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# East Kirkton, Bathgate — geology and wildlife

## Location

[Full colour illustrated PDF download](#)

## Figures

(Front cover)

(Figure 1) Location map.

(Figure 2) Artist impression of Lizzie, fossil of Lizzie; Figure a. reconstruction of the skeleton *Balanerpeton* Figure b is based on a "fleshing" out of the skeleton; Figure c shows the fossil in black mudstone.

## How to get there

Travel west along the A89 towards the centre of Bathgate, turn right after Bathgate Academy into Kirkton Avenue. Turn right into Puir Wifes Brae, continue up the hill until reaching a playground on the left — the quarry is opposite. Alternatively, travel east out of Bathgate along the Drumcross Road - turn right after Petershill Wildlife Reserve. Go past Limefield Farm - the quarry is on the left.

Grid reference [NS 99039 69037]

## What is a LGS?

A LGS is a Local Geodiversity Site. It is a landscape, landform or rock feature identified by the local geoconservation group as having particular value for: education and tourism; academic research; the history of science; or its aesthetic appearance. With the permission of the landowner, LGS are identified to the local council.

Contact: [Lothian and Borders GeoConservation](#)

A committee of the Edinburgh Geological Society, a charity registered in Scotland No SC008011.

It is a member of the Scottish Geodiversity Forum and GeoConservation UK.

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## Geology

The East Kirkton Limestone in the upper part of the West Lothian Oil Shale formation is a thinly bedded freshwater limestone. It lies within a thick succession of lavas and volcanic ash. Black mudstones lying above the limestone were also found to contain fish remains. The rocks, originally laid down horizontally, are now tilted at 20 to 40 degrees to the west-south-west. They are between 9 m and 19 m thick.

East Kirkton is a scheduled Site of Special Scientific Interest (SSSI). It has also been designated a Local Geodiversity Site (LGS). Collecting is not allowed without the permission of Scottish Natural Heritage or West Lothian Council.

What are the planning implications? There are statutory restrictions on the site, when planning proposals are considered the council will be aware of the value of the SSSI. We need volunteers to promote and carry on our work.

## Geology and wildlife

East Kirkton is a small, disused lime quarry tucked away under trees on the outskirts of Bathgate. It was worked in the early part of the 19th century and some fossils were found then. It closed in 1884 and had been neglected by fossil hunters until the late Stan Wood, a professional collector, found fossils in a nearby field wall in 1984 and traced the rock to East Kirkton.

East Kirkton is an unusual deposit because it favours the fossilization of land animals rather than those that lived in water. Volcanic hot springs rich in dissolved chemicals fed a small lake, formed 338 million years ago. These chemicals were deposited as layers of sediment on the bottom of the lake, later changing to rock, preserving fossil animals and plants.

At East Kirkton, fossils of water-living animals are rare, probably because the lake was usually scalding hot or poisonous. However, the rock contains many fossils of land living animals and plants that ended up in the lake, or water-living animals which were at the very least amphibious, living on the land as well as in the water.

East Kirkton has been the scene of some of the most exciting discoveries in Scottish paleontology. The "star" is *Westlothiana*, previously thought to be the earliest known reptile, but now considered to be close to the ancestry of that group. Four-legged, as well as legless, snake-like amphibian skeletons were also found along with spiders, scorpions and millipedes. Tree sized seed ferns grew nearby.

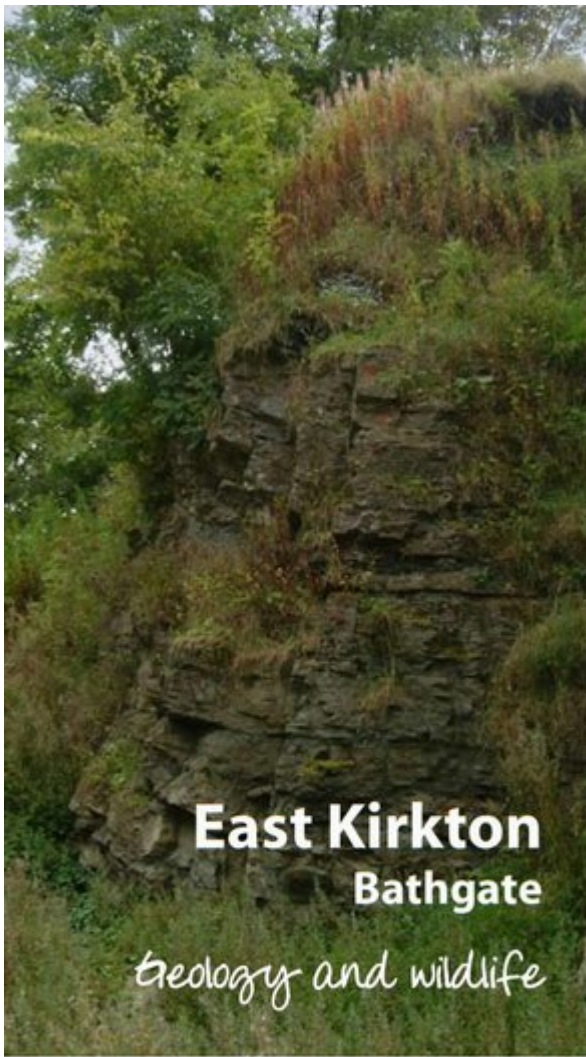
The fossil named *Westlothiana* became famous as Lizzie the lizard. It was originally thought possible it was the ancestor of all other reptiles, birds and mammals (including humans). However, Lizzie is not really a lizard and it is difficult to tell if it is a reptile. Reptiles lay shelled eggs on land. Amphibians such as newts lay eggs in water. It is impossible to tell just by looking at the fossil skeleton whether Lizzie laid shelled eggs. It is even impossible to tell if Lizzie was a "she".

This means that researchers have to reason indirectly by comparing *Westlothiana* with reptiles and amphibians. This has led to international scientific debate — some think Lizzie is indeed the oldest reptile whilst others think that it is an amphibian. Whatever the truth of the matter, Lizzie is vital to understanding how reptiles evolved from amphibians. An equally important find from East Kirkton is shown in figures a–c. *Balanerpeton woodi* is an amphibian that belongs to the group which eventually evolved into today's frogs, toads and newts.

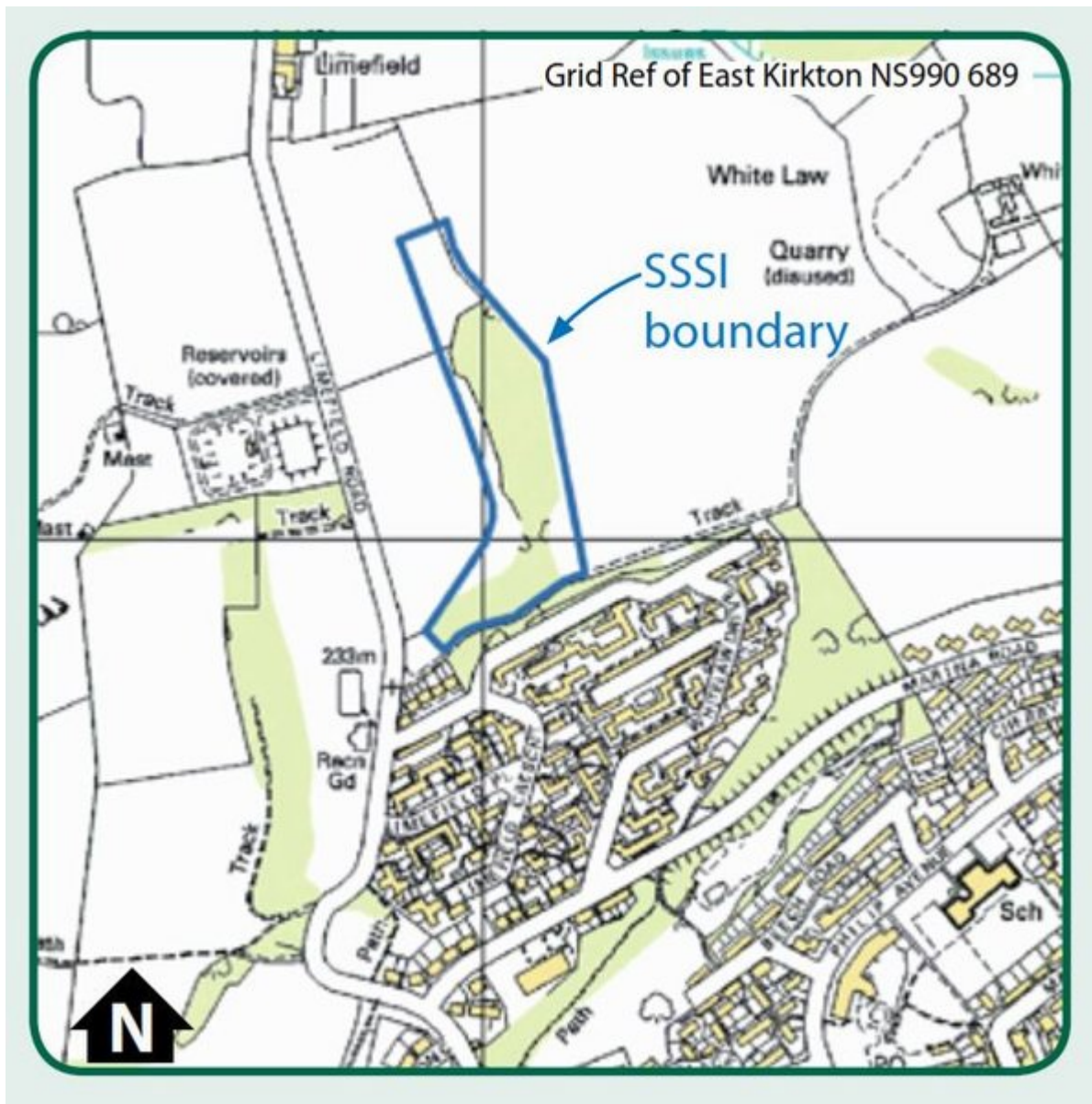
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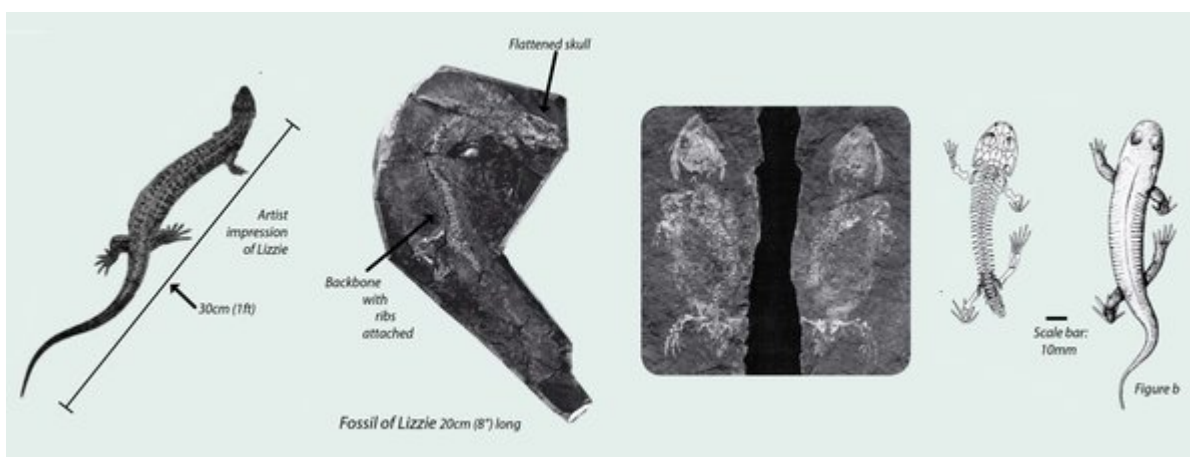
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Front cover



Location map.



Artist impression of Lizzie, fossil of Lizzie; Figure a. reconstruction of the skeleton Balanerpeton Figure b is based on a "fleshing" out of the skeleton; Figure c shows the fossil in black mudstone.