We need to protect the fossil heritage on our doorstep
27 July 2015, by John Long

A prehistoric scene showing ancient penguins, elephant seals and giant marsupials. A rich diversity of both marine and land creatures once lived at Beaumaris, Melbourne, about 7 million years ago. Credit: Peter Trusler, Monash University

From about the age of eight onwards I regularly collected fossils from around the beach area on the Beaumaris foreshore of Melbourne's Port Philip Bay.

I still recall the day I sat down on the beach there and put my hand on something sharp. It was a five million year old tiger shark's tooth, still razor sharp and in mint condition.

The fossils from this site are remarkably diverse and abundant. The 2 km stretch of coast between Table Rock and Mentone Beach is home to Australia's single richest marine animal fossil site, spanning the last 5 million to 10 million years of Earth's history.

Today I'm a professional palaeontologist. Between 2004 and 2009 I worked as the Head of Sciences at Museum Victoria and during that time I become more aware of the research on Beaumaris fossils.

Dr Erich Fitzgerald, the senior curator in vertebrate palaeontology at Museum Victoria, and others study the vertebrate fossils that keep emerging from Beaumaris on a surprisingly regular basis. Every discovery tells us something special about ancient Melbourne and about Australia's changing past environments.

Plans for development

But this highly significant fossil site is under threat from a proposed development by the Beaumaris Motor Yacht Squadron, which wants to build an extensive marina on this area of public land.

Such a development could cover and restrict access to this fossil site, and be a major loss for the future study and development of Australia's unique natural heritage. A car park built in the late 1960s already covers up part of the site.

The plans were first submitted to the Victorian government several years ago with an Environmental Effects Statement requested back in 2009. Earlier this year I was one of 2,000 palaeontologists from more than 100 countries who wrote to the Victorian government to express our concerns over the plans.

The club has outlined what it thinks the impact and benefit of the proposed development will be to the area and the fossil sites. No final decision has been made, so the fate of the fossil site is still in limbo.

A national treasure trove of fossils

Fossils of an extraordinary array of marine life occur here in a concentration unmatched anywhere in Australia.

The fossils paint a vivid picture of life below a sea that once covered parts of Melbourne. They comprise remains of ancient whales, seals, dolphins, sharks, fishes and sea birds, crabs, shells, corals and sea urchins.
Fossilised shark teeth found at Beaumaris from gigantic extinct killer sharks, *Carcharodon hastalis* and *Carcharocles megalodon*. The latter was up to 15 metres in length and preyed on baleen whales. Credit: Erich Fitzgerald, Museum Victoria

An added distinction of Beaumaris is that it is one of the only sites known in Australia where we find evidence of our ancient land mammals in rocks formed in the shallows of an ancient bay.

As land animals died, their carcasses were washed out to sea by what was an ancestral Yarra River. This co-occurrence of land and marine animals is world famous, enabling precise dating of the evolution of Australia’s unique marsupial fauna.

Fossils from the site include well-preserved shark-teeth from at least 20 different species including whalers, tiger sharks, hammerheads and Port Jackson sharks. Teeth of extinct sharks include those from the largest predatory shark ever, the 15 metre *Carcharocles megalodon*.

Other finds include albatross bones and Australia’s only record of *Pelagornis*, a giant tooth-beaked seabird with a seven metre wingspan.

The site has also yielded dugongs, several kinds of whales, extinct large penguins, primitive dolphins, seals, and jaws of giant terrestrial marsupials.

Only last year, the discovery of sea turtle fossils at Beaumaris filled a 66-million-year-gap in the history of Australian reptiles. These and many other kinds of fossils can be found within the cliff sequences and within the layers of rock exposed during low-tide.

Fossils can also be found in the tilted reefs of sandstone exposed underwater in Beaumaris Bay.

**An internationally significant site**

Beaumaris is a site of international significance, attracting leading researchers from around the world, and contributing to our understanding of scientific questions of significance outside the Australian region.

The detailed studies of Beaumaris fossil penguin bones were seminal studies on the evolution of penguins as a group. These peer-reviewed papers were published by one of the 20th century’s most influential evolutionary biologists, George Gaylord Simpson, then a professor at Harvard University in the United States.

Simpson was a founding father of the now global Society of Vertebrate Paleontology, which has more than 2,300 members. He was compelled to write to the Secretary of the Victorian Branch of the Geological Society to express his personal concern about the Beaumaris fossil sites being threatened by development back in the 1960s.

In addition, I have consulted to the federal
government in assessing the scientific significance of several of Australia’s most important fossil sites over the past 20 years. In this capacity I would place Beaumaris as one of the most significant fossils sites in Victoria, and certainly in Australia’s top ten most significant fossil sites.

Beaumaris, as part of the Cheltenham area, even has a local geological time stage named for it, the Cheltenhamian.

Several leading science organisations have now written to the Victoria’s Environment Minister, Lisa Neville, to express their concern over the proposed marina at Beaumaris. These include the Society of Vertebrate Paleontology, the Paleontological Society, the Australian Association of Palaeontologists and the Royal Society of Victoria, collectively representing about 6,000 members worldwide.

Beaumaris as a future resource for all Australians

A giant toothed seabird, Pelagornis, once lived at Beaumaris, it had wingspan up to seven metres. It is the only known record of this group of birds from Australia. Credit: Peter Trusler, Monash University

Most fossil sites of high significance occur in fairly remote locations. It is very rare to have such an important fossil site within close distance of a major capital city.

This provides a unique and so far untapped tourism opportunity for Melbourne. On-site fossil museums in big cities are internationally as rare as hen's teeth.

Just imagine what could be done if one day funds were invested to properly develop the area around the Beaumaris fossil sites. International tourists could take a guided glass-bottomed boat tour and see giant fossil whale jaws in situ.

But the first, most important step, is to preserve this highly significant site, and for the Victorian government to officially recognise it for its unique values. It is indeed a rare a gift for all Australians to benefit from if it can be conserved for science, education and potential future tourism.

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