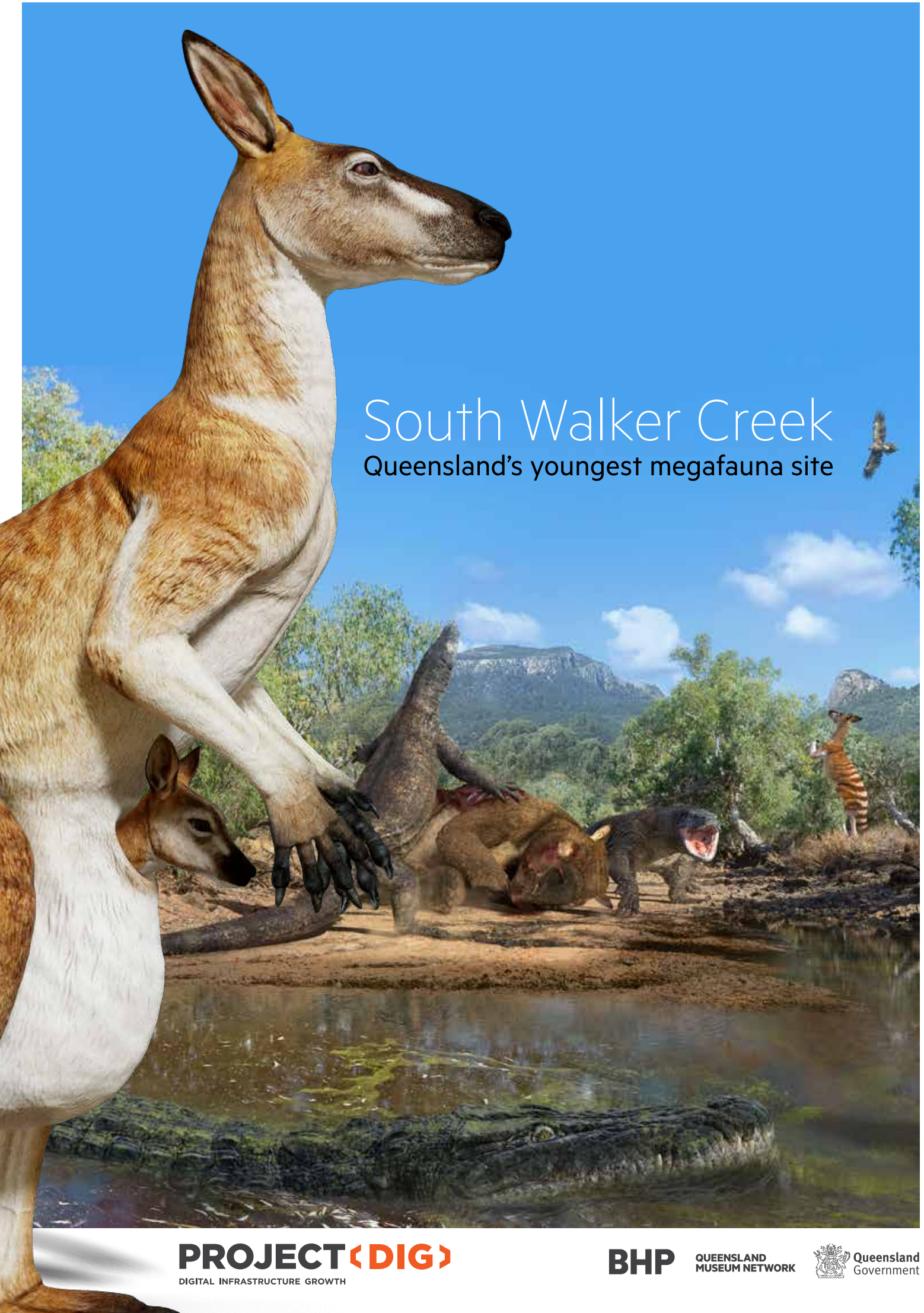


PROJECT DIG
DIGITAL INFRASTRUCTURE GROWTH

BHP

QUEENSLAND MUSEUM NETWORK

Queensland Government

A chance discovery revealed an important story.

In 2008 local Traditional Owners, the Barada Barna people, were conducting a Cultural Heritage Survey of BHP's South Walker Creek mine site when they discovered a fossilised bone. Queensland Museum Network Palaeontologist Scott Hocknull was asked to identify the discovery. Dr Hocknull determined the bone was from the enormous crocodile *Pallimnarchus*, an extinct species of megafauna. Recognising the significance of this discovery, BHP invited Queensland Museum Network to investigate.

This small fragment of a bone would lead to more than a decade of work at the site and formed the basis of a new scientific paper "*Extinction of eastern Sahul megafauna coincides with sustained environmental deterioration*", published open access in *Nature Communications*.

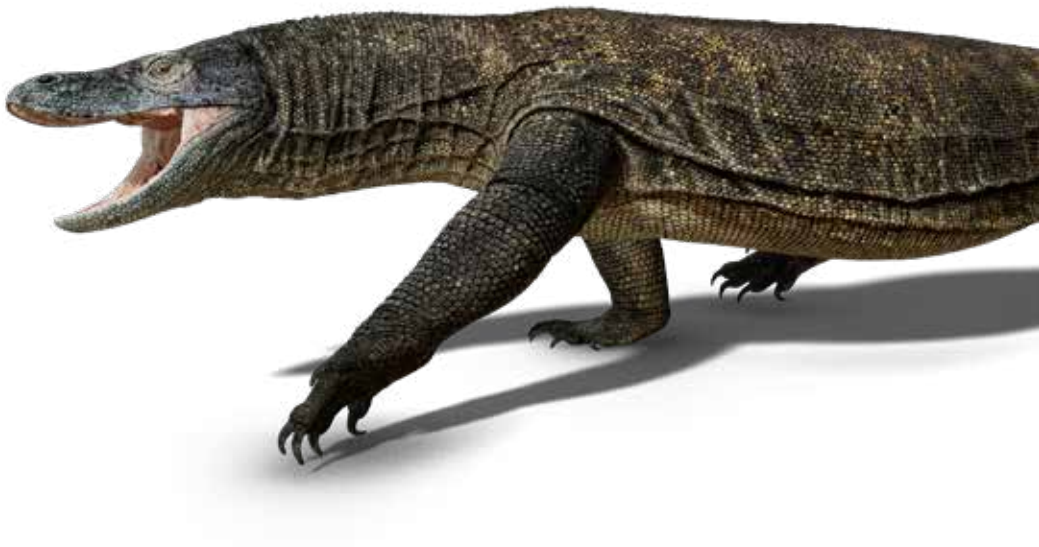
South Walker Creek is one of the youngest and most diverse megafauna sites in Australia and was home to 16 species of megafauna, including an incredible diverse number of reptile species, which is unique to Australia. Including the world's largest kangaroo which reached a height of 2.5 metres and weighed as much as 274 kilograms.

The site holds more than just fossilised bones of megafauna. Preserved seeds and leaves from plants, freshwater molluscs, insects and even pollen have been discovered, which will allow scientists to build a detailed picture of what the environment looked like 40,000 years ago.

This research paper provides the first confirmed evidence of megafauna living at a time when people had occupied northern Australia for as long as 25,000 years. However no archaeological evidence has so far been found within the fossil deposits at South Walker Creek. Queensland Museum is now working with Traditional Owners to try and find archaeological history.

South Walker Creek has formed the baseline for Project DIG, a partnership between Queensland Museum Network and BHP that allows the museum to digitise and visualise its scientific research collected there using cutting-edge 3D interactive technologies to unlock the collection for researchers and visitors worldwide.

As part of Project DIG, 3D models and reconstructions of the megafauna from South Walker Creek are now available online with interactive elements for people to learn more about the megafauna that lived at South Walker Creek.



Background Infomation

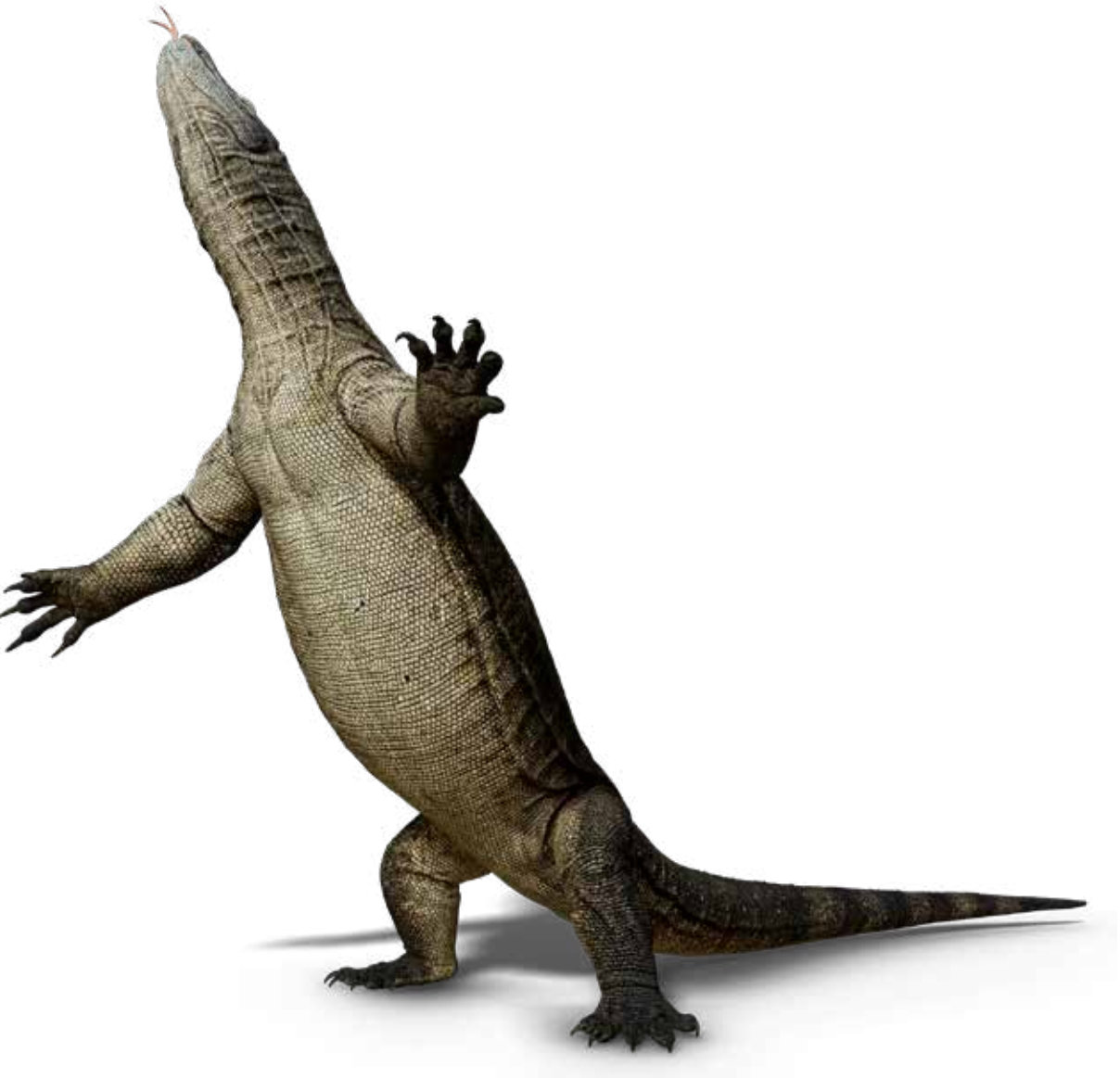
In 2018, Queensland Museum Network and BHP celebrated a decade of collaboration with a new $7.6M partnership called Project DIG (Digital Infrastructure Growth).

This creative alliance—the first of its kind anywhere in the world—is building Queensland Museum Network's capacity to deliver complex, long-term, data-intensive research programs.

With South Walker Creek as the baseline, Project DIG is revolutionising our scientific imaging and data management capabilities and promoting the global relevance of Earth Sciences through public programming, curriculum-linked resources and community events.

This unprecedented access to our globally significant scientific collections and research, will see students, scientists and innovators to curate their own virtual collection, make new discoveries and find solutions to complex global problems.

Find out more: www.projectdig.qm.qld.gov.au



South Walker Creek: Queensland's youngest megafauna site

ABOUT QUEENSLAND MUSEUM NETWORK

Queensland Museum Network (the Network) is the keeping place for the State Collection of more than 1.2 million objects and specimens, valued at more than $546 million, and approximately 14 million research collection items. For more than 150 years Queensland Museum has grown alongside Queensland to inspire, enrich and empower communities.

The Network has grown since the Queensland Museum was founded by the Queensland Philosophical Society in January 1862, coming under the responsibility of the State Government in 1871 and moving into its first purpose-built premises in 1879.

Today, the Network is governed by the Board of the Queensland Museum (the Board) and includes:

- Queensland Museum in the heart of Brisbane's Cultural Precinct at South Bank
- Cobb+Co Museum in Toowoomba
- Museum of Tropical Queensland in Townsville
- The Workshops Rail Museum in Ipswich
- Queensland Museum Collections, Research and Loans Centre at Hendra
- Museum of Lands, Mapping and Surveying
- Earth Sciences Museum, University of Queensland

Over the years the Network has changed alongside Queensland as it discovers, documents and celebrates the State's natural, cultural and regional diversity.

Through its dynamic network of public attractions, trusted scientific and cultural research, significant collections, and regional and community services, Queensland Museum Network continues to enrich the cultural, social and intellectual life of Queenslanders and visitors to the State.

The Network reaches far beyond the walls of its six public museums, fostering connections with diverse audiences of millions of people each year. It does this through museum visits, events, workshops, talks and lectures, school education kits, online interaction and publications, and continues to be at the forefront of successful professional and community support for the collections and museums sector.

Queensland Museum Network is celebrated as a valued cultural and scientific leader, growing with the community to foster a better understanding of our place in the world.

Its scientific and academic researchers are internationally recognised for their expertise in the disciplines of natural and cultural heritage and geosciences.

ABOUT BHP

BHP is a world-leading resources company determined to make a positive difference through their performance, shaping change for the better through innovation, productivity and technology.

Project DIG is a creative alliance centred on enabling and rewarding innovative thinking. It will provide new opportunities for researchers, educators, learners, entrepreneurs and innovators to work together to discover creative solutions to global challenges.

South Walker Creek: Queensland's youngest megafauna site

New paper unlocks mysteries of megafauna extinction

Queensland Museum palaeontologists have today announced the discovery of new extinct Australian megafauna that lived until 40,000 years ago in tropical northern Australia.

The research team, led by Queensland Museum and included experts from Australian universities, concluded in this new study that extreme environmental change was the most likely cause of their extinction, and that humans could not be blamed.

The findings published in the open access scientific journal, Nature Communications outlines how the successive loss of water flow, intensified drying, increased burning and vegetation change created the conditions to drive the extinction of at least 13 species of super-sized megafauna species, including four reptilian megapredators, a marsupial 'lion' and the world's largest wombats and kangaroos.

The paper is the culmination of more than a decade of work for Queensland Museum palaeontologist, Dr Scott Hocknull who worked with scientists from the University of Adelaide, Griffith University, Southern Cross University, University of Queensland, Australian National University and University of Wollongong.

Dr Hocknull said there is still more research to come out of an area near Mackay called South Walker Creek, which is the youngest megafauna site in northern Australia and was once home to at least 16 species of megafauna.

"*The megafauna at South Walker Creek were uniquely tropical, dominated by huge reptilian carnivores and mega-herbivores that went extinct around 40,000 years ago, well after humans arrived onto mainland Australia,*" Dr Hocknull said.

"*We cannot place humans at this 40,000-year-old crime scene, we have no firm evidence. Therefore, we find no role for humans in the extinction of these species of megafauna,*" Dr Hocknull said.

"*Instead, we do find that their extinction is coincident with major climatic and environmental deterioration both locally and regionally, including increased fire, reduction in grasslands and loss of freshwater. Together, these sustained changes were simply too much for the largest of Australia's animals to cope with.*

"*Not since the time of the dinosaurs has Australia been home to such magnificent giants, and yet within a geological instant they were gone forever. There is a message in that for everyone.*

"*This research has significant bearing on how we see our current landscape and the impacts of climate change, fire, vegetation change and availability of water on the survival of our existing modern megafauna – both native and domestic.*"

The South Walker Creek site was the stomping ground for a diverse range of megafauna including several new species, which are yet to be formally described.

Dr Hocknull said some of the highlights from the site included the discovery of the remains of the world's largest kangaroo at 2.5 metres tall and an estimated mass of 274kg, this makes it the largest kangaroo of all time.

"*While the rest of the world had giant carnivores like sabre-toothed cats, bears and hyenas, Australia's predators were mostly giant reptiles, including an extinct freshwater croc around 7-metres long, a relation to the modern salt water crocodile and a land-dwelling crocodile,"* Dr Hocknull said.

"*There were also two giant lizards including a 6-metre long lizard called Megalania and another giant lizard, similar in size to the Komodo Dragon.*"

Minister for Science and Minister for the Arts Leeanne Enoch said the research highlights the historical effects of climate change on not only our environment, but native species.

"*After more than a decade, Queensland Museum's research into megafauna and fossil collections continues to lead the way in uncovering more about our planet.*

"We can learn so much from our prehistoric past through valuable research such as the work performed by scientists, like Dr Hocknull," Ms Enoch said.

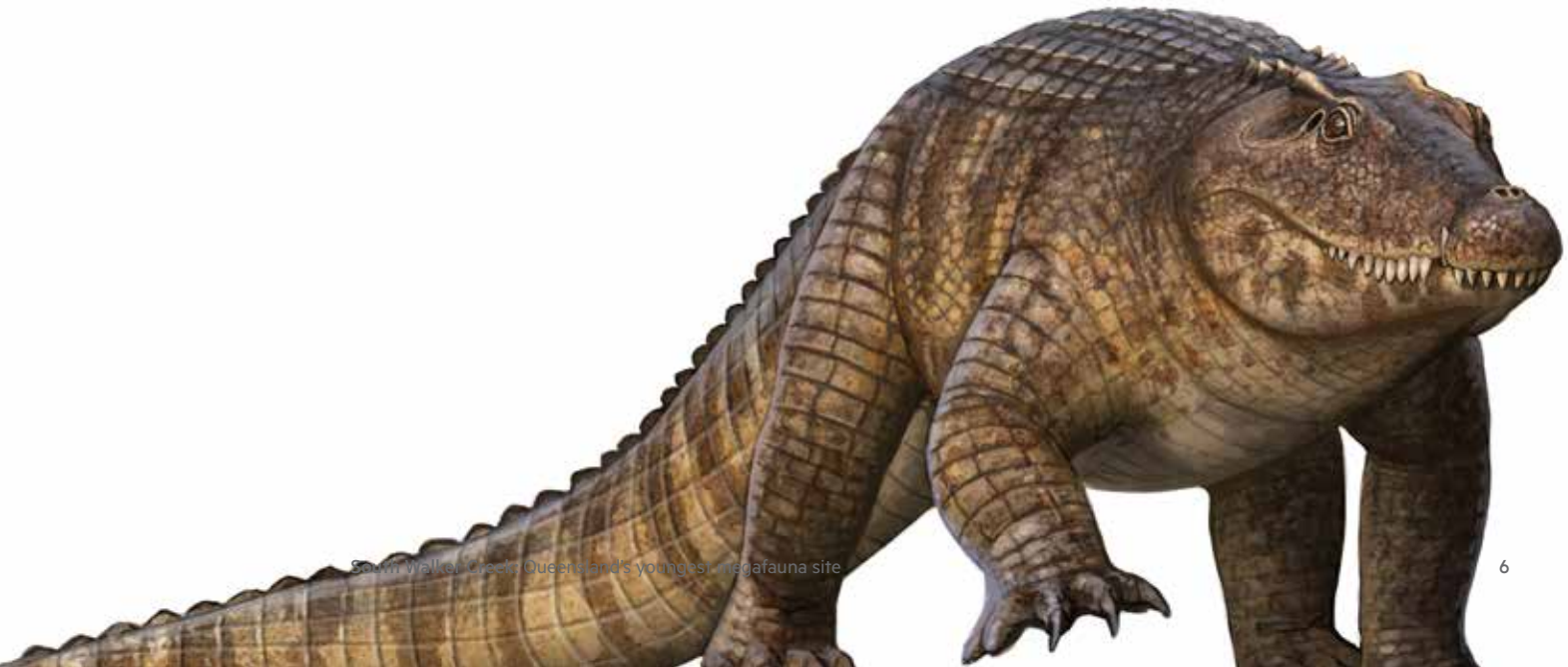
The fossils were discovered in 2008 by the Barada Barna people during a cultural heritage clearance at the South Walker Creek site which is operated by BHP Billiton Mitsui Coal (BMC). This site is located 40 kilometres west of Nebo and through a partnership with Queensland Museum Network, there has been a systematic excavation of the site since 2008 that has revealed spectacular never-before-seen megafauna fossils ranging from minute fish scales to colossal limb bones.

"*The Board of Directors from the Barada Barna Aboriginal Corporation are extremely excited that we have found the Megafauna within our traditional country,"* a Barada Barna Aboriginal Corporation spokesperson for the Board of Directors said.

"*We are also excited as to what the future holds with our ongoing relationship with Queensland Museum and BHP. The Barada Barna people have an immensely proud history dating back to our first encounters with Ludwig Leichhardt in 1845 on the banks of Cherwell Creek and having discovered Megafauna only enriches our history within this region.*

"*The team that discovered these finds back in 2008 had no idea of how great a discovery it was, with the help of Queensland Museum we have discovered more and more animals from that time.*"

South Walker Creek has formed the baseline for a project called Project DIG, a new partnership between Queensland Museum Network and BHP that allows the museum to digitise and visualise the information collected there using cutting-edge 3D interactive technologies to unlock collection for researchers and visitors.



South Walker Creek, Queensland's youngest megafauna site

Queensland Museum Network CEO, Dr Jim Thompson said Project DIG would help unlock Queensland's collection and reveal fascinating new insights into our ancient past.

"*South Walker Creek is one of the most unique and richly diverse megafauna sites in Australia; not only does it have bones, but seeds and leaves from plants, freshwater molluscs, insects and pollen, that will allow our palaeontologists to build a detailed picture of what the environment looked like 40,000 years ago,*" Dr Thompson said.

"*The fossils found at South Walker Creek will be among the first to be digitised by Project DIG, allowing us to share this collection and research with people across the globe.*"

Elsabe Muller, Asset President BHP Mitsui Coal said BHP was proud of our partnership with Queensland Museum Network which will build on the state's eResearch capabilities sharing significant research that will help the scientists of today and tomorrow unlock solutions to global problems.

"*BHP is proud of our partnership with Queensland Museum Network which means we can share these amazing discoveries from our backyard in Central Queensland with the world,*" Ms Muller said.

The Queensland Museum Network holds one of the largest and most significant fossil collections in the southern hemisphere. Scientists use the collection to record the history of life on the planet and understand how creatures from our ancient past adapted to geological events, particularly climate change. This research is invaluable in developing conservation strategies for Queensland's fragile ecosystems and threatened species.

Project DIG is a partnership between Queensland Museum and BHP to digitally unlock and share museum collections and research across the globe.

Dr Hocknull worked with scientists from the University of Melbourne, University of Adelaide, Griffith University, Southern Cross University, University of Queensland, Australian National University and University of Wollongong.

Media Enquiries: media@qm.qld.gov.au

Christine Robertson **0417 741 710** or
Kylie Hay **0434 565 852**

ABOUT PROJECT DIG

BHP and Queensland Museum have entered into a unique five-year partnership not seen before in Australia. It's a $7.6 million partnership that enables Queensland Museum to transform how it stores, explores and share its globally significant research and information with students and scientists no matter where they are in the world.

Through Project DIG, Queensland Museum and BHP are working together to give the world access to the Museum's invaluable data – access that will see new discoveries and unimaginable collaborations of scientific significance, benefiting innovators, researchers and students and helping to solve complex problems of internationally relevance.

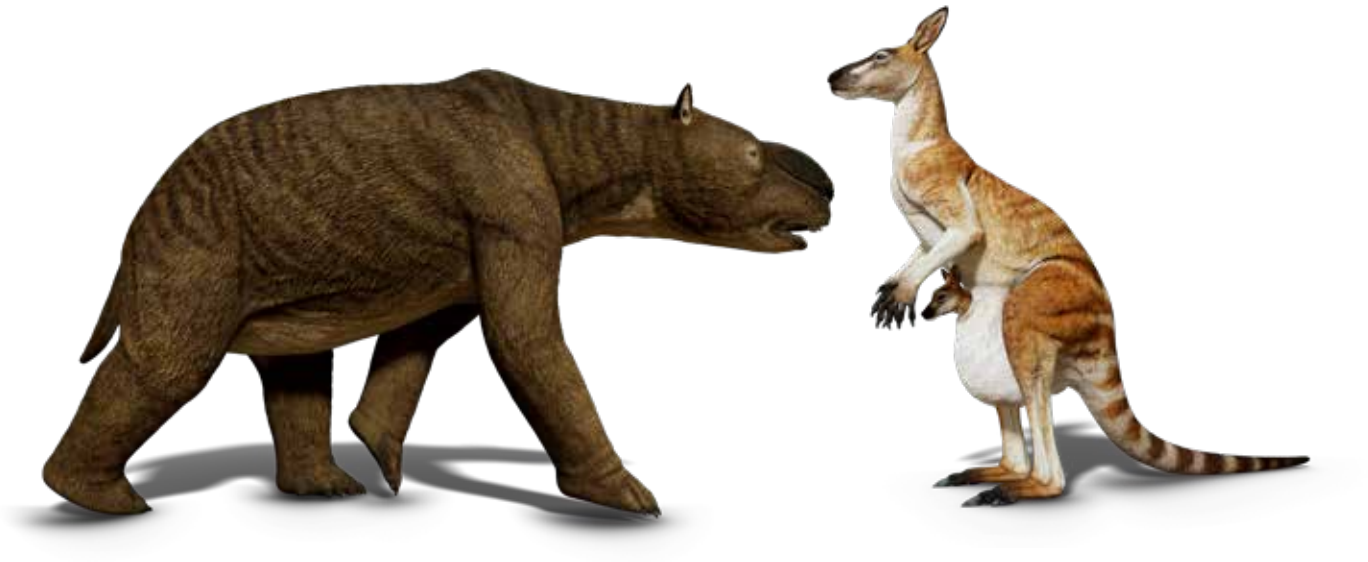
ABOUT QUEENSLAND MUSEUM NETWORK

Queensland Museum is part of the Queensland Museum Network and the keeping place for the State Collection of 1.2 million objects and specimens, valued at more than $546 million, and approximately 14 million research collection items. For more than 150 years Queensland Museum has grown alongside Queensland to inspire, enrich and empower communities.

South Walker Creek: Queensland's youngest megafauna site

South Walker Creek Megafauna

What was life like 40,000 years ago in tropical Australia? Take a look at some of the megafauna that called South Walker Creek their home.



Diprotodon optatum

Giant Marsupial

- World's Largest Marsupial.
- Lived 1 million – 40,000 years ago.
- Related to wombats and koalas.
- Walked on four feet.
- Had a pouch, probably backward facing.
- Two huge tusks in its lower jaw.
- Plant eater.
- Found across Australia.

Image: Reconstruction of the giant wombat-like marsupial, *Diprotodon optatum*. Credit, Vlad Konstantinov, Andrey Atuchin & Scott Hocknull © 2013 Queensland Museum.

Macropus sp. (giant)

Giant Kangaroo

- World's tallest kangaroo.
- Lived 60,000 – 40,000 years ago.
- Related to *Macropus pearsoni*, Pearson's Giant Kangaroo.
- Peculiar deer-like claws on its feet.
- Stood on tip toes to feed using hind legs.
- Had a pouch.
- Plant eater, probably a browser.
- Found at South Walker Creek.

Image: Reconstruction of the giant kangaroo from South Walker Creek, *Macropus* sp. Credit, Vlad Konstantinov, Andrey Atuchin & Scott Hocknull © 2013 Queensland Museum.

Protemnodon

Giant Forest Wallabies

- Lived 4 million – 40,000 years ago.
- Related to modern wallabies, *Wallabia*, *Petrogale* and *Thylogale*.
- Hopped on hind feet.
- Had a pouch.
- Plant eater.
- Very large arms and robust body proportions.
- Found throughout Australia.

Image: Reconstruction of the giant forest wallaby, *Protemnodon* sp. Credit, Andrey Atuchin, Rochelle Lawrence & Scott Hocknull © 2020 Queensland Museum.

Phascolonus

Giant Wombat

- Lived 4 million – 40,000 years ago.
- 2-3 times the size of modern wombats.
- 100-250 kg
- Massive body, walked on all four feet.
- May have made enormous burrows.
- Grass eater.
- All species had continuously growing teeth.
- Found throughout Australia.

Image: Reconstruction of the giant wombat, *Phascolonus gigas*. Credit, Andrey Atuchin, Rochelle Lawrence & Scott Hocknull © 2020 Queensland Museum.

Thylacoleo

Marsupial Lions

- Lived 4 million – 40,000 years ago.
- Related to koalas and wombats.
- Large pointed incisors adapted to piercing flesh.
- Large cutting premolars adapted to cutting flesh and cracking bone.
- Meat eater. Both predator and scavenger.
- Controversially thought to be a frugivore, feeding on fruits!
- Found throughout Australia.
- Three species known:

Thylacoleo crassidentatus (4 – 3.5 million years ago)
Thylacoleo hilli (3 million – 280,000 years ago)
Thylacoleo carnifex (1 million – 40,000 years ago)

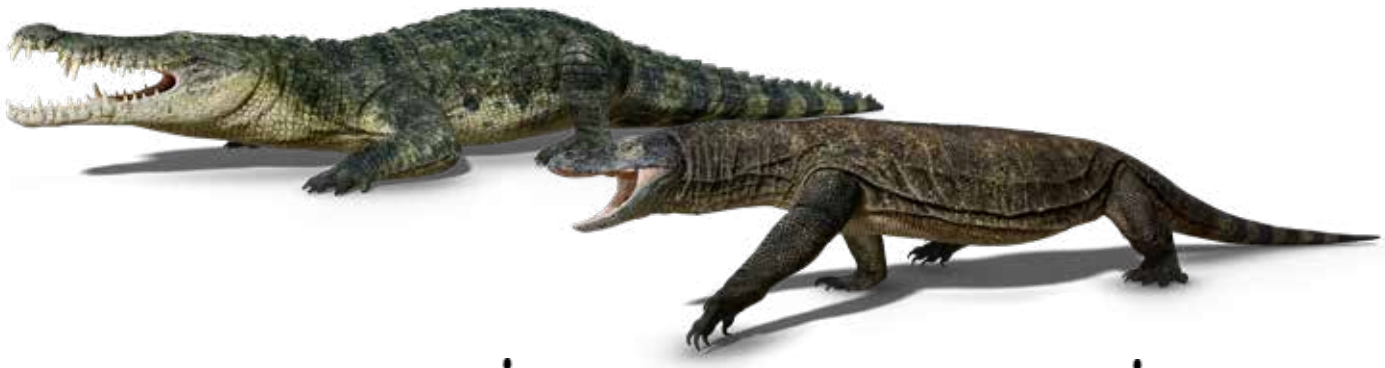
Image: Reconstruction of the marsupial lion, *Thylacoleo carnifex*. Credit, Andrey Atuchin, Rochelle Lawrence & Scott Hocknull © 2020 Queensland Museum.

Palorchestes

Marsupial 'Tapir'

- Lived 4 million – 40,000 years ago.
- Enormous snout with fleshy nose.
- Once thought to be a giant version of a tree kangaroo.
- Very small eyes for the size of its body.
- Plant eater, probably browser.
- Found throughout Australia.

Image: Reconstruction of the giant sloth-bear like marsupial, *Palorchestes*. Credit, Andrey Atuchin, Rochelle Lawrence & Scott Hocknull © 2020 Queensland Museum.



Pallimnarchus

Giant Freshwater Crocodile

- Lived between 4 million – 40,000 years ago.
- Thick skull with large conical teeth.
- Thick square armour plates (osteoderms).
- Large vertebrate hunter (e.g. megafauna) reaching 6 m in length.
- Part of the extinct crocodile group called mekosuchine crocodilians.
- Aquatic.
- Found across central, eastern and northern Australia.
- Inhabited Australia's inland rivers and lakes during the Pliocene and Pleistocene.
- Currently two species known.

Image: Reconstruction of the giant freshwater crocodile, *Pallimnarchus*. Credit, Vlad Konstantinov, Andrey Atuchin & Scott Hocknull
© 2013 Queensland Museum.

Varanus priscus

Megalania

- Lived 500,000 – 40,000 years ago.
- World's largest land-dwelling lizard.
- Gigantic monitor lizard growing up to 6 m in length.
- Teeth, jaws and skull adapted for gripping and ripping flesh.
- Meat eater, both predator and scavenger.
- Possibly venomous saliva which acted as an anticoagulant.
- Fossils of Megalania have been found throughout central and eastern Australia, as far south as Naracoorte Caves, South Australia.

Image: Reconstruction of the giant goanna Megalania, *Varanus priscus*. Credit, Vlad Konstantinov, Andrey Atuchin & Scott Hocknull
© 2013 Queensland Museum.

Quinkana

Ziphodont crocodile.

- Lived 4 million – 40,000 years ago.
- Possibly a land-dwelling crocodile.
- Possibly grew up to 3-4 m in length.
- Teeth adapted for slicing flesh.
- Meat eater, probably an ambush predator.
- Fossils of *Quinkana* have been found in caves lending support to them being a land-dwelling crocodilian.

Image: Reconstruction of the land-dwelling crocodile, *Quinkana*. Credit, Andrey Atuchin, Rochelle Lawrence & Scott Hocknull © 2020 Queensland Museum.

Crocodylus porosus

Saltwater or Estuarine Crocodile

- Lived 3 million – present day.
- Grows up to 7 m in length.
- Teeth adapted for aquatic prey such as fish and turtles.
- Meat eater, an ambush predator.
- Small crested bony armour along its back (osteoderms).
- Fossils of *Crocodylus porosus* have been found alongside those of *Pallimnarchus*, the giant freshwater crocodile.
- Found throughout northern tropical coastal Australia.

Image: The Saltwater Crocodile, *Crocodylus porosus*. Credit, Scott Hocknull © 2000

Notamacropus sp. (giant)

Giant Wallaby

- 60,000 – 40,000 years ago.
- Grows up to 1.8 m height.
- Likely a new species.
- Large wallaby similar to *Notamacropus agilis siva*.
- Plant-eater, grazer.
- Found at South Walker Creek.

Osphranter rufus

Red Kangaroo

- 60,000 – 40,000 years ago.
- Grows up to 1.4 m tall.
- Largest extant (living) terrestrial megafauna species in Australia
- Plant-eater, grazer.
- Fossils are rare but have been found on the Darling Downs and South Walker Creek.

Image: Red Kangaroo *Osphranter rufus* Credit © Queensland Museum.

Sedophascolomys

Extinct Wombat

- Lived 3.5 million years – 40,000 years ago.
- Grows up to 1.5 m long.
- Approximately 100 kg in weight.
- Possessed straight pencil-like lower tusks (incisors)
- Plant-eater, grazer.
- Oldest records from Chinchilla (Pliocene), youngest records at South Walker Creek (40,000 years old).

Digital Assets

There are a range of images and videos available for media use, including fossils, digital reconstruction of megafauna, in the field and more.
























Media Contacts and Social Media

MEDIA ENQUIRIES

Queensland Museum
media@qm.qld.gov.au

Christine Robertson

(07) 3840 7789
0417 741 710

Kylie Hay

(07) 3842 9388
0434 565 852

Connect with Queensland Museum

facebook.com/qldmuseum
Twitter: @qldmuseum
Instagram: qldmuseum
#ProjectDIGQM
#qldmuseum
www.qm.qld.gov.au

Connect with Bhp

facebook.com/bhp: @bhpqldnsw
Twitter: @bhp
Instagram: @inside_bhp
www.bhp.com

South Walker Creek: Queensland's youngest megafauna site