



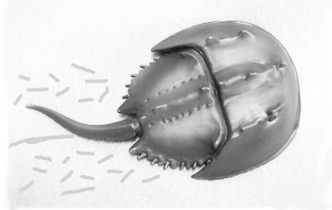
## Triassic Dinosaurs and Other Animals



Fossils are clues to the past, allowing researchers to reconstruct ancient environments. During the Late Triassic, the climate was very different from that of today. Located near the equator, this region was humid and tropical, the landscape dominated by a huge river system. Giant reptiles and amphibians, early dinosaurs, fish, and many invertebrates lived among the dense vegetation and in the winding waterways. New fossils come to light as paleontologists continue to study the Triassic treasure trove of Petrified Forest National Park.

### Invertebrates

Scattered throughout the sedimentary layers of the Chinle Formation are fossils of many types of invertebrates. Trace fossils including possible insect nests and beetle borings in the petrified logs. Thin slabs of shale have preserved more delicate animals such as shrimp, crayfish, and insects, including the wing of a cockroach!



#### Clams

Various freshwater bivalves have been found in the Chinle Formation, some species forming vast colonies in the muddy

beds of the ancient lakes and rivers. *Antediplodon thomasi* is one of the clam fossils found in the park.

#### Horseshoe crabs

Horseshoe crabs have been identified by their fossilized tracks (*Kouphichnium arizonae*), originally left in the soft sediments at the bottom of fresh water lakes and streams. These invertebrates probably ate worms, soft mollusks, plants, and dead fish.

### Freshwater Fish

The freshwater streams and rivers of the Triassic landscape were home to numerous species of fish, especially sharks and lungfish. Bony fish of the Late Triassic included *Turseodus* sp., *Semionotus* sp., and *Hemicalypterus weii*.

#### Freshwater Sharks

*Lissodus humblei* was a blunt-toothed shark about 6-9 inches (15-23 cm) long. The blunt teeth indicate it survived on clams and clam shrimp; it was probably a bottom dweller. "*Xenacanthus*" *moorei* was a 3 foot (1 m) long prong-toothed shark that fed on smaller fish, aquatic reptiles, and amphibians.

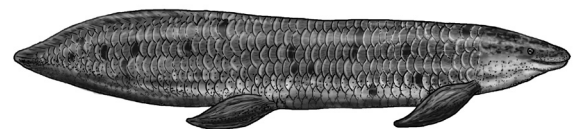
#### Coelacanth

Living species of coelacanths (seal-a-kanths) are still found in the world today.

The fossil species found in Petrified Forest National Park is *Chinlea sorenseni*. This large lobe-finned fish could reach up to 5 feet (1.5 m) long and weigh up to 150 pounds (68 kg). Its jaws were equipped with large, sharp teeth for catching and holding prey.

#### Lungfish

*Arganodus dorotheae* (pictured) were heavy fish up to 3 feet (1 m) in length and weighing up to 70 pounds (32 kg). They had fascinating, comb-shaped teeth used as crushing plates for clams. Some lungfish living today are able to leave the water for periods of time and breathe air.



### Amphibians

Metoposaurs (meh-toe-poe-sores) were giant amphibians. A common fossil animals found in the lower portion of the park is the large flat-headed amphibian *Koskinonodon perfectus* (pictured), 10 feet (3 m) long and weighing up to half a ton. These animals were most likely voracious predators feeding on fish and smaller



animals. With their flat heads and upward directed eyes, *Koskinonodon* probably settled in the muddy bottom of ponds and ambushed prey from below. *Koskinonodon* rarely occurs in the northern section of the park, which contains sediments younger than the Blue Mesa and Rainbow Forest. Giant amphibians are represented in these layers by a smaller yet similar animal named *Apachesaurus gregorii*.

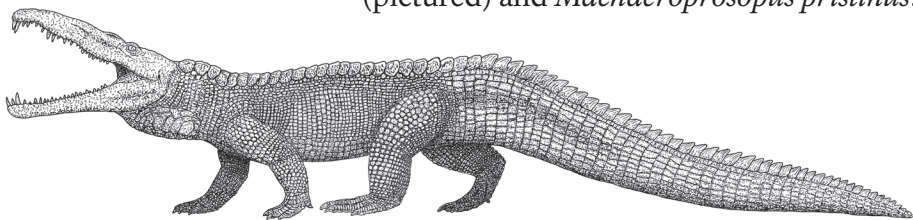
## Archosaurs

### Archosauriformes

Archosauriformes are a specialized group of reptiles that includes birds and crocodiles. In the Triassic, archosauriformes were represented by aetosaurs, phytosaurs, rauisuchians, and dinosaurs.

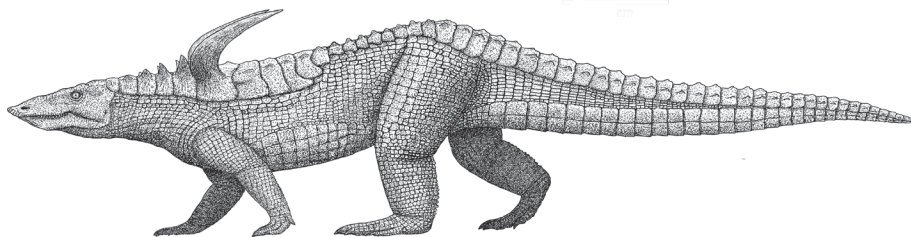
### Phytosaurs

Phytosaurs (fie-toe-sores) were crocodile-like reptiles, some species reaching lengths possibly exceeding 20 feet (6.1 meters). Distantly related, phytosaurs probably filled similar ecological niches as crocodiles, feeding mainly on fish and any other animals that came too near. Phytosaurs are the most common fossil animal found in the park, species including *Smilosuchus gregorii* (pictured) and *Machaeropsopus pristinus*.



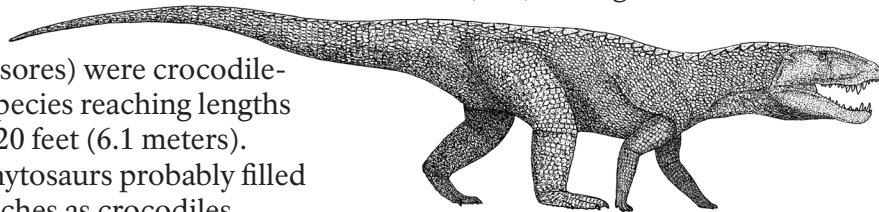
### Aetosaurs

Aetosaurs (a-ee-toe-sores) were 3-18 feet (1-6 m) long, herbivorous reptiles with broad flat bodies protected by plate-like scutes. Some species had large spikes on their sides or back that were possibly used for defense. Aetosaurs had short limbs and small skulls with a pig-like snout for rooting in soil for plants and roots. *Desmatosuchus spurensis* (pictured) and *Calyptosuchus wellsi* are two of the aetosaurs found in Petrified Forest National Park.



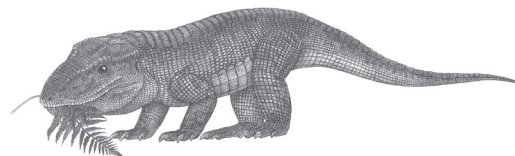
### Rauisuchians

Rauisuchians (rau-i-su-key-ans) ranked as the top terrestrial predators of the Late Triassic, thanks to huge skulls armed with powerful biting jaws and 3 inch (7.6 cm) long serrated teeth. Species of rauisuchians found in the park include *Postosuchus kirkpatricki* (pictured) and *Poposaurus gracilis*. Some rauisuchians could grow up to 20 feet (6 m) in length.



### Revueltosaurus

*Revueltosaurus callenderi* is a small, about 3 feet (1 m) long herbivorous reptile that until recently was quite an enigma. Known only from distinctive leaf-shaped teeth it was thought to be a primitive plant eating dinosaur. Discovery of the skeleton of this animal in Petrified Forest in 2004 showed that it was not a dinosaur and instead more closely related to aetosaurs and rauisuchians.



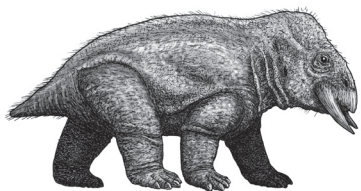
### Dinosaurs

Most visitors to the park are surprised to learn that dinosaurs are a relatively rare and minor component of the Triassic fauna preserved at the park. Separated from the other archosaurs by characters of the pelvis and ankle, Late Triassic dinosaurs were mainly small, bipedal carnivorous predators including *Chindesaurus* (pictured) and *Coelophysis*. *Coelophysis* (seal-o-fie-sis) was an early carnivorous dinosaur that probably walked on two legs. It was about 8 feet (2.4 m) long and could weigh 50 pounds (23 kg).



## Therapsids

Therapsids were large reptiles that possessed many mammalian characters including a “cheek” bone, enlarged canine teeth, pelvis, and a specialized attachment of the skull to the spine. *Placerias hesternus* (pla-seer-ee-us) was a dicynodont therapsid. This massive plant-eater was up to 9 feet (2.7 m) long and might have weighed as much as two tons. *Placerias* had



a short neck, barrel-shaped body, small tail, and a beak-like skull with large tusk-like bones protruding from its upper jaw. The beak-like jaws helped them pull up and tear tough plants and roots. While *Placerias* is represented in the park by isolated elements, it is common near St. Johns, just southeast of the park, where large numbers of *Placerias* were found in a single quarry.

Like pieces of a puzzle, fossils have long provided clues to the past. Paleontologists are reconstructing the Triassic ecosystem in Petrified Forest National Park by piecing together fossil records. The scientific and educational value of a fossil can only be interpreted when it is properly documented and studied. The displacement of a specimen from its surroundings reduces it to a mere curiosity. Help us by not disturbing any fossils you find during your visit. Report your fossil discoveries to any uniformed employee.