
**The taphonomic implications of a new
fossil tree from Joggins, Nova Scotia**

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The classic Carboniferous section at Joggins is most famous for the discovery of standing fossil trees that bear the skeletal remains of tetrapods (reptiles and amphibians), first discovered in 1852 by Lyell and Dawson. In more than a century since the intensive exploration by Dawson, primarily at Coal Mine Point where 15 productive trees were documented, only 5 other tetrapod-bearing trees have been discovered. We report here for the first time the discovery of a sixth productive tree (NSM006GF065.001) recovered in November 2006 with the aid of community members and Saint Mary's University geology students. Notably, 3 of these 6 trees have been discovered since 1995 from one horizon: 544 m above the base of the Joggins Formation, below Coal 20 (Forty Brine Seam), making this the second major tetrapod-bearing fossil forest horizon known at Joggins. As such, this horizon is of particular significance in understanding the nature of the entombment of the tree fauna. All three fossiliferous trees conform to the general model described by Dawson, with tetrapods occurring near the basal fill of trees that record evidence of wildfire. An in-depth analysis of the variation in fire damage and taphonomy of the entire tree horizon will be undertaken elsewhere. In this paper, we document the history of the new tree, with its exceptional

cross-sectional exposure showing the relationship between the skeletal record and its entombment and infilling.

Because of its location at the base of the cliffs, its prompt recovery, and its intact nature, the context of this tree has potential to be better understood than any other recently collected. The trunk flares downward from a diameter at breast height of 38 cm to a 45 cm base where the roots are preserved as flattened, coaly impressions in the surrounding dark grey siltstones. The base of this lycopsid tree is infilled by 24 cm of charcoal-rich sediment, the upper few centimetres of which contain robust tetrapod bones, possibly of an anthracosaur or labyrinthodont amphibian. Additional skeletal remains are expected to lie within this mineral charcoal layer. The tree remained hollow long enough for the woody stele to partially collapse within the once hollow tree, having lost the support of surrounding parenchymatous tissues. The burial of the trunk is recorded by almost a metre of grey siltstone overlain abruptly by rooted, laminated siltstone. The upper 60 cm of the trunk is encased by heterolithic, centroclinal cross-strata (vegetation induced sedimentary structure). Together, the tree, and its context, suggests a lycopsid growing in a low-lying interdistributary bayou, inhabited by tetrapods under a seasonal climate that fostered wildfire, and which was eventually buried by prograding distributary channels.