PALAIOS, 2007, v. 22, p. 457–464
Research Article
DOI: 10.2110/palo.2005.p05-121r

Significance of Atlantic Sturgeon Feeding Excavations, Mary's Point, Bay of Fundy, New Brunswick, Canada

Nadine J. Pearson,* Murray K. Gingras, Ian A. Armitage, and S. George Pemberton

Department of Earth and Atmospheric Sciences, University of Alberta, 1-26 Earth Science Building, Edmonton, Alberta, Canada, T6G 2E3
e-mail: nadinepearson@gmail.com

*Corresponding author. Current address: University of Saskatchewan, Department of Geological Sciences, 114 Science Place, Saskatoon, Saskatchewan, Canada, S7Z 5E2.
Keywords: *Piscichnus*, Atlantic sturgeon, biological erosion, neoichnology, marginal-marine

ABSTRACT

In this study we report on the occurrence and potential significance of Atlantic sturgeon (*Acipenser oxyrhynchus*) feeding traces observed in the Bay of Fundy in great abundance on the intertidal mud flats of Mary's Point, New Brunswick, Canada. The traces comprise a crescent-shaped impression and a plug-shaped excavation and are considered to be a modern analogue for the trace fossil *Piscichnus*. Local areas exhibit relatively great numbers of the feeding structure: the sediment in these zones contains bivalves (primarily *Macoma balthica*), worms (generally nereid polychaetes), and amphipods (*Corophium volutator*). Analysis of the feeding-trace distribution and orientation shows that activity is greatest within 500 m of mean high water and coincides with the highest population densities of amphipods (up to 30,000 individuals per m^2). Where sturgeon feeding is most intense, voluminous quantities of clay and silt are redistributed. Within the study area, as much as 1,220 m^3 of intertidal sediment is resuspended during the 6 summer weeks that mark peak sturgeon activity. The reworked sediment contributes to the extensive soupy substrate, which accumulates from suspension deposition of silts and minor amounts of clay during slack tide. Subsequent to their excavation, feeding depressions trap sediment. Thus, feeding by the Atlantic sturgeon locally represents an important erosional-depositional agent in the intertidal mud flat zone within Mary's Point.