Tracking the top predator of the Pennsylvanian tropical biome: Implications for assumptions of the fossil record at Joggins

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One of the greatest misconceptions that became apparent in developing the case for World Heritage nomination of the Joggins Carboniferous section was that most everything was known about its paleontology and depositional environments. The example of the largest terrestrial predator of the Joggins ecosystem - and probably the tropical rainforest biome of the Pennsylvanian – is perhaps the most significant of these. First identified at Joggins (as usual in these matters) by Sir William Dawson as an unconvincing, solitary, footprint , the record grew dramatically a full century later in the 1990s when both Don Reid and Brian Hebert began to recognize the large, deeply impressed, and puzzling footprints that became nicknamed "Rex" in recognition of their unrivalled size – and unknown affinity. In the early 2000's, key osteological discoveries were made by Brian Hebert in what became known as the Hebert Sandstone: a mandible and pelvic girdle of a tetrapod large enough to make the footprints. The most likely candidates come from the stem tetrapod group Baphetidae. Footprints of the largest tetrapod have been discovered by us from a 1500 m stratigraphic interval comprising the Boss Point, Little River, and Joggins Formations of the Bashkirian. The scant record of skeletal remains throughout this section is remarkable given their recurring footprint record, but not inconsistent with the record of smaller tetrapods, which are rarely preserved external to fossilized lycopsid tree interiors. Fossil-bearing horizons occur in a wide range of depositional environments including well drained and poorly drained floodplains and under paleoclimates inferred to range from semi-arid through dry seasonal to humid seasonal. Apart from their assumed tie to water during times of reproduction, it would seem that the trackmakers were not circumscribed (endemic) to a narrow ecological habitat.

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