



TROPICAL SAVANNAS CRC

Cooperative Research Centre for Tropical Savannas Management

Predicting the impact of cane toads in Kakadu



The cane toad, pictured above, was first reported in Kakadu National Park in 2001. The park covers around 20,000 km² and has a rich variety of plants and animals. The toxicity of the cane toad has been a major cause for concern and recent research has shown some mammals have declined at an alarming rate since the toad's incursion.



MISSION:

To achieve sustainable use and conservation of Australia's tropical savannas through excellence in collaborative research, communication and education

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Cane toads (*Bufo marinus*) entered the Northern Territory (NT) in 1980 from Queensland. Concern about the invasion of cane toads in Kakadu National Park resulted in an ecological risk assessment to "predict the likely extent of impacts of cane toads in Kakadu National Park and identify key vulnerable habitats and species." ¹ Cane toads were first reported in Kakadu in January 2001.

Kakadu

Kakadu National Park is 20,000 km² with an extensive network of rivers. The park's

landscape ranges from tidal estuaries with mangroves and beach, floodplains that are seasonally inundated, pockets of monsoon forest, lowlands of open eucalypt forest and lagoons to the deeply dissected sandstone country with deep gorges, waterholes and dense pockets of rainforest. This varied landscape creates diverse habitats allowing for a rich variety of plants and animals.

Kakadu experiences monsoonal weather, with a wet season changing through a number of seasonal transitions to an

Adapted from a preliminary risk assessment of cane toads in Kakadu National Park by R.A. van Dam, D.J. Walden, & G.W. Begg.



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extended dry season. Kakadu is of great conservation value internationally due to the rich biodiversity of its flora and fauna.

Potential spread of cane toads

The Top End of the Northern Territory, including Kakadu National Park, has the ideal bioclimatic conditions for the prolonged cane toad breeding.²

Cane toads are vigorous and successful colonisers. Cane toads will use waterways and transport corridors to disperse to new areas. When the conditions are right they will quickly take advantage of available water to breed rapidly and prolifically.

Effects of cane toads in Kakadu

The toxicity of the cane toad has been a major cause for concern. The potency of the cane toad toxin renders it lethal to most frog-eating vertebrates and any other animal that might try to ingest it.

The long-term effect of cane toads on predators is not yet clear.

It is generally acknowledged that a variety of predators will die if they mouth or ingest toads. There have been no long-term studies to investigate if predators will recover or go into decline and or become extinct.

While a few species appear to be immune to the cane toad's toxin or feed in a manner that avoids the poison, there are many potential cane toad predators in Kakadu that are susceptible to cane toad toxin.

There are five species of lizard and three species of snake that have been listed as definitely susceptible. There are recent convincing anecdotal reports about freshwater crocodiles (*Crocodylus*

CANE TOAD FACT FILE



- Introduced to Australia in 1935 to control sugar cane pests in Queensland.
- One of the largest toads in the world, some females reaching up to 230 mm in length and 1.25 kg in weight.
- Nocturnal habits, sheltering during daylight.
- Need water to drink or moisten skin at least every two days.
- Have an amphibian life cycle of egg–tadpole–juvenile–adult–egg.
- Are rapid colonisers preferring open habitats, disturbed areas and degraded natural habitat.
- Omnivorous, eating a wide variety of prey including their own young.
- Have a high fecundity, particularly in warmer waters with larger females laying up to 36,000 eggs.
- Adapt to a wide range of different habitats.
- Possess highly toxic predator defences seen as protuberant glands behind the ears.

johnstoni) dying after eating cane toads.

While there are many birds that are potentially under threat there is no substantial evidence to suggest the whole species is endangered by the





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advent of cane toads. Recent research has shown that some mammals in Kakadu National Park including the northern quoll and northern bandicoots have declined at an alarming rate.

Knowledge gaps

The effect of cane toads on many of its predators is clear. There remain many areas of uncertainty about the impact of cane toads in Kakadu.

The extremes of temperature and the monsoonal climate make it difficult to predict final cane toad density.

The effect of the fire regime in the park may help or hinder cane toad population and dispersal.

Due to strict feral animal control and land management Kakadu National Park has less land disturbance than areas previously colonised by cane toads.

There is a lack of research on the long term impact of cane toads on populations of animals.

Queensland Experience

Anecdotal evidence from Queensland has indicated that northern quolls (*Dasyurus hallucatus*) (as well as various monitor lizards species) decline rapidly when cane toads arrive in their area.

Predatory fauna species in Kakadu National park definitely susceptible to cane toads

Classification	Common Name	Scientific Name
Class Mammalia	northern quoll	<i>Dasyurus hallucatus</i>
Class Mammalia	dingo	<i>Canis familiaris dingo</i>
Class Mammalia	feral cat	<i>Felis catus</i>
Class Reptilia	Gould's or sand monitor	<i>Varanus gouldii</i>
Class Reptilia	mangrove monitor	<i>Varanus indicus</i>
Class Reptilia	Merten's water monitor	<i>Varanus mertensi</i>
Class Reptilia	northern sand monitor	<i>Varanus panoptes</i>
Class Reptilia	spotted tree monitor	<i>Varanus scalaris</i>
Class Reptilia	northern death adder	<i>Acanthophis praelongus</i>
Class Reptilia	king brown snake	<i>Pseudechis australis</i>
Class Reptilia	western brown snake	<i>Pseudonaja nuchalis</i>

Monitoring program proposal

Seven distinctly different habitat types have been selected for monitoring in Kakadu National Park, including floodplain communities, swamp communities, monsoon forest, springs and forest.

Monitoring the northern quoll among a range of small mammals, reptiles and birds has also been made a priority.

Footnotes

- ¹ van Dam RA, Walden DJ & Begg GW 2002 A preliminary risk assessment of cane toads in Kakadu National Park. Scientist Report 164, vii
- ² Jacklyn, P. 1992. The status of cane toads in the Northern Territory: a final report for the ECNT November 1992.

TS-CRC PARTNER ORGANISATIONS

The Tropical Savannas CRC (TS-CRC) is an unincorporated joint venture established by an Agreement between the Commonwealth of Australia and the following parties: Charles Darwin University | CSIRO: Land & Water; Sustainable Ecosystems | Department of Agriculture WA | Department of Conservation WA | Director of National Parks | James Cook University | Meat and Livestock Australia | North Australia Beef Research Council | North Australia Indigenous Land and Sea Management Alliance | NT Department of Business, Industry and Resource Development | NT Department of Infrastructure, Planning and Environment | Queensland Department of Natural Resources & Mines | Queensland Department of Primary Industries | Queensland Parks & Wildlife Service | University of Queensland |

