

SOURCE MATERIAL

The geological units shown on this map were taken from the Bedrock Geology of New Brunswick, New Brunswick Department of Natural Resources, Plate NR-1 (2000 Edition). Photographic images were provided by the New Brunswick Museum, Saint John, New Brunswick; and by the Atlantic Geoscience Society.

RECOMMENDED CITATION:

Fyffe, L.R., Martin, G.L., Miller, R., Richard, D., and Doiron, R. 2005. Rocks All Around Us. New Brunswick Department of Natural Resources: Minerals, Policy and Planning Division, Plate 2005-23.



Brachiopods live in the ocean and are a type of shellfish. They can bury themselves in the sand. They also can use their long, thin "foot" to attach themselves to the sea floor. Brachiopods are sometimes called "lampshells" because they look like oil lamps that were used in ancient Rome. You can find modern-day brachiopods in the deep cold waters of the Bay of Fundy. During the Age of Trilobites (540 to 390 million years ago), 30,000 kinds of lampshells existed in oceans around the world. Then about 250 million years ago, a catastrophic extinction event destroyed many forms of life on Earth, including a large number of lampshells. The ancient lampshell *Leptaena* lived on the floor of warm shallow seas that covered northern New Brunswick about 410 million years ago. Hard ridges on *Leptaena's* shell protected it from being damaged by underwater sandstorms during rough weather.

Location: Dalhousie, Restigouche County, New Brunswick. Image: NBMG 9802.



Favosites is a type of fossilized coral. Coral is formed by thousands of tiny animals living together in honeycomb-shaped tubes. The tubes are made of a chemical called calcium carbonate, which closely resembles limestone. Ancient colonies of *Favosites* grew to become the size of a cabbage. They lived on the floor of warm shallow seas that covered northern New Brunswick about 410 million years ago during the Age of Trilobites.

Location: Dalhousie, Restigouche County, New Brunswick. Image: NBMG 1948.



Sawdonia is a primitive land plant. It lived along the seashore in northern New Brunswick about 390 million years ago during the Age of Fishes. It grew to be 50 cm high and had spines instead of leaves along its stem. The spines absorbed carbon dioxide from the air.

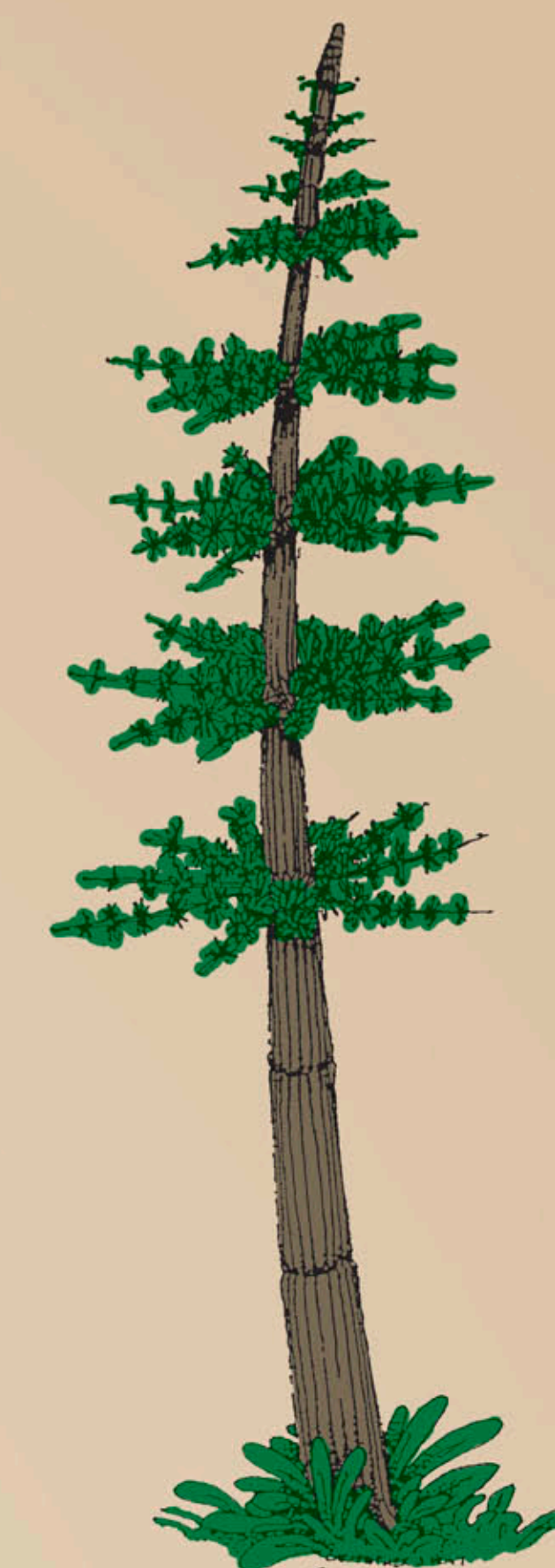
Location: Dalhousie, Restigouche County, New Brunswick. Image: NBMG 9092.



Calamites (shown to the right) is a tree like structure that reached up to 10 m high. It grew in hot, swampy forests that covered much of eastern New Brunswick about 310 million years ago during the Age of Ferns. Its needle-shaped leaves were arranged in circles around its branches (above). The modern horsetail rush is a close relative of *Calamites*. The tree fern *Medullosa* (shown below) also lived in the ancient swamps. It stood only 4 m high and had leaves (shown below to the right) that looked like modern-day ferns.

Calamites location: Clifton, Gloucester County, New Brunswick. Image: NBMG 9733.

Medullosa location: Minto, Queens County, New Brunswick. Image: NBMG 3637.



AGE OF DINOSAURS (100 to 250 Million Years Ago)

- Diabase Dyke
- Basalt
- Sandstone and Conglomerate

AGE OF FERNS (250 to 320 Million Years Ago)

- Sandstone, Conglomerate, and Coal

AGE OF FISHES (320 to 390 Million Years Ago)

- Granite
- Limestone, Gypsum, and Potash
- Conglomerate, Sandstone, and Shale
- Rhyolite
- Basalt

AGE OF TRILOBITES (390 to 540 Million Years Ago)

- Granite
- Gabbro (Black Granite)
- Limestone, Calcareous Sandstone, and Slate
- Sandstone, Slate, and Conglomerate
- Rhyolite
- Basalt

AGE OF PRIMITIVE LIFE (540 to 1000 Million Years Ago)

- Granite
- Gabbro (Black Granite)
- Marble
- Rhyolite
- Basalt

SOME MINES AND QUARRIES

1. Brunswick #12 - Zinc, Lead, Copper
2. Brunswick #16 - Zinc, Lead, Copper (past producer)
3. Caribou - Zinc, Lead, Copper (past producer)
4. Halfmile Lake - Zinc, Lead, Copper (past producer)
5. Heath Steele - Zinc, Lead, Copper (past producer)
6. Miramichi Brook - Zinc, Lead, Copper (past producer)
7. Restigouche - Zinc, Lead, Copper (past producer)
8. Lake George - Antimony (past producer)
9. Mount Pleasant - Tin, Tungsten (past producer)
10. Penobscot - Potash
11. McCully - Natural Gas
12. Minto - Coal
13. Havelock - Limestone
14. Brookville - Limestone, Dolomite
15. Sorensby - Limestone
16. Hillsborough - Gypsum
17. Plaster Rock - Gypsum
18. Cassidy Lake - Silica
19. Beaumont - Building Stone
20. St. George - Building Stone (past producer)
21. Springhill Road - Crushed Rock
22. Bayton - Crushed Rock
23. Bayside - Crushed Rock
24. Hampstead - Building Stone
25. Shediac - Building Stone (past producer)
26. Newcastle - Building Stone (past producer)



Graptolite fossils look like small saw-blades. Each blade represented a colony of animals. The individual animals lived in tiny, teeth-shaped structures that grew along the length of the blades. Some colonies floated in the sea (below). Others were attached to the sea floor and grew upright like little bushes. Graptolites first appeared about 540 million years ago and became extinct 300 million years ago. *Climacograptus* is a kind of graptolite (above). It lived in a deep ocean that covered much of New Brunswick about 460 million years ago during the Age of Trilobites.

Location: Belle Brook, York County, New Brunswick. Image: NBMG 5210.



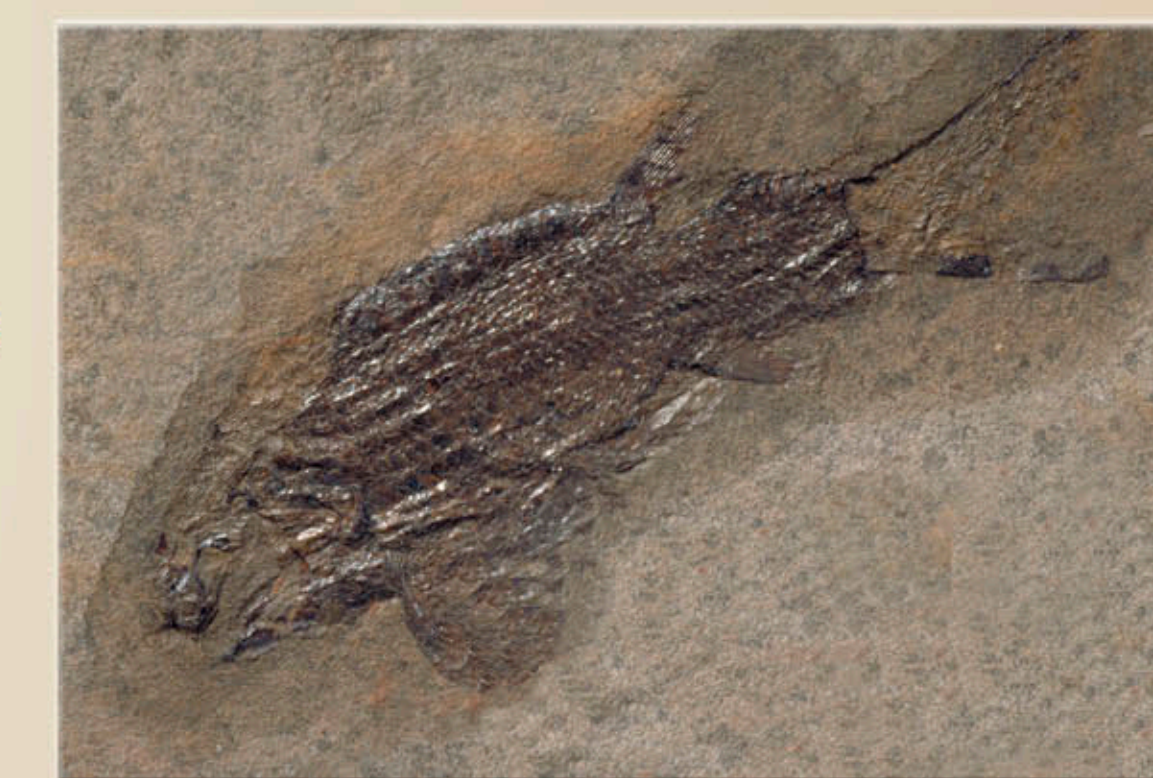
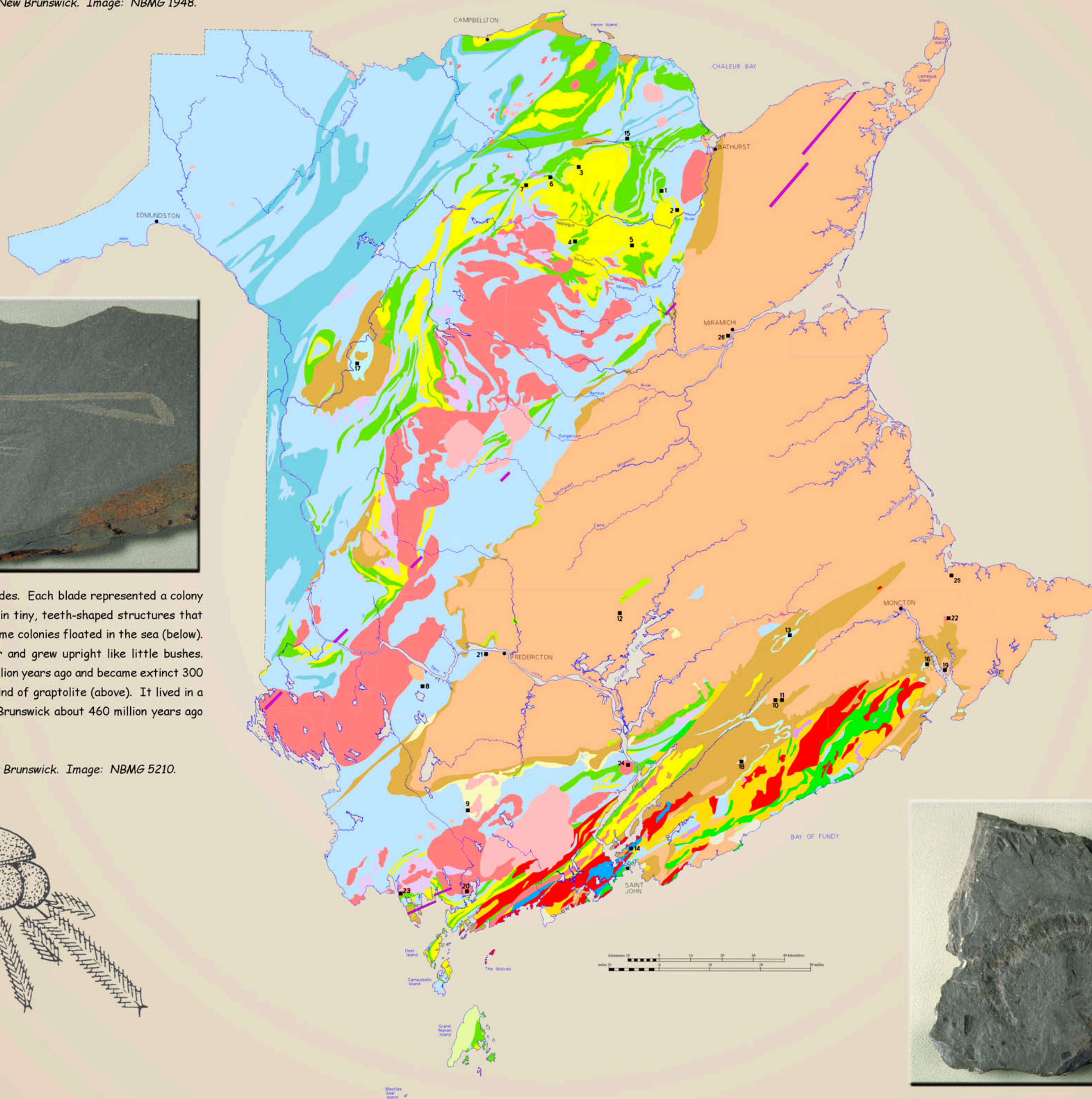
The Age of Trilobites lasted from 540 to 390 million years ago. During that time, about 15,000 kinds of trilobites lived in huge numbers in oceans around the world. Trilobites were hard-shelled animals and were some of the first creatures to develop eyes. Eyes helped them find their way around the ocean floor and to look for food. *Paradoxides* is 38 cm long and was one of the largest trilobite fossils in the world. It was discovered in Saint John by a young boy named William Matthew. He found it in 1885 with his famous geologist father, George Frederic Matthew. The last of the trilobites became extinct 250 million years ago during a catastrophic event that killed 90 percent of all life on earth.

Location: Saint John, Saint John County, New Brunswick. Image: NBMG 4004.



Archaeozyoon is an ancient type of stromatolite. Stromatolites live in shallow seawater. They are composed of many layers of lime sand and tiny bacteria. The bacteria use the sun's energy to change carbon dioxide and water into food in a process called photosynthesis. *Archaeozyoon* lived nearly one billion years ago in a warm shallow ocean, during the Age of Primitive Life, when the Earth's atmosphere held less oxygen than it does today. Photosynthesis by *Archaeozyoon* and other bacteria helped to increase oxygen levels in the atmosphere. Over time, this allowed more complex life forms to evolve.

Location: Saint John, Saint John County, New Brunswick. Image: NBMG 3200.



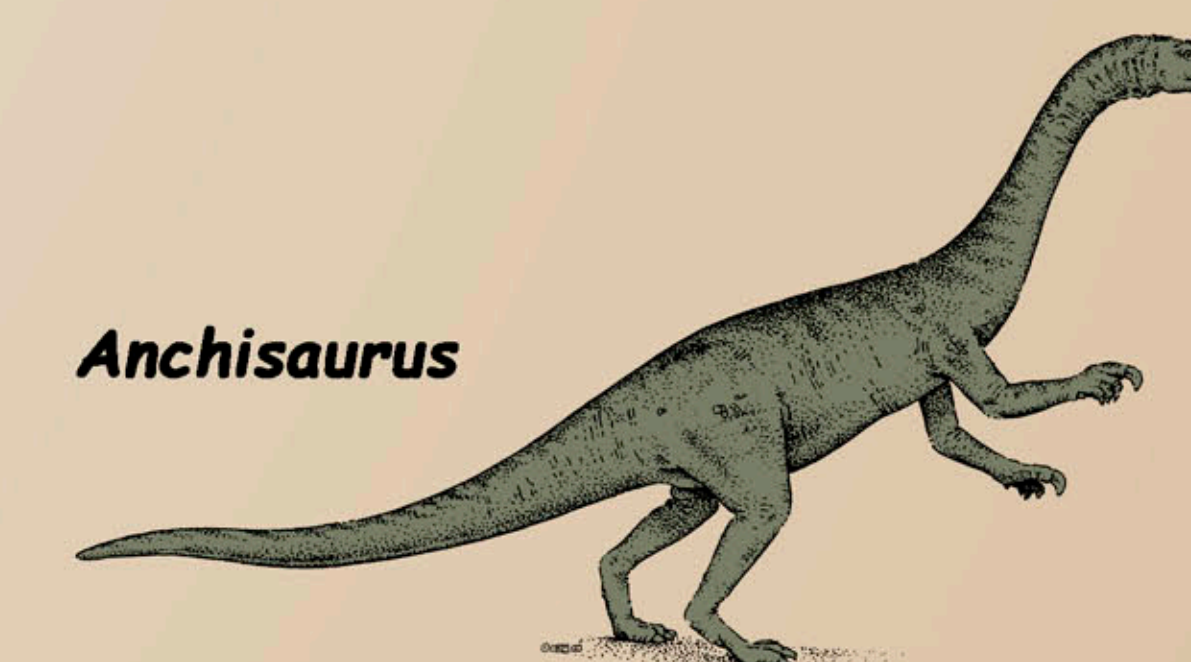
During the Age of Fishes about 350 million years ago, a large fresh-water lake covered much of southeastern New Brunswick. A small fish named *Rhadinichthys* lived in the lake. The fish was about 8 cm long and had diamond-shaped scales.

Location: Hillsborough, Albert County, New Brunswick. Image: NBMG 3100.

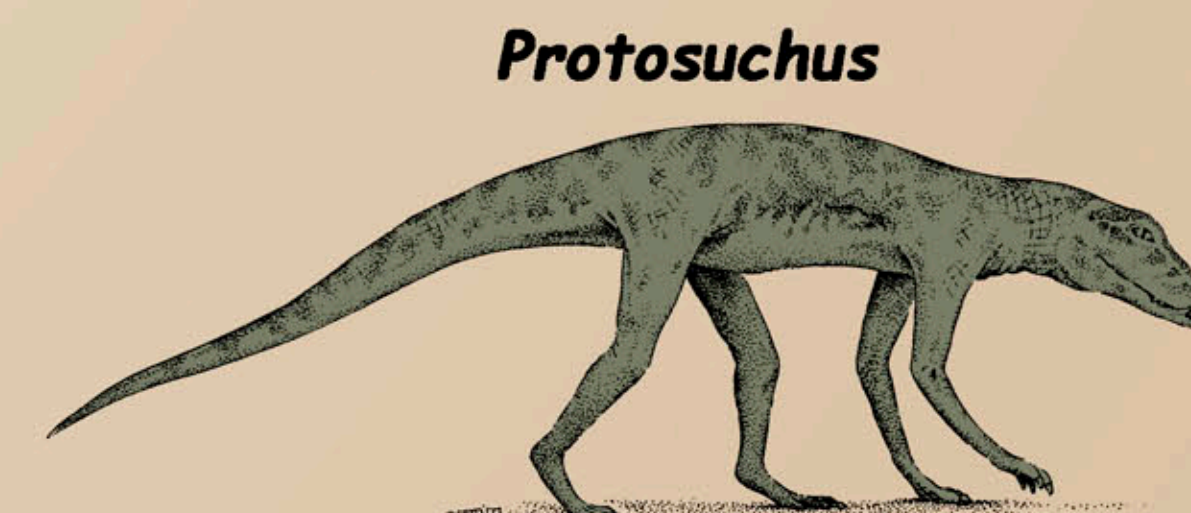


Euphoberia is likely a close relative of millipedes and lived in swampy forests that covered much of New Brunswick about 310 million years ago during the Age of Ferns. It grew to be 20 cm long. It had stink glands along its body to avoid being eaten by other animals looking for a tasty lunch. *Euphoberia* shared the swamp with giant dragonflies and also with another, much larger millipede-like animal that was 2 m long. You can see tracks of this huge bug in sandstone beds just east of Saint John.

Location: Saint John, Saint John County, New Brunswick. Image: NBMG 3022.



Anchisaurus



Protosuchus



The Bay of Fundy shoreline contains many beds of sandstone deposited about 200 million years ago during the Age of Dinosaurs. In places, the sandstone holds fossilized bones or footprints of dinosaurs and reptiles, including *Anchisaurus* and *Protosuchus*. *Anchisaurus* lived beside the Minas Basin in Nova Scotia. This plant-eating dinosaur walked on its hind legs and grew up to 5 m long. *Protosuchus* was a reptile that looked like a long-legged crocodile. It was about 50 cm long and had large teeth that were used to eat smaller creatures (left). Most true dinosaurs disappeared about 65 million years ago during a catastrophic extinction event. However, some feathered dinosaurs survived and evolved into modern-day birds.

Location: Parrsboro, Cumberland County, Nova Scotia. Images: AGS.