clipped, to allow DAF to determine the population where they were collected. All progeny are to be PIT tagged prior to sale and a sale invoice recording the associated PIT number to be issued upon sale. A comprehensive annual report is to be compiled for DAF annually, this will include production numbers, brood stock mortalities, if any, and specific brood stock collection activities. Only fish bred by the hatchery, using approved brood stock, will be available for sale.

Hinternoosa Hatchery has concurrently applied for the Australian Government Department of Environment to have their existing aquaculture operation registered as an approved aquaculture program, under the EPBC Act.

Hinternoosa Hatchery will also supply the Department with a list of the PIT tag numbers to be used on the progeny upon sale. This will allow the relevant authorities to easily monitor stock destined for export against the PIT tag inventory list.

## 8. Reports

An annual production report will be compiled for the Australian Government Department of Environment. This will include production numbers, and specimens exported and those to be retained onsite at the approved aquaculture facility. The report is to be made public, and further requirements can be added at the Department's discretion.

## 9. Background information

The Queensland lungfish (Neoceratodus forsteri), also known as the Australian lungfish is a surviving member of the family Neoceratodontidae and order Ceratodontiformes. It is one of only six extant lungfish species in the world. Endemic to Australia, the Neoceratodontidae are an ancient family belonging to the class Sarcopterygii, or lobe-finned fishes.

Fossil records of this group date back 380 million years, around the time when the higher vertebrate classes were beginning to evolve. Fossils of lungfish almost identical to this species have been uncovered in northern New South Wales, indicating that Neoceratodus has remained virtually unchanged for well over 100 million years, making it a living fossil and one of the oldest living vertebrate genera on the planet.

It is one of six extant representatives of the ancient air-breathing Dipnoi (lungfishes) that flourished during the Devonian period (about 413–365 million years ago) and is the most primitive surviving member of this lineage. The five other freshwater lungfish species, four in Africa and one in South America, are very different morphologically from N. forsteri. The Queensland lungfish can live for several days out of the water, if it is kept moist, but will not survive total water depletion, unlike its African counterparts.

Queensland lungfish are olive-green to dull brown on the back, sides, tail, and fins, and pale yellow to orange on the underside. They have been described as having a reddish colouring on their sides which gets much brighter in the males during the breeding season. This colouration is the only distinguishing sexual characteristic of the lungfish. They have stout, elongated bodies and flattened heads with small

eyes. The mouth is small and in a subterminal position. The lungfish can grow to a length of about 150 cm, and a weight of 43 kg. It is commonly found to be about 100 cm and 20 kg on average. Both sexes follow similar growth patterns, although the females grow to a slightly larger size. They are covered in slime when taken from the water.

Juveniles have different body proportions from mature adults. The head is rounder, the fins are smaller, and the trunk is more slender. The mouth is initially terminal, but shifts back as the fish grows. The dorsal fin typically reaches to the back of the head in young juveniles, and gradually moves caudally until it only extends to the mid-dorsal region in adults. They show a gradual change in body form as they develop, but no metamorphosis is externally detectable, and no obvious point occurs at which they can be termed adult. As a juvenile, the lungfish is distinctly mottled with a base colour of gold or olive-brown. Patches of intense dark pigment will persist long after the mottling has disappeared. Young lungfish are capable of rapid colour change in response to light, but this ability is gradually lost as the pigment becomes denser.

The Queensland lungfish is native only to the Mary and Burnett River systems in south-eastern Queensland. It has been successfully distributed to other, more southerly rivers, including the Brisbane, Albert, Stanley, and Coomera Rivers, and the Enoggera Reservoir in the past century. The Queensland lungfish has also been introduced to the Pine, Caboolture, and Condamine Rivers, but current survival and breeding success are unknown. Formerly widespread, at one time at least seven species of lungfish were in Australia.

This species lives in slow-flowing rivers and still water (including reservoirs) that have some aquatic vegetation present on banks. It occurs over mud, sand, or gravel bottoms. Australian lungfish are commonly found in deep pools of depths between 3 and 10 m and live in small groups under submerged logs, in dense banks of aquatic macrophytes, or in underwater caves formed by the removal of substrate under tree roots on river banks. The lungfish is tolerant of cold, but prefers waters with temperatures between 15 and 25 °C.

The Queensland lungfish is incapable of surviving complete desiccation of its habitat, although it can live out of water for several days if the surface of its skin is constantly moist.

The Queensland lungfish is essentially a sedentary species, spending its life within a restricted area. Its home range rarely extends beyond a single pool or, occasionally, two adjacent pools. It does not follow a set migratory path, but may actively seek out suitable spawning habitats between July and December.

Australian Lungfish export trade is still very much in its infancy. In 2002 fish were legally exported by the original producer, who was situated in Howard, Qld. There have been numerous illegal attempts of trade made throughout the years, and this is the type of trade we believe will be eliminated with the approval of Hinternoosa Hatcheries wildlife trade operation.

References: Wikipedia; Retrieved 16.1.17