



## Mesozoic - Tertiary Fish/Amphibia (MZ-TR-FI-A)

### Block Description

Visit <https://jncc.gov.uk/gcr-site-list>, for more information on GCR blocks and sites  
For Palaeontology GCR block descriptions and GCR site lists,  
visit <https://jncc.gov.uk/gcr-blocks-palaeontology>

## Introduction

In contrast to the manner in which most invertebrate fossils are represented in the GCR, fossils of vertebrates, arthropods (except trilobites) and terrestrial plants do have their own dedicated GCR Blocks, because of the relative rarity of the fossil material. The GCR sites selected for the Mesozoic-Tertiary Fish/'Amphibia' GCR Block represent the British fossil record of fishes and stem Tetrapoda and Amphibia of the Mesozoic Era and Tertiary sub-Era (the first part of the Cainozoic Era), from about 250 million years ago (Ma) to 2 Ma. At the end of the Permian Period (= end of Palaeozoic Era, preceding the Mesozoic Era) a significant, global, mass extinction took place, enabling this 'unit' of the fossil record to have a distinct opening signature (the total demise of all the older groups of agnathans); the end of the Tertiary sub-Era marks the beginning of the 'Great Ice Age'.

## Palaeontological characteristics

The term 'fishes', unlike 'mammals' or 'birds' includes a range for aquatic vertebrates across several taxonomic classes. It refers to the living bony fishes (the teleosts) and cartilaginous sharks, rays and skates (the chondrichthyans), as well as a number of surviving representatives of older groups that were much more common in the past, such as the coelacanths, dipnoans (lungfishes), myxinooids (hagfishes) and petromyzontids (lampreys). The hagfishes and lampreys are jawless (agnathan) fishes. There are also two other groups of 'fish-like' aquatic chordates, which are not strictly 'fishes'. These are the living lancelets (cephalochordates) and the extinct conodonts, which are both important for understanding fish evolution and are considered within this GCR Block.

Following the appearance of fishes in Ordovician-Silurian times, when the group were entirely marine, non-marine environments are represented in British Devonian rocks. The Devonian Period had been unmistakably an 'Age of Fishes' with its proliferation of species in the marine realm and the entry into fresh waters on all continents. An end-Devonian mass-extinction event involved the total demise of all the older groups of agnathans. Only the myxinooids (hagfishes), lampreys and most of the gnathostomes survived. The disappearance of so many vertebrate types made way for the gnathostomes, in particular, to radiate and expand the group.

The end-Permian mass-extinction event led to a burst of evolution and diversification in the Cainozoic Era comparable to the Devonian radiation.

As well as displaying the evolution of fossil fishes during Mesozoic and Tertiary time, Britain continues to yield invaluable material that helps elucidate the evolution of tetrapods; the localities yielding important 'Amphibia' material are few in number, but are also globally rare.

## Palaeoenvironment and palaeogeography

The different depositional environments that developed in Britain during late Palaeozoic times are summarised on the following pages:

**See Aalenian - Bajocian (AAL-BAJ), Aalenian - Bajocian (AAL-BAJ) Aptian-Albian (APT-ALB), Bathonian (BAT), Berriasian, Valanginian, Hauterivian, Barremian (BER-BAR), Cenomanian, Turonian, Senonian, Maastrichtian (CEN-MAA), Callovian (CLV), Hettangian, Sinemurian and Pliensbachian (HET-PBN), Kimmeridgian (KIM), Oxfordian (OXF) Portlandian - Berriasian (PTL-BER).**

## GCR site selection

For the purposes of site evaluation and selection, the GCR sites can be grouped into three principal themes or 'networks':

- British Triassic fossil fishes

- British Jurassic fossil fishes
- British Cretaceous fossil fishes
- British Cainozoic fossil fishes
- British Mesozoic-Tertiary stem Tetrapoda and Amphibia

Within the overall rationale of the GCR, sites were assessed with the following weightings in mind:

- sites of international significance because they have yielded fossils that are the 'type' material.
- sites where the fossils are exceptionally well preserved, showing features not seen elsewhere
- best-available sites for major fish/early tetrapod–amphibia assemblages necessary to represent evolutionary succession
- sites with particular significance to science and history of palaeontology in the development of studies of early vertebrates
- sites enabling the interpretation of the environments in which the animals lived.