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Benjamin – last known living Thylacine, Hobart Zoo.

The Thylacine *cephalinus*, also called Tasmanian Tiger, was one of the most misunderstood carnivores of our time. Accused of the ruthless mass-killing of farmers' sheep this shy nocturnal creature got a bounty put on his head by the Tasmanian government and was hunted to extinction before it could be properly studied.

My purpose with studying these articles was not only to understand why there is so little information about this magnificent species but also to take part in the controversy of the cloning project and the latest believes that it is actually **not** extinct.

Introduction

Kingdom: Animalia

Phylum: Chordata

Class: Mammalia

Order: Dasyuromorphia

Family: Thylacinidae

1 <http://commons.wikimedia.org/wiki/Thylacine>

←²

Thylacinus cynocephalus – bluntly translated “dog headed-pouched dog”³ was a marsupial carnivore indigenous to mainland Australia and Tasmania around 3300 y. ago, before the introduction of the Dingo and epidemic diseases restricted its existence to Tasmania.

An adult animal could weigh between 15-30 kg and measure round 6 ft from the tip of the tail to nose⁴. With large black stripes from the base of the tail, over the rump and almost up till its shoulders this shy nocturnal creature inhabited Tasmanias west coast and inland down to Macquarie Harbour⁵.

European settlers first set foot on Tasmania in 1803. A small group of 49 persons sent by the Australian Government to investigate the isolated islands potential⁶.

Already from the start, it became evident that this was not a land that was going to be easy to tame. Already inhabited by the aborigines the rugged and continuously changing landscape gave the settlers more than one challenge⁷.

The first general scientific description of the so called “Vandemonian Tyger” was written by the

2 <http://www.iucnredlist.org/apps/redlist/details/21866/0>

3 Robert Paddle

4 <http://www.dpiw.tas.gov.au/inter.nsf/WebPages/BHAN-53777B>

5 Robert Paddle

6 David Owen

7 Robert Paddle

settlements governor, Lieutenant Paterson who described an animal of destructive nature, living solitarily on “animal food”⁸

As the settlement of the Europeans grew so did the number of encounters between man and animal. The Thylacine’s habitat was rapidly shrinking as well did the amount of prey as settlers had started to hunt wallaby and emu in order to prevent starvation. Add to this the introduction of sheep and cattle to the island and disaster was already under way.

Thylacines **were** known to kill sheep but it is still debated whether they were the primary culprit or if that was the work of over exaggerated rumors⁹. Due to the hate against this “sheep-killer” very little is known about the thylacine. No one bothered with documenting the animal’s behavior in the wild. (The interest for the species awakened too late and then only captive animals could be studied properly.)

Hunting habits

What did the Thylacine prey on before the settlers arrived and maybe the most important question, how did they hunt??



<- Tasmanian Devil

Eastern Quoll -->



In an attempt to answer these questions M.E Jones and D.M Stoddart have used the Thylacines anatomical features and compared this data to existing marsupial carnivores and mammalian predators, this including the Tasmanian devil, different quoll species, the hyena and the wolf.

They measured the canine tooth strength as a calculation of “the ratio of the strength of the teeth,

⁸ David Owen

⁹ Amy Lynn Fletcher

on two axes, anterior-posterior and medio-lateral strength”¹⁰ in order to get some insight into method used to kill.

A Femur-Metatarsal ratio (FMT) was also calculated by measuring the longest point of the femur and the length of the third metatarsal, in placental mammals used to indicate running speed.

After analyzing and comparing the data it is suggested that the Thylacine used a puncturing, crushing bite while hunting prey small in comparison to its body weight.

When it comes to running speed no reliable implication could be made since FMT turned out to have no relationship to maximum running speed in marsupial mammals. It does have a broad predictive power in distinguishing the running **capacity** for species whose limbs have evolved firstly for cursorial movement¹¹. All that could be done was to compare the data to the Thylacine’s closest relatives (devil) and give an estimate. This estimate states that the Thylacine was **probably** a Pounce-Pursuit predator hunting in fairly open habitats.

Extinction

After having a bounty put on its head by the Tasmanian government in 1888, the Thylacine quickly declined in numbers becoming a more and more rare sight¹²

In 1930 the last thylacine was shot in the wild and presented to the government, and the last known specimen died in captivity in Hobart Zoo in 1936¹³. IUCN officially declared the thylacine as “possible extinct” in 1986 and has now changed its status to “extinct”¹⁴ but despite this the search for this iconic animal continues. Huge rewards (\$200 000) have been offered to anyone who could bring hard evidence of the animals existence forward¹⁵. And now a new wave of “believers” have begun to surface claiming sightings of the TT and arguing strongly for its survival after the bounty scheme

10 M.E Jones, D.M Stoddart

11 M.E Jones, D.M Stoddart

12 David Owen

13 Amy Lynn Fletcher

14 <http://www.iucnredlist.org/apps/redlist/details/21866/0>

stopped¹⁶

Was there a chance of survival for this species after the bounty scheme or were they all brutally hunted and killed??

A model presented by ¹⁷ gives us some insight into these questions.

By making an equation combining economical and biological aspects such as hunting effort, catchability coefficient, population growth and carrying capacity E.H Bulte et al. claims that it would have taken a lot more effort in order to hunt the species to extinction. Their model shows that after the bounty scheme stopped a population of no less than 632 animals would have survived. Even if a possible disease would have killed 50% of the species combined with the hunting, around 70 individuals still would have survived. So without the disease the species long-term existence was never threatened but a combination of a disease and bounty hunting would have put the species through a s k “bottle-neck” (aka endangering long-term survival) but even under those circumstances the short-term survival of the species was ensured.

The authors does point out that more reliable data would be needed in order to get a clearer view of the species population dynamics and recovery.

Why does this animal mean so much to us that we still pursue it 70 years after the last documented sighting? One reason behind the Thylacine’s powerful iconic status is because in 1936, 56 days before the last specimen died, the first major piece of Australian legalization to **protect** endangered species passed. The extinction of this species is also a perfect example of conservation failure and colonial hubris¹⁸ and something we definitely should learn from.

The Cloning Project

So, when this high profile project first was announced in 1999 by the Australian museum in Sydney it

15 Robert Paddle

16 <http://www.naturalworlds.org/tigerbook/>

17 E.H Bulte, R.D Horan, J.F Shogren

18 Amy Lynn Fletcher



gave birth to a hectic debate among the Australians. To use such a controversial method as ancient DNA¹⁹ to “resurrect” one of the most iconic predators of all time did not fall well in everyone’s eyes. The project did not only link past to present it also “linked the present to one disruptive scenario of the technological future”²⁰

The project’s aim can be summarized in three “simple” steps

1. Extract DNA from preserved Thylacine pup.²¹ →
2. Reconstruct the Thylacine Genome
3. Implant cloned embryo into surrogate species.

Though it seems quite straightforward the team had a long twisting road ahead of them with one of the biggest problem being the degenerated and contaminated DNA.

In May 2000 the team declared that they now had extracted enough DNA to continue to step 2. And the DNA was not only from the preserved pup but also from bone marrow, teeth and dried muscle from two other individuals, proving to the skeptics that this might actually be possible.

In May 2002, four sections of three thylacine genes had been multiplied using PCR.

In February 2005, unfortunately, the project was ended due to lack of proper facilities and the overall poor quality of the available DNA.

But the dream lived on among the scientist and as a side branch of this project a paper was

19 Ancient DNA means DNA collected from fossils, archeological finds, museum specimen etc.

20 Amy Lynn Fletcher

21 Picture: <http://australianmuseum.net.au/image/Thylacine-pup-specimen/>, Photographer: Stuart Humphreys Rights: ©Australian Museum

produced in 2008 proving that certain DNA functions had been resurrected in transgenic mice using DNA from a 100-year-old ethanol preserved thylacine.²²

This clearly shows that even though this particular project was ended it gave inspiration to other scientist to dare to try things that appear impossible but might result in giant leaps in human capacity, and by doing so created media hysteria creating discussions like “should humans use science to fix the past, shall we play God?” Since this technology overstepped the natural boundaries it provoked unease throughout the world²³.

Discussion

Reading these articles and searching for information on the internet, it early became very evident to me that the Thylacine is a subject of controversy. Once hated and seen as a pest it is today one of the most iconic extinct animals and can be seen on all kind of market goods in Tasmania and Australia. As David Owen writes in his book

“Too late, Tasmanians realized that their champion marsupial carnivore occupied a vulnerable niche in the island’s ecosystem. Thylacines were neither pest nor vermin but simply a perceived obstacle to nineteenth-century process...”

You say one learn from their mistakes, well it’s not for nothing that 30% of Tasmania’s land surface is locked away as World heritage area and protected parkland.

When looking at all this different information concerning the Thylacines behavior you have to take into consideration that many of the observation were made at the beginning on the 20th century when the species was under considerable stress and the classification of the Thylacine as a “solitary animals” might not be correct at all. One can compare it to other marsupial predators but its real behavior will always be shrouded in mystery.

Concerning the discussions about whether it is still alive or not. Since there is not enough information on its population dynamics before the hunting started, any scientific paper based on this data need to be read with caution.

I myself think that if there now have been that many sightings after 1936 then there should have been clear photographic evidence or a body by now. That is not too much asked is it?!

22 <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2375112/>

23 Amy Lynn Fletcher

Cloning itself is a very controversial subject itself, but the fact that the Australian Museum was the first in the world to declare that they wanted to resurrect the Tasmanian tiger, makes you think back on the past and why it was extinct in the first place.

Is this another step towards trying to tame mother nature, and should this boundary really be crossed? Extinction is a powerful way of saying "*you are not good enough to be able to survive in the future*" who are we to question and decide that?

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