



History of Crocodile Management in the Northern Territory of Australia: *A Conservation Success Story*

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Ancient Relationships

Aboriginal people are the largest landowners in the Northern Territory, with many living in remote communities, where traditional lifestyles still dominate social values and economic development. In the coastal areas of the Northern Territory's "Top End", Aboriginal people have coexisted with saltwater crocodiles (*Crocodylus porosus*) for around 65,000 years. They hunted and ate crocodiles and their eggs, while at the same time being hunted and preyed upon by crocodiles. Aboriginal people attribute many different values to crocodiles, for intrinsic, cultural, spiritual and utility purposes. Crocodiles and Aboriginal people have adapted to past climate change events, including sea level rises of 100-150 m.

European settlement of the Northern Territory is recent – only 200 years or 0.3% of the period of Aboriginal occupation. Early European surveyors and settlers saw crocodiles as pests - fair game for opportunistic sport hunting. But there were few settlers, and many of the wetlands occupied by crocodiles were remote, inhospitable and logistically difficult to access. The impacts of early hunting on the wild crocodile population were minor.



The hunter-gatherer lifestyle of many Aboriginal people has existed from 65,000 years ago to the present time (Bill Green).



Killing an "alligator" on Horse Shoe flats, Victoria River (Thomas Baines 1855) (Photograph: courtesy of the Kerry Stokes Collection, Perth)

Commercial Hunting



There were an estimated 100,000 wild saltwater crocodiles when commercial crocodile hunting intensified in the late 1940s. By 1958, it is estimated 87,000 wild skins had been exported from the Northern Territory (unknown photographer).

In 1946, when high demand for crocodile fashion leather re-emerged after WWII, the Northern Territory was still sparsely populated. The capital city, Darwin, contained around 2000 “white” people. Local entrepreneurs began commercial hunting of crocodiles for skins, within rivers and creeks around the coast, and in coastal floodplain swamps. Eradicating crocodiles was legal and still viewed as a social good. Crocodile hunting was welcomed as a new and novel industry within a remote frontier, where options for economic development were limited by small population size and the tyranny of distance.

By the 1960s, many more people lived in the “Top End” (15,000 in Darwin), but the 15 years of unregulated hunting had made crocodiles scarce. By the end of the 1960s (35,000 people living in Darwin), few professional crocodile hunters remained. The wild crocodile resource was gone in most areas, despite wetland habitats being largely intact. Crocodile hunters, rather than conservationists, were the first to ask Government to “save” saltwater crocodiles, to ensure their mutual survival.

Changing “Social License”

Within Australia, and globally, public interest in avoiding wildlife extinctions gained momentum in the 1960s. The IUCN Red Data Sheets started to be published in 1963, with eminent scientists giving dire warnings that excessive, unmanaged harvesting of wildlife was causing species extinctions. Crocodiles were a much cited and poignant case history. The spread of television enhanced public and political awareness and concerns. The “social license” for crocodiles nationally, in Australia, gradually changed from eradication to protection and conservation.

Protection

When saltwater crocodiles in the Northern Territory were protected (1971), they were rarely sighted anywhere. A wild population of around 100,000 individuals had been reduced to 3000-5000. Even in Darwin, where crocodiles were known to be dangerous predators, the public did not oppose protection – saltwater crocodile attacks on people had become a thing of the distant past. Some scientists were genuinely concerned that the biological capacity of the remnant population to rebuild had been lost, and they may go extinct anyway.

Science and Research



The research program initiated by Professor Harry Messel in 1971 was pivotal in increasing the scientific knowledge about saltwater crocodiles. A dedicated research vessel allowed all coastal rivers to be accessed so crocodile spotlight surveys could be undertaken. Amongst many research programs was the development of a new head-mounted radio-tracking transmitter to study movements (Bill Green).

There had been little formal research carried out on crocodiles during the hunting period. In 1971, Professor Harry Messel from the University of Sydney, in cooperation with the Commonwealth and Northern Territory Governments, initiated one of the largest research programs on crocodiles ever undertaken globally. The program allowed Australian biologists, including Grahame Webb, to start seriously researching crocodiles. One of the first questions addressed was: *how many crocodiles are left?* A standardised survey and monitoring program was implemented in 1975, in all rivers and creeks of the “Top End”, and that monitoring program continues today. It provides a 45-year history of how the depleted population of saltwater crocodiles recovered

In the early 1970s, the few remaining adults, despite being wary and well-hidden, continued to breed. So the remaining wild population of some 3,000-5,000 animals was mainly made up of hatchlings, with very few adults. Each year new cohorts of hatchlings and juveniles were added, so that by 1979-80, despite larger crocodiles eating and displacing smaller ones, it was unequivocally

clear that “protection” was working. The population had increased 900% in abundance - 30-40% of the original population recovered. Crocodiles born since protection (1-9 years old; up to 3 m in length) were more common than they had been since the late 1940s. But they were still juveniles, and 4-5 more years would be needed before they matured and could breed themselves.



Hatchling saltwater crocodiles (Grahame Webb).

The Political Dimension

With self-government of the Northern Territory (1978), investment and business confidence boomed. Tourism was actively promoted, and crocodiles emerged as a “must see” wildlife icon. In 1979, the first crocodile farm was established by local business entrepreneurs, for both tourism and crocodile skin production through captive breeding.

By 1980 (60,000 people in Darwin), water-based recreation was becoming dangerous because of crocodiles. Both Aboriginal and non-Aboriginal landowners were being adversely affected by the increasing numbers of crocodiles, and were wearing the “costs” of the public decision to rebuild crocodile numbers. There were fatal and non-fatal attacks, and public support for the ongoing expansion of the wild crocodile populations began to wane.

If the population recovery was to continue, with public support, new reasons for people to value crocodiles were needed. With American alligators in Louisiana (USA), a similar problem had occurred, and it was solved with an “incentive program”. The authorities gave landowners permission to harvest and sell some alligators, from their lands, in a highly regulated program ensuring the harvest was sustainable. The application of this model to the Northern Territory depended on two key questions:

- (a) Could a conservative and modest harvest of saltwater crocodiles be sustained biologically by the recovering population? And;
- (b) If landowners could generate an income from saltwater crocodiles, would they view crocodiles and the wetlands they occupy as assets rather than liabilities?



Saltwater crocodiles have become a “must-see” icon for tourists visiting the Northern Territory (Grahame Webb).

Introduction of Harvesting



Saltwater crocodile nest within a freshwater swamp (Grahame Webb).

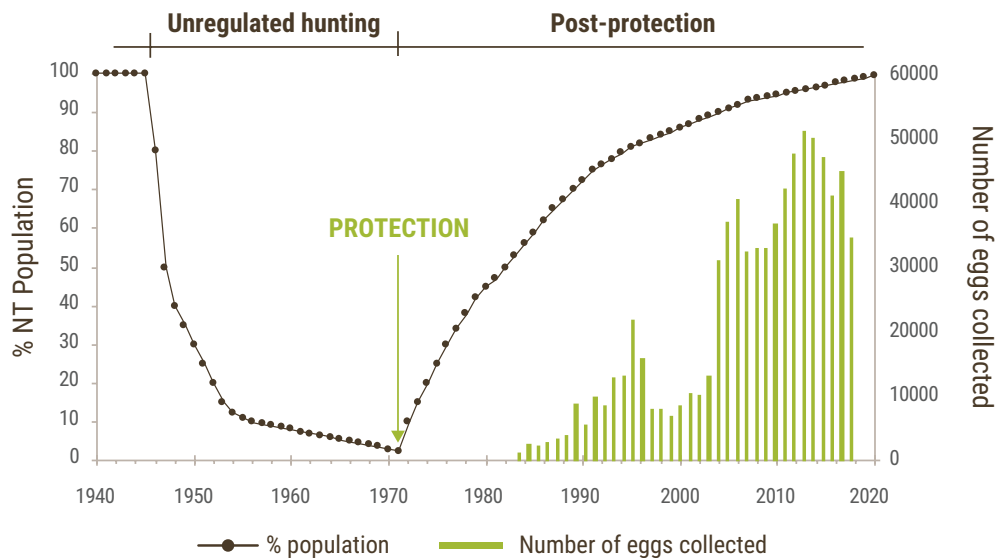
An experimental wild egg harvest (ranching) was introduced in the Northern Territory in 1983. Landowners were permitted to collect and sell wild crocodile eggs to the three crocodile farms established at that time. The farms could raise the crocodiles and sell skins internationally, to the high fashion and luxury goods markets. The more eggs and nests on private lands, the more income generated, and the greater the incentive for landowners to tolerate and conserve crocodiles – an animal previously viewed only as a threat to people and livestock.

The global consumers of luxury crocodile products were driving the whole supply chain. Perhaps unknowingly, they were the most important partners in the program conserving both wild crocodiles and the wetlands in which crocodiles live. They were also improving the livelihoods of rural people, including Aboriginal communities, living with crocodiles in remote areas.

However, the proposal to harvest crocodiles met serious opposition from urban-based conservation groups, activists and some researchers, nationally and internationally. They did not understand or have sympathy for the local context, and were predicting the program would fail and that crocodiles would go back to the brink of extinction. They were wrong.

The new harvest program was designed to ensure landowners were key beneficiaries of the conservation program, and not unwitting and unwilling victims of the success being achieved. Stewardship of the wild crocodile population and their wetlands will ultimately depend on landowners, regardless of well-meaning laws and policies. Today, most landowners in the Northern Territory accept that crocodiles are a resource they can benefit from – despite having to deal with problems crocodiles cause from time to time.

Status of Wild Population Today



The Northern Territory saltwater crocodile population, protected in 1971, has recovered to its original abundance with no adverse impact of harvesting eggs annually since 1983 (compiled by Sally Isberg).

Today, Darwin's population is around 130,000 people, and it is now 50 years since crocodiles were protected (1971). The many doomsday predictions about harvesting wild eggs for commercial farming, were clearly unfounded. The crocodile population has increased in abundance by 20-fold (2000%), and in biomass by 100-fold (10,000%). Adults are once again abundant. The harvest did not even slow the recovery rate. Crocodiles now occupy their full historical range in the Northern Territory. For a serious predator on people, this is the epitome of successful conservation.

The Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) have continually supported the Northern Territory's program. The conservation credentials coming from this success have resulted in international investment by the world's top luxury brands. The crocodile industry (11 farms in 2020), landowners, regulators, researchers and the community – Aboriginal and non-Aboriginal – all have a strong vested-interest in maintaining an abundant, wild crocodile population, living in natural wetlands and rivers. No better prerequisite for the successful long-term conservation of crocodiles can exist, and it assists all the other wetland animals using the same habitats.

IUCN & CITES

IUCN: International Union for Conservation of Nature. Formed in 1947, based in Switzerland with UN Observer status. The world's largest, science-based, consortium of conservation organisations (1300 member organisation both state and non-government). Includes the Species Survival Commission (SSC) with 9000+ scientists providing IUCN with evidence.

IUCN-Red List of Threatened Species: A flagship IUCN product, which tracks the status of global wildlife and is informed by SSC scientists.

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora. Came into force in 1975 and now has 183 member countries. Parties to CITES adopt agreed procedures for regulating international trade in plants and animals, to ensure uses are legal, sustainable and verifiable and do not threaten species with extinction.



In addition to traditional knowledge and skills, engagement of Aboriginal people in the crocodile industry has involved training with eggs, embryos and incubation technology (Grahame Webb).

Lessons Learned

Saltwater crocodile conservation in the Northern Territory has involved innovation, risk, tenacity, pragmatism, science, adaptation, changing political leadership and priorities, bold investment and bold decision-making. Each change in policy has been evidence-based, because a significant investment in scientific research was made by government and the private sector. The pioneering research on wild and captive crocodiles, and their recovery and active management in the Northern Territory, over 45 years, has provided an invaluable knowledge-base that has helped other Australian states and countries to better conserve and manage their crocodile populations. Indigenous Aboriginal communities, living in remote areas, have been key beneficiaries, and options for increasing their involvement on homelands, possibly through satellite farms, are now being explored. The IUCN-SSC Crocodile Specialist Group (CSG), whose members (680 in 70 countries) are involved with most crocodile conservation programs worldwide (27 species across 99 countries) has been based in Darwin since 2004.

If there was an anachronism recognised, it was that the biggest threat to crocodiles was the success of the conservation program. Rebuilding depleted wild populations of predators reinstates attacks on people, which creates public and political pressure to reduce the populations again! That decision-makers need to prioritise public safety over biodiversity conservation is as old as humankind itself. In the Northern Territory, commercial incentives, education programs, a problem crocodile removal program, a vibrant crocodile farming industry, and global leadership in crocodile research, have all helped sustain public and political support for crocodile conservation, despite occasional setbacks. A single focused vision has prevailed for 50 years - conserving wild saltwater crocodiles and their habitats requires respect for local peoples and their values, and the tailoring of management to meet their needs. Even if it does occasionally ruffle the ideological feathers of distant people in distant lands.



AUTHORS NOTE: The content of this document, including text and photographs, was extracted from “Webb, G.J.W. (2020). *Northern Territory Saltwater Crocodiles: Past, Present and Future*. Wildlife Management International: Darwin” as an information document, for the Crocodile Farmers Association of the Northern Territory (CFANT). This publication contains a photograph of a highly valued but deceased Aboriginal friend, and I apologise if it causes offense to any family members.