THE SUBMERGED FOREST AT GOLDCLIFF EAST

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INTRODUCTION

Submerged forests in the Severn Estuary have been referred to in earlier studies (eg Reid 1913; Allen 1992). The upper and lower submerged forests at Goldcliff East are examples of the extensive exposures of prehistoric coastal woodland which are also visible, for example, at Redwick, Magor, Chapel Tump and Sudbrook. Remains of whole trees have been preserved in the Goldcliff intertidal peats. The lower submerged forest, associated with evidence of Mesolithic activity at Sites C and D (Bell *et al* 2003, this volume) is dated to 6770 ±70 BP (Beta-60761, 5740-5490 Cal BC). The upper submerged forest, which overlies Mesolithic occupation at Site J has been dated by Smith and Morgan (1989) 800 m to the east of Site J to between 5850 ±80 BP (Car-658; 4890-4570 Cal BC) and 5360 ±80 BP (Car 656; 4360-4000 Cal BC).

The area of most detailed survey during the 2002 fieldwork season is in the upper submerged forest and lies some 50 m south of the study site of Smith and Morgan (1989); for location see Bell *et al* (2003, fig. 1). By choosing an area near this site it was hoped that further ecological information could be gleaned, which would compliment that derived from the peats by Smith and Morgan (1989).

METHODOLOGY

Five areas (four 10 x 10 m and one 10 x 6 m) were examined on the upper peat shelf at Goldcliff East. This paper examines Area 4 (10 x 10 m) which was planned in the field and subsequently had wood samples identified at the post-excavation stage (Figure 1). The area was measured out and then surface water was removed using a mud scraper. The peat was then cleaned using trowels to carefully expose pieces of wood. Once exposed, these were recorded on a plan of the area and larger pieces sampled for wood identification analysis. Sample numbers and tree numbers were given to the wood and recorded on the plan. Wood analysis samples will provide evidence of the composition of trees in the submerged forest. Once recorded all wood sampled and trees were surveyed by EDM.

DISCUSSION

The Area 4 wood peat can be seen from Figure 1 to contain a substantial amount of wood, much of which is likely to have been fragments of branches and root systems. More prominent remains of the former woodland such as trunks (ie T245) and stumps (ie T234) can also be seen. Wood identification analysis (Figures 1 and 2, overleaf) shows woodland dominated by *Alnus* (alder), with *Betula* (birch), *Salix* (willow), and possibly *Populus* (poplar) also present. The presence of alder and willow suggests a damp carr woodland environment (Stace 1997). The plan of Area 4 suggests that parts of the carr woodland may have been fairly open, based on the distances between the more substantial trunk and stump woodland remnants.

It is likely this woodland can be correlated with pollen zone GC1-2 of the Smith and Morgan (1989) pollen diagram from Goldcliff East. In this zone there are large values of alder (up to 70% total land pollen), which would appear from Area 4 to have been the dominant tree taxon. Values for willow are not as high (up to 10% total land pollen), although this may be a product of variable pollen dispersal as willow is insect rather than wind pollinated. Dates for formation of this upper carr woodland were outlined in the introduction. Other woodland taxa such as *Quercus* (oak), *Corylus* (hazel), *Ulmus* (elm), *Tilia* (lime) and *Fraxinus* (ash) are also present in the Smith and

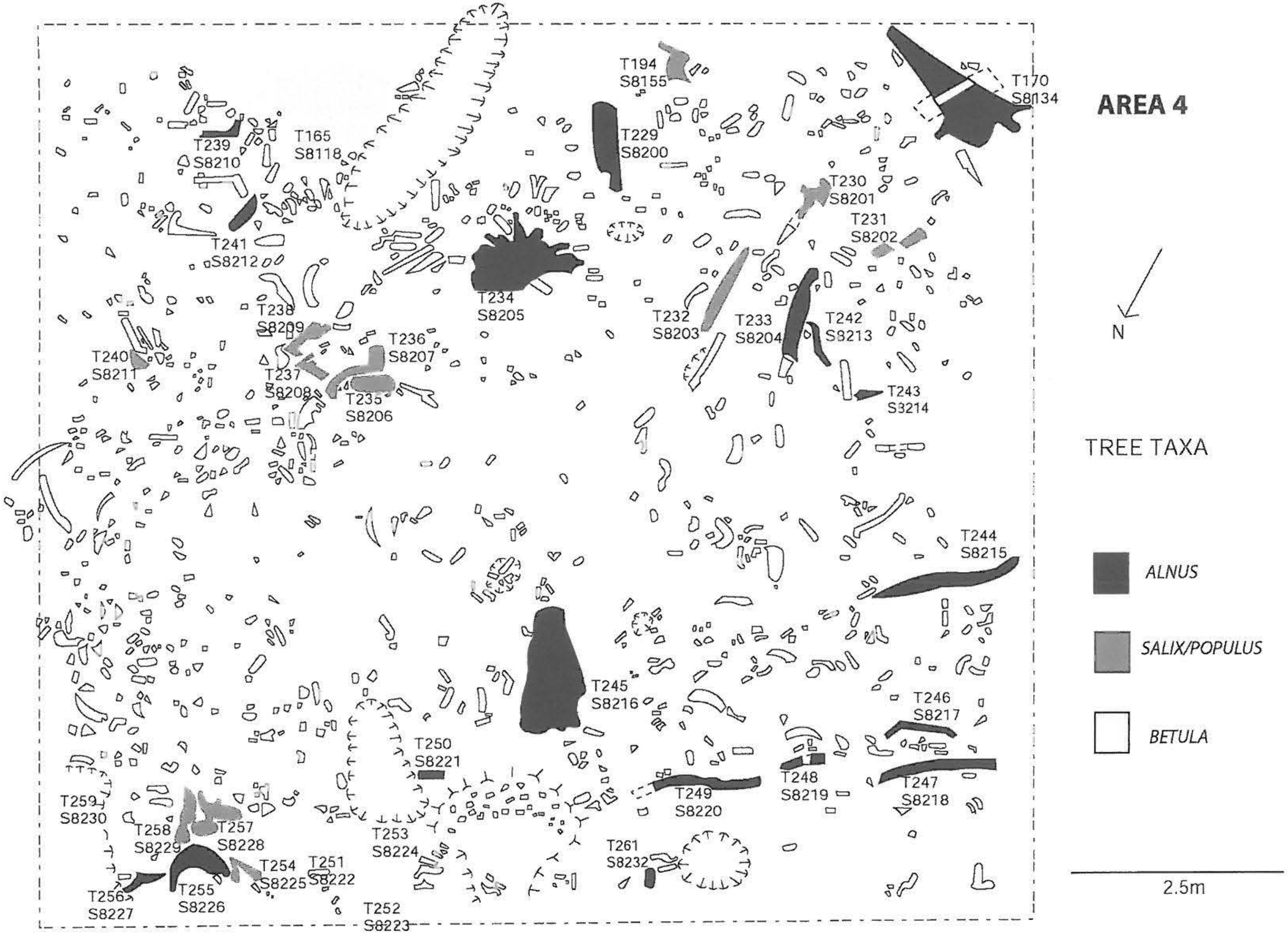

Figure 1: Goldcliff East upper submerged forest, Area 4 showing the distribution of tree taxa.

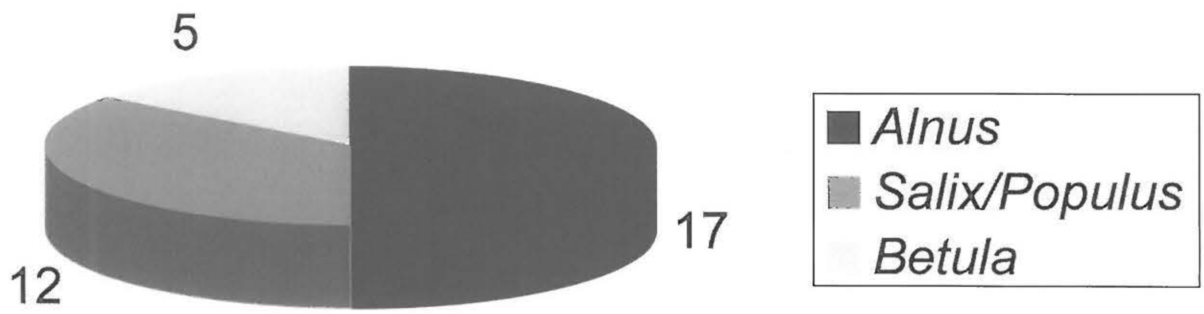

Figure 2: Wood identification results, Goldcliff East, Area 4, % of tree types.

Morgan (1989) pollen diagram during this carr woodland phase, although these may have formed drier woodland, for example on Goldcliff Island. Smith and Morgan (1989) suggest this carr woodland could have formed a stable environment for around 600 years. They did not identify any evidence of human impact in the pollen diagram (the earliest evidence occurs at the elm decline). The assumption is that the woodland was unable to survive due to inundation by rising sea-level.

ACKNOWLEDGEMENTS

I would like to thank my supervisors Prof. Martin Bell, Dr Petra Dark and Dr Michael Keith-Lucas for all their support and guidance. Thanks also to Dr Shaun Buckley and the other members of the N.E.R.C. project team. Special thanks to Miss Emma Paddock and all others who have helped in the field, without all of you this work could not have been carried out.

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