

Background to Declaration of the Gats River fossil bed:

The Gats River fossil bed in Nieu-Bethesda forms part of the palaeontological record of the Beaufort Formation of the Karoo. While most of the Karoo is known for its wealth and unbroken record of fossils this place is unique as it is not only one of the most productive fossil localities in the Beaufort Group but also preserves an internationally important record of life during the early diversification of land vertebrates. It provides a window into the occurrence and development of mammal-like-reptiles (therapsids), so called because they are reptiles which show features of mammals and represent a transitional stage between reptiles and mammals. This time period was crucial in the development of reptiles and higher forms of life as it was during this time that the reptilian lineage split and evolved into the various groups of reptiles which exist today. In the rocks of the Karoo are found fossils of the ancestors of lizards and snakes, tortoises, crocodiles, and dinosaurs.

The locality has long been known to be productive for fossils and has been collected by distinguished palaeontologists including Robert Broom, Croonie as well as James and Ben Kitching. In 1934, Dr Robert Broom wrote "the mammal-like reptiles from South Africa may be safely regarded as the most important fossil animals ever discovered, and their importance lies chiefly in the fact that there is little or no doubt that among them we have the ancestors of mammals, and the remote ancestors of man". The site is used as an educational experience for locals, the growing number of visitors to the town of Nieu-Bethesda and palaeosciences students alike as one is assured of finding fossils: this part of the river is shallow and mostly dry, allowing for good exposures of mudrocks of the Beaufort Group, which contain a relative abundance of fossil reptiles. The river is being flooded naturally once or twice a year, which results in constant exposure of new fossils.

A tourism and educational facility already exists, namely the Kitching Fossil Exploration Centre that is in walking distance and offers an exhibition of local fossils, informative videos, a prep lab and supervised fossil tours to the river bed. The site is also in close proximity to a major tourist attraction and the National Heritage Site the "Owl House", which was declared in 2017. The Kitching Fossil Exploration Centre and the Owl House offer combined tickets for both attractions.

Brief Statement of significance:

*The Gats River fossil site, in the riverbed at Nieu Bethesda, where rocks of the late Permian Dicynodont Assemblage Zone of the Karoo Supergroup are well exposed, has yielded numerous important fossils, and especially fossils of mammal-like reptiles (therapsids). Fossil taxa that have been collected from the site include *Youngina capensis*, *Dicynodon leoniceps*, *Oudenodon baini*, *Cynosaurus kitching*, *Ictidosuchops intermedius*, *Theriognathus*, and *Procynosuchus delaharpeae*.*

After every flood new fossils are exposed and this site already serves as an educational experience for locals as well as the growing number of visitors to the town as well as geology and palaeontology students that include this site in their fieldtrips due to its potential of easily finding new significant fossils and understanding palaeoenvironmental features.



The locality would be the first Karoo fossil locality to be declared a National Heritage Site despite the Karoo's renowned reputation of exceptional fossil diversity among the international community of palaeontologists.

SAHRA intends to declare the locality as a National Heritage Site.

