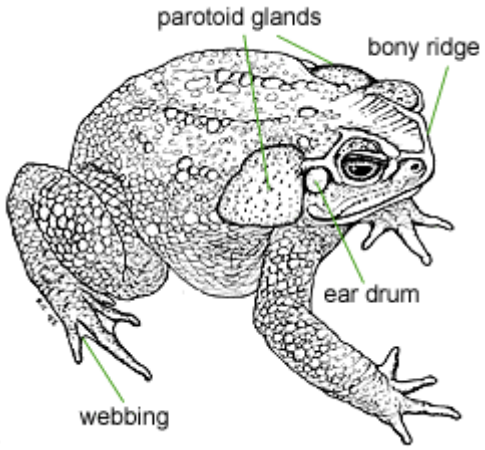
DISCUSSION PAPER

A Tourism Nightmare

Potential Social, Cultural and Environmental impacts caused by the introduced feral predator the Cane Toad (Bufo marinus) on the Kimberley Region of Western Australia



Prepared by Russell Guého – Northern Habitat (08) 91 925 275
email: northernhabitat@westnet.com.au

Introduction

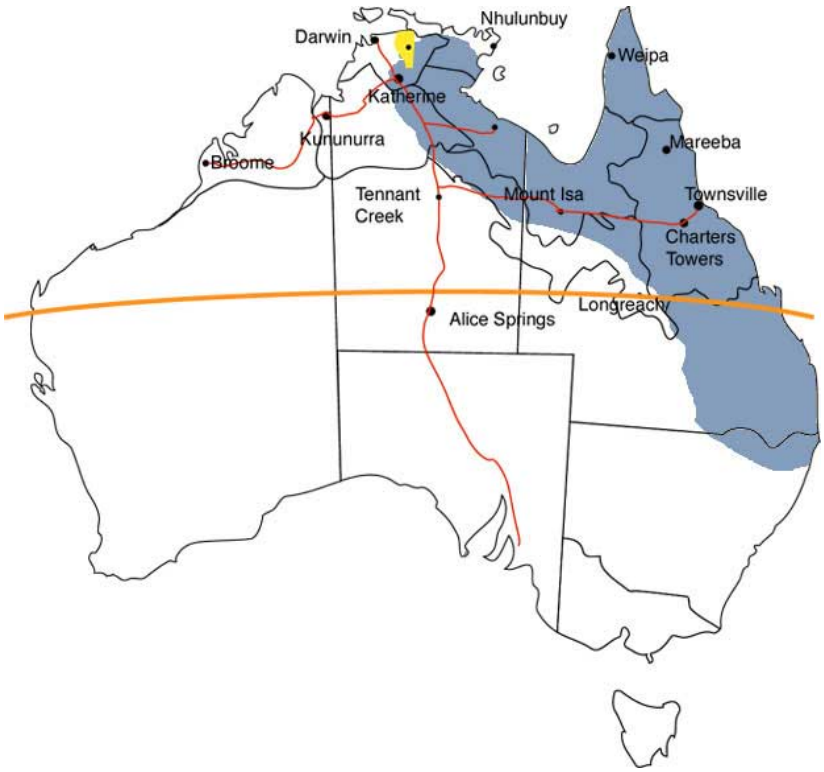
Cane Toads are less than 300 kilometres from the Kimberley town of Kununurra and the world-class RAMSAR wetlands of Lake Argyle, Lake Kununurra and the Ord River and potential impacts, upon the special habitats of Western Australia, are causing much speculation.

It is a sad irony that although this species has been creating havoc across Queensland and the Northern Territory there is still very little information, apart from anecdotal accounts, as to their long-term effect on native wildlife.

Why is this the case? Why have no long-term inventories of National Parks, pastoral lands or Aboriginal lands been able to demonstrate that there is an impact?

In the case of Queensland it could be argued that minimal baseline inventory data existed before the cane toads began their destructive invasion so many species were no doubt lost before they could be identified as being at risk. *It is most likely that a whole generation of Queenslanders have grown up not realising what natural heritage they have lost as a result of the introduction.*

In the Territory baseline data for areas such as Kakadu and Arhnem Land does exist but the speed of the invasion has left wildlife managers playing constant catch-up without adequate resourcing to determine present and generational impacts.



Present cane toad distribution

In 1935 about 101 Cane Toads were deliberately introduced from Hawaii in an attempt to control grey backed cane beetles that were considered pests of the sugar industry in Queensland. This is despite the fact that that the beetles lived on the cane stems and their larvae in the soil where they were, and to this day still are, inaccessible to the toads.

All attempts to use cane toads for controlling pests have been failures – in the Philippines, cane toads were introduced to kill rats. Instead, they poisoned the village cats and rat numbers soared.

The agency responsible for the Australian introduction was the Bureau for Sugar Research (Meringa Sugar Research Station) and the resulting failure and consequences of this introduction has become legendary in Australia.

Cane Toads are now found from northern and central coast areas of New South Wales through sub tropical Queensland and into the Northern Territory extending west at least as far as Katherine and north to the outskirts of Darwin. The potential range of habitats that they could occupy in Australia includes all coastal areas of the mainland states and in Western Australia from Geraldton to Esperance

They are most abundant in urban areas, grasslands and woodlands but can also be found in a range of habitats including sand dunes, coastal heath, mangroves and through the margins of rainforest. Cane Toads are extremely adaptable feral pests that possess the undeniable ability to detrimentally modify any habitats that they enter.

Identification

Cane Toads are large heavily built amphibians with dry warty skin. They may be grey, yellowish, red or olive- brown with pale mottled bellies.

On average their size as adults can range from10-15 cm in length, although a 24 cm 1.3 kg female has been recorded from Queensland. Two large glands, the parotoid glands, are located on each shoulder behind the eardrum. These glands produce toxic venom (used as a defensive mechanism) in great quantities that is lethal to most species of native wildlife.

All stages of the creatures lifecycle is venomous to some degree from the eggs to the tadpoles to juvenile and adult toads.

Cane Toad spawn is unique in Australia. It is laid in long strands of transparent jelly that encloses double rows of small black eggs – these strands tangle in water plants and hangs in ropy strands if picked up.

The tadpoles are shiny black with a short thin tail and plain dark underbelly and they gather in huge numbers in shallow water areas. Smaller than most native tadpoles they are none the less extremely voracious at this stage of development.

Cane toad eggs

Young cane toads lack the distinctive parotoid glands of the adults but they can be distinguished from some of the native Australian frog species as they gather in large active clusters during the daytime with an upright sitting habit.

Juvenile cane toad

Habits and Reproduction

Adult Cane toads are active, particularly at night, during the warmer months of the year in northern Australia. During cold and dry periods they shelter wherever they can find moisture – in crevices, under logs, rocks and other debris. Adults can lose more than 50% of their body water and absorb replenishment through their skin from damp soil or humidity.

They can tolerate a wide temperature range from 5 – 40 degrees Celsius and they can eat almost any animal, provided it is not more than half their own body length. In Australia they have been recorded eating mice, birds, lizards, frogs, crabs, spiders, ants, beetles and earthworms and each other.

They are incredibly prolific breeders with large females having been recorded producing in excess of 35000 eggs at a time and these are capable of surviving in freshwater systems and brackish systems where salinity levels are up to 15%.

Cane toad eggs

If they can get to water they can breed all year round in northern Australia and their speed of reproductive capability is very rapid.

Eggs can hatch in two days and tadpoles can metamorphose into juvenile toads within 16 days and these can become sexually active within one to two years if conditions are optimum.

Impacts

Certainly there are many observations made indicating that both native predator and prey species become rare when cane toads reach a new area, particularly in the first few years after their arrival.

There is evidence of local extinctions occurring as a direct result of cane toads eating or poisoning native animals.

So do people in the Kimberley need to be concerned? The answer is a resounding yes.

Agencies that are charged with protecting and conserving Western Australia's natural heritage appear to have adopted a laissez-faire attitude to dealing with the problem.

There is a hope and see attitude prevalent that misses the multitudes of points totally.

If this feral predator impacts on the Kimberley in the manner that can be forecast from its impacts on other parts of Australia then there are likely to be far greater effects in the short to mid term that may have unwanted outcomes for generations to come.

Not only will there be massive environmental effects but the development of unwanted social and cultural impacts also.

- Many people are directly employed in nature based tourism industries throughout the region – but if there is an immediate impact on the resource which directly attracts tourism visitors to the region then what is to stop these visitors changing their destination requirements if the attraction has disappeared?

- Reduced visitation will directly impact across a wide range of services and it is not completely abstract to suggest that employment and social directions could be directly affected.

- Aboriginal people will suffer as there are effects on the resources that they have traditionally used for thousands of years – fish, turtles, crocodiles, small mammals and the plant resources that rely on these animals to maintain genetic diversity could all potentially suffer with downstream social, health and cultural impacts that are difficult to determine.

At the very least there should be an acceptance that as this is a man made issue of management then management strategies should at least be developed to ensure that some form of response is achievable.

Adult cane toad

Marble Frogs suffer from mistaken identity

Although the problems associated with cane toads have been observed for almost 70 years control attempts have been few and far between.

Certainly the most promising is research currently underway to develop a biological control to interrupt the cane toad reproductive cycle – but results are a long way from being determined.

Another possible research direction is to identify the use of pheromones as a potential control method.

There are many questions that require answers and these include;

- Conservation issues,
- The potential impacts on native frogs and freshwater fish,
- The removal of insect and wildlife linchpin species,
- The long-term impacts on pollinators of bush-tucker plants that are used extensively in Aboriginal cultural activities.

When cane toads reach the Victoria River in the Northern Territory they are effectively within the watershed range that extends to the line on the map that separates the NT from WA.

These creatures don't recognise this line the way that we do and once into the Victoria River they can access the West Baines River, the Keep River and then eventually the Ord River and the agriculture and tourism dependent town of Kununurra.

When they reach the Ord it will only be a short hop for them to cross into the Fitzroy River and reach Derby and shortly thereafter the tropical haven of Broome.

One can only imagine what the impact will be upon this resort town when the restaurants, hotels and swimming pools become hazardous areas, and the wetland and mound spring fauna of this area are devastated by the presence of these creatures.

- Why would people want to come?
- What will happen to the service industries that support these tourism towns
- What social and cultural effects will be felt?
- And what respect will remain for management agencies that appear to have very little to contribute?

Indeed, it has been suggested in some quarters that litigation should be undertaken against the sugar industry and the government policies that have ignored this feral threat for too long.

- At the very least a serious approach to identifying strategies to deal with impacts that are manageable should be undertaken – not a talkfest – but the basis of a flexible physical plan to reduce the long-term effects of these creatures on Kimberley habitats until such time as an appropriately researched and tested response can be developed.
- Appropriate funding from all areas of industry and government to resource physical control (including quarantine arrangements) and provide time for a scientific response to occur should support this strategic planning.
- An environmental levy of several dollars per visitor with a matching agreement from industry and government and tax relief/exemption status would allow research funding to commence immediately.

If the present attitude of "*suck and see*" continues then it is impossible to determine what the long term diversity – both species and gene pool – will eventually become. This attitude can only result in species loss and long term effects that will be a burden of legacy that we as a species should not find attractive.

What could be Lost

Cane toads are an aggressive predator of many small vertebrate species that are unique to the Kimberley region. Combined with a highly toxic and biologically active substance produced by the parotoid glands and the presence of toxins in the toad's muscles, bones and body organs (as well as in their eggs and tadpoles) makes the cane toad a very efficient killing machine.

History has shown in both Queensland and the Northern Territory that localised extinctions of many creatures are the norm.

Many native predator species have died from contact with cane toads. A bird list of potential species affected would include –

- Wading birds such as egrets and herons, bitterns, cormorants and darters,
- Raptors including harriers, goshawks, kites, kestrels and falcons and osprey.
- There are potential impacts on near water species including crakes, rails, native hens, cranes, storks, bustards, stone curlews and Jacanas.
- In coastal areas oystercatchers and plovers and some migratory wader species, ibises and spoonbills will be impacted upon.
- Woodland and near wetland species including owls, kookaburras and kingfishers, babblers, warblers, larger honeyeaters, cuckoo-shrikes, butcherbirds, crows, magpie-larks and magpies,
- and in rainforest margins perhaps even the magnificent pittas will suffer.

Other fauna known to be affected include-

- Both species of crocodiles,
- Water monitors and other varanids,
- Freshwater turtles,
- Frilled lizards, northern blue-tongues,
- Pythons and other snakes – several of these are also protected under international treaties – the potential losses are unknown but will be significant.
- There is much evidence that populations of Northern Quolls are devastated immediately following contact with cane toads along with other small carnivorous mammals.

Very little is known about effects on invertebrate fauna apart from evidence that many species are used as a food source – this unknown quantity causes all sorts of problems when considering impacts.

It raises questions of competition between native frog species and the cane toad and the long-tern food chain impacts that can only be speculated upon but in itself should not be used as an argument for doing nothing.

Death Adder poisoned by cane toad

All of the offspring of these animals are also at risk – eggs, hatchlings, all are food for cane toads.

What impacts may occur to our native fish species? Barramundi is a top predator and a sought after table and sportfish – does the potential exist for this species to be affected by cane toads by accumulating toxins and becoming unpalatable in the long term? Could the advance of cane toads influence the barramundi populations?

There is evidence that this feral pest has impacted upon other tropical freshwater fish and eel species but as with most information on these effects the research required to obtain solid data often takes far longer to achieve than the time that is available to cause any tangible, workable results.

A Northern Territory Legislative Assembly report on the issues associated with the progressive entry into the Northern Territory of cane toads has indicated an extensive range of fish species may be affected.

This report has also highlighted the devastation caused to other native fauna and identified that issues exist in respect of social, environmental, indigenous and cultural activities.

Several recommendations of value were proposed through this report, but it is unlikely that many have been adopted given the snail pace of bureaucracy –

- Identification by the Federal Government that a threatening process was underway as described in the Environmental Protection and Biodiversity Conservation Act 1999.
- Reclassifying cane toads into the “menace” category under the Environmental Protection and Biodiversity Conservation Act 1999.
- The identification that the issue required government and industry cooperation and collaboration.

- Offshore islands should receive extra protection as storehouses of biological material.
- That construction of man-made barriers around man-made cane toad breeding sites (sewerage ponds, shire water features etc) should be undertaken.
- That the three tiers of government should be involved in control activities,
- That the NT Government approach the Western Australian Government to reach agreement for establishing a co-ordinated approach to research and control programs

While we wait the long-term loss of genetic diversity could be devastating.

The end result of all of this discussion is that we just don't know what the impacts will be. But this should not preclude us from making a serious effort to find a biological or physical control.

To achieve this end will require a lot of resources – at the end of the day the voters of Western Australia and Australia should make their feelings known to existing and aspiring politicians.

The Kimberley is worth saving – unlike other parts of Australia where cane toads have established, the obvious extent of their impact on wildlife and habitats *can be* separated from other destructive impacts due to increasing human population, clearing and degrading of native vegetation, pollution of waterways and the spread of other introduced plant and animal species.

Make your thoughts known to industry associations, political aspirants, members due for re-election, environmental associations, your departmental policy makers or forward your response to Northern Habitat where we will collate, analyse and forward your thoughts to relevant groups.

Recommended reading.

Report No.1 2003 Legislative Assembly of the Northern Territory – issues associated with the progressive entry into the Northern Territory of cane toads.

This document was prepared using a number of sources of information including

Landscope Vol 18, Number 3, Autumn 2003 pp10-15 Start. T and Done. C

1. Learn about the introduced species of **Cane** Toad, and how it is affecting the Australian environment.
   www.qmuseum.qld.gov.au/features/frogs/canetoad.asp

2. Learn about this introduced pest with a fact sheet. Includes a photo, links and details of why this animal is bad for the Australian environment.
   faunanet.gov.au/wos/factfile.cfm?Fact_ID=284

3. Find a detailed profile and photos of this species that was introduced in Australia from Hawaii in 1935 to control scarab beetles.
   www.austmus.gov.au/factsheets/canetoad.htm

4. The Bufo marinus was introduced 1935 to control **cane** beetles, without success and has become a pest in it's own right by poisoning water supplies and habitats. www.geocities.com/gem3007/bufmarin.htm

5. **Cane Toads** Residents in other parts of Australia have been living with **cane toads** for many years. This information is for people in Darwin and rural communities to give an idea of what to expect ... ... We are unsure whether **cane toads** also compete with, and so reduce the populations of native **frogs**. ... www.nt.gov.au/ipe/pwcnt/index.cfm?attributes.fuseaction=open_page&page...