**Supplementary materials: Appendix A**

*Archaeological evidence for a Bronze Age peat bog occupation*

Six piles were found vertically fixed in the UPA peat deposits of the Montodine section, forming a cluster emerging from the peat and truncated by the erosional surface E2 (Figs. 7B and 8E). They have a tapered base and a maximum diameter of 20 cm. A set of central rings from the major pile was selected to avoid wood decay and dated to 3205 ± 30 yrs 14C BP, i.e. 3369-3465 yrs cal BP. Given the felling age of this tree about 40 yrs old, the median probability for the absolute felling date is 3380 cal yrs BP (i.e. 1430 yrs cal BC, Middle Bronze Age). Other piles deeply infixed into UPA deposits may be related to the same human structures, although not showing clear faceting marks. Pile wedging structures are absent; nevertheless, deep casting of sediment lamination by pile penetration involved soft, water-rich plastic materials (Fig. 8). Cultural objects were not found associated with the residual deposit; unfortunately, substantial erosion occurred at top of the peat sequence, likely eliding the entire cultural record. The occupation phase, either inhabitation or boat landing structures, implied in any case a free water column still persisting in the oxbow basin during the Middle Bronze Age. The evidence presented here points to a yet unknown cultural site record. Several wetlands, related to groundwater fed streams, littoral and oxbow peat bogs are known to have been inhabited in the Bronze Age both along the upper Serio reach and the Dead Serio track (Baioni, 2009; Knobloch and Perani, 2011; Perego, 2017).

*The Late Medieval diversion of the Serio River and groundwater streams activity in the historical times*

The region under study was marked by a Late Holocene event of channel diversion of the Serio River whose triggering remains obscure. Here we summarize the current state of understanding of the geological setting and event timing.

During most of the Holocene time interval, the track of River Serio occupied a nowadays-relict valley, the so-called “Dead Serio” channel southeast of Crema (Figs. 2, 6, 7a, 8 and Supplementary Figure 1; Ravazzi et al., 2012). Following episodes of channel aggradation during the Bronze age and the late Roman age, the River Serio was subjected to a diversion between the 13th and 14th century (n. 6 in Fig. 5a), as suggested by archaeological evidence (Ravazzi et al., 2012) and by the documentary historical record (Ferrari, 1993). The track entrenched in the previous fluvioglacial fans, the “Dead Serio” with a marked NE-SW trend, was abandoned (see relict valleys and oxbow basins in Fig. 5a) in favour of a new N-S track following the Montodine trough, directly connecting the River Serio with River Adda (Supplementary Figure 1). The historical documentation indicates that the “Dead Serio” river was still active in the 10th-13th century AD (Falconi, 1979; Ferrari, 1993); furthermore, the river name *Serius novus* occurs first in a document dated to 1361 AD, and the first citation about an abandoned fluvial path “*flumen Serii mortui*” dates back to the end of 14th c. AD (Ferrari, 1993). Thus, the age of diversion may be restricted to the XIV century AD, in the Late Middle Ages. A map dated to 1051 AD reports an alternative, active river course nearby Montodine, coeval to the main course of the River Serio, which was still flowing in the “Dead Serio” path (Falconi, 1979). This alternative course can be identified with one of the several groundwater-fed streams emerging at the front of the valley scarp (Fig. 8) and feeding extensive marsh and swamps in the studied area (Ravazzi et al., 2012, 2020).

**Supplementary Figure 1** - View of the Adda River Valley and of the active and relict tracks of the Serio River (Digital Terrain Model). Location of the main morphologic, stratigraphic and structural features related to the last 40 ka and analysed in the present paper. A-B Montodine profile (Fig. 5C). We also show the location of the main morphologic and stratigraphic evidence of geodynamic events occurred in the last glacial cycle (numbers 1 to 6). 1: Montodine section and faulted belt (Figs. 9 and 10); 2: deformed pre-LGM peat belt supporting a fossil forest, outcropping in the Adda River bed at the SE of the town of Lodi (CNR, 2017); 3: Casaletto Ceredano reference section for MIS3 - LGM alluvial aggradation chronostratigraphy (Ravazzi et al., 2020); 4: deformed topography of the surface fan gradient at Pandino; 5: Pulignano meander, an example of lateral erosion by the Adda River on its postglacial valley right scarp during the most recent (Medieval) evolution of the postglacial valley; 6: diversion point – here the Serio River was captured by head-wall erosion thus forming the New Serio track. This Middle Age diversion leads to the abandonment of a track established in the lateglacial, becoming relict (Dead Serio River track).

**Supplementary Figure 2** - Geological map of the study area showing the main units discussed in the text; modified and simplified from Ravazzi et al. (2012).

**Supplementary Figure 3** -The top of the section with the unconformity E2 between the upper gravels of the River Serio (UMO) and the underlying UPA. (**A**) A fragment of Late Medieval Age pottery with *graffita padana* (XIV century) is shown in its original position along the unconformity E2. (**B**) Detail of the pottery with the typical *graffita padana*.

**REFERENCES (SUPPLEMENTARY MATERIAL)**

Baioni, M., 2009. *Museo Civico di Castelleone*. Edizioni Biblioteca-Museo, Castelleone, 89 pp.

CNR, 2017. *Il paesaggio di Lodi prima dell’Ultimo Massimo Glaciale. Polline e legni fossili da sedimenti sulla riva destra del fiume Adda*. CNR-IDPA, Milano 194 2017, Unpublished Technical Report.

Falconi, E., 1979. Le carte Cremonesi dei secoli VIII–XII. In: Falconi, E. (Ed.) *Documenti dei fondi Cremonesi (1073–1162), 1*. Cremona, Falconi (publisher).

Ferrari, V., 1993. L’evoluzione del basso corso del Serio in epoca storica e le interconnessioni territoriali derivate. *Insula Fulcheria XXII, Museo Civico di Crema e del Cremasco* 22, 9–42.

Knobloch, R., Perani G.P., 2011. Materiali dell’Età del Bronzo e del Ferro dal territorio di Pizzighettone e Maleo. Insula Fulcheria, XLI41, 146-–167.

Perego, R., 2017. Contribution to the development Development of the Bronze Age plant Plant economy in the surrounding of the Alps: an archaeobotanical case study of Early and Middle Bronze Age sites in northern Northern Italy (Lake Garda region). PhD Thesis, University of Basel, Basel, Switzerland.

Ravazzi C., Deaddis M., De Amicis M., Marchetti M., Vezzoli G., Zanchi A., 2012. The last 40 ka evolution of the Central Po Plain between the Adda and Serio rivers. *Geomorphologie* 18, 131–154.

Ravazzi, C., Pini, R., Badino, F., De Amicis, M., Londeix, L., Reimer, P.J., 2014. The latest LGM culmination of the Garda Glacier (Italian Alps) and the onset of glacial termination. Age of glacial collapse and vegetation chronosequence. *Quaternary. Science. Reviews.* 105, 26–47.

Ravazzi, C, Badino, F., Perego, R., Bertuletti, P., De Amicis, M., Deaddis, M., Garozzo, L., Novellino, M.D., Pini, R., 2020. Birch-sedge communities, forest withdrawal and flooding at the beginning of Heinrich Stadial 3 at the southern Alpine foreland. *Review of Palaeobotany and Palynology* 280, 104276.