Preliminary Report on the Neoichnology, Sedimentology, and Geomorphology of Pointbar and Levee Deposits of the Darling River on Bindara Station, Pooncarie, New South Wales, Australia

Hasiotis, Stephen T.[1]; Moffat, Ian [2]; Reilly, Mark [3] (1) Department of Geology, University of Kansas, Lawrence, KS. (2) Earth and Environment, The Australian National University, Canberra, ACT, Australia. (3) Whistler Research Pty Ltd, Noosaville DC, QLD, Australia.

Preliminary study on the neoichnology of channel-levee deposits of the Darling River on Bindara Station near Pooncarie, New South Wales, Australia, documents the association of sedimentary facies with biogenic and pedogenic features. The Darling River is the third largest river in Australia with headwaters in northern New South Wales fed by perennial and ephemeral rivers and streams flowing south from southern Queensland. Flow of the Darling River is highly irregular and has often been dry between 1885 and 1960. The climate in the study area has an average rainfall of 200-300 mm, average temperatures from 12-21 degrees C, with a ratio of potential evapotranspiration (1800-2200 mm) to actual evapotranspiration (300-400 mm) of 5-6. At the time of fieldwork the river was in very low flow with the water level just above thalweg, allowing access to cut trenches from the low water level up to and on the levee on both sides of the river. The cut bank geometry is highly irregular and forms a large broad terrace in the meander bend midway up the cut bank, as the river can not cut through a buried calcic vertisol. Trenches reveal that the entire pointbar is composed of mostly very thinly bedded channel-dipping climbing ripple bedforms with abundant organic debris. The levee comprises interlaminated to very thinly interbedded, ripples, climbing ripples, and parallel laminations, with rare silt and mud laminae. Horizontal burrows of mud loving beetles (Coleoptera: Heteroceridae) are constructed near the water's edge on the pointbar. Short (~10-40 cm; 0.5-1 cm diameter) and deep (40-150 cm; 1-2 cm diameter) vertical burrows produced by wolf spiders (Arachnida: Lycosoidae) and bardi grubs (Lepidotera: Hepialidae), respectively, dominate the subaerial pointbar, and are also present on the levee and the broad terrace in the cut bank. Mole crickets (Orthoptera: Gryllotalpidae) construct J- to Y-shaped burrows dominantly along the mid pointbar. No burrows were seen within the thalweg, however, shallow subhorizontal crayfish burrows were observed along the cut bank. Boxworks of galleries and chambers produced by ants and termites are also found on the cut bank terrace and the upper pointbar. Nests increased in size and depth away from the levee. We thank the landowners of Bindara Station for permission to camp and access to the Darling River.