

West Sussex County Council

Designation Full Report



Geoarchaeological Landscape Character Areas

Number of records: 3

DesignUID: DWS9274	Type: Geoarchaeological Landscape Character Area	Status: Active
Preferred Ref	Unsu	Unsu

Name: Alluvium (Holocene Alluvium, Freshwater Alluvium)

Grade: **Assigned:** **Amended:** **Revoked:**

Legal Description

Suggested Text for DBA, EIA etc

The site is mapped by the BGS as being underlain by alluvium. While often weathered at the immediate surface, the alluvium can, even at relatively shallow depths, preserve important archaeology and palaeoenvironmental record. The alluvium provides the key records of local to regional-scale change in vegetation, climate and sea level, from almost 12,00 years ago to the present. It also preserves evidence for human impact on the landscape and responses to environmental change, from the Mesolithic to the present (Waller and Hamilton 2012; Groves et al. 2012). A range of depositional environments, from basal high energy gravels through silts and clays to localised peat and tufa may be present (Aldiss 2002), in places sequences may be more than 15m thick. Alluvium will include record of previously terrestrial landscapes and so large areas of human activity, including organic items and structures, from prehistoric to post-medieval; periods can be buried at depth and can remain exceptionally well preserved (Fox 1926; Margetts 2019). Determining the potential and significance of alluvial deposits will require geoarchaeological expertise and field approaches including bore holing and geophysics. Deposit modelling should be undertaken to determine potential at depth and allow the development for targeted mitigation of activity areas and important palaeoenvironmental records at depth (Carey et al. 2017).

BGS Code: ALV

Part of: Fluvial deposits (FLUV)

Age: c.11.7k B.P to present

Description

The flood plains of the major river valleys of the Arun, Adur, Sussex Rother and Lavant are largely mapped as alluvium. These present as a complex series of mineral and organic deposits representing a broad range of fluvial regimes. While surface outcrops often compromise weathered, low energy overbank deposits, sand, gravel and peats can be present at depth. Basal gravels, dating to the end of the last cold stage can typically be up to 5m in thickness (Aldiss 2002).

In places, associated with springs and peat development, tufa deposits may be locally present (Shepherd-Thorn 1975). Alluvium may vary from a few metres to more than 20m thickness at the mouth of the Arun and Adur. Given the alluvium spans the entire Holocene and indicates during periods off immediate post-glacial low sea level, the alluvial sequence may include marine, intertidal and terrestrial facies at different points. In smaller valley the alluvium may mask, at relatively shallow depth terrestrial landsurfaces with evidence ranging from prehistoric to post-medieval activities. The alluvium has the potential to preserve organic archaeological evidence (Fox 1926; Margetts 2019), including wooden structures as well as exceptional palaeoenvironmental sequences providing local to regional- scale histories of climate, sea level and environmental change. Alluvial records also can preserve the signature of human impact on landscapes at the catchment level (Waller and Hamilton 2012; Groves et al. 2012). They require specialist geoarchaeological study, including deposit

modelling, and multidisciplinary analysis in order to determine potential and significance of sequence at any given point.

References

Aldiss D.T. 2002. Geology of the Chichester and Bognor district — brief explanation of the geological map Sheet 317/332 Chichester and Bognor. British Geological Survey.

Carey, C., Howard, A.J., Jackson, R. and Brown, A., 2017. Using geoarchaeological deposit modelling as a framework for archaeological evaluation and mitigation in alluvial environments. Journal of Archaeological Science: Reports, 11, pp.658-673.

Fox, C., 1926. A 'dug-out' canoe from South Wales: With notes on the chronology, typology, and distribution of monoxylous craft in England and Wales. The Antiquaries Journal, 6(2), pp.121-151.

Groves, J.A., Waller, M.P., Grant, M.J. and Schofield, J.E., 2012. Long-term development of a cultural landscape: the origins and dynamics of lowland heathland in southern England. Vegetation History and Archaeobotany, 21(6), pp.453-470.

Margetts, A., 2019. On the verge of Wessex? A prehistoric landscape at Oldlands Farm, Bognor Regis, West Sussex. Sussex Archaeological Collections, 157, pp.47-81.

Shephard-Thorn, E R. 1975. The Quaternary of the Weald — a review. Proceedings of the Geologists' Association, Vol. 86, 537–547

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Curatorial Notes

Designating Organisation: University College of London Institute of Archaeology

Location

Grid Reference:

Map sheet: **Area (Ha):**

Administrative Areas

County West Sussex

Postal Addresses - None recorded

Designation History - None recorded

Sources - None recorded

Associated Monuments - None

Associated Consultations - None

Additional Information

List Locality:

List County:

DesignID: DWS9275 **Name:** Beach and Tidal Flat Deposits (including Channels in the Intertidal

Name: Beach and Tidal Flat Deposits (including Channels in the Intertidal Zone)

Grade: **Assigned:** **Amended:** **Revoked:**

Legal Description

Suggested Text for DBA, EIA etc.

The BGS maps the site as underlain by beach and tidal flat deposits. Consideration should be given to what these deposits might be masking at relatively shallow depth. This could include a wide spectrum of Quaternary deposits, from Pleistocene raised beach, head and alluvial deposits with archaeological potential (Bates et al 2009; West and Sparks 1960; West et al. 1984); through to Holocene alluvial deposits with the capacity to preserve rich palaeoenvironmental profiles and organic structures (Allen et al. 2002; Seager-Thomas 2001; and see notes for Peat). The intertidal zone represents a challenging working environment but one of huge potential and sensitivity requiring specialist, multidisciplinary consideration (Bates and Pope 2016)

BGS Code: BTFU

Part of: None

Age: c.11.7k to present

Description

The West Sussex coastline represents a dynamic and rapidly changeable environment which varies hugely in the degree to which it is under active management (Bone 2020). The BGS maps area of modern intertidal sediments and storm beach deposits which, in themselves are rarely considered in the planning process. However, these deposits can mask a wide range of deposits, Holocene and Pleistocene, which have archaeological and palaeoenvironmental potential. These can include extensive raised beach, head and brickearth deposits lain down in the Pleistocene, some associated with the MIS 5e Pagham Raised beach (Bates et al. 2009). Holocene colluvium and older alluvial deposits can also be present. Consideration should also be given to the presence of infilled channel crossing the intertidal zone (West et al 1960; West et al. Seager-Thomas 2001). These can include Middle Pleistocene examples such as the Earnley, Wittering and Selsey channels, which preserve organic deposits including plant macrofossils and mammalian fauna. Holocene channels (Allen et al. 2002), some of considerable size relating to the shoreward expression of the West Sussex rifes can also be present under thin tidal flat and beach deposit coverage. These like peat can preserve everything form wooden structures (Seager-Thomas 2001) to human remains (Murphy 2020).

References

- Aldiss D.T. 2002. Geology of the Chichester and Bognor district — brief explanation of the geological map Sheet 317/332 Chichester and Bognor. British Geological Survey.
- Allen, M. J., Bone, D. A., Mathews, C. and Scaife, R.G. 2002. Tree trunks, Bronze Age remains and an ancient channel exposed on the foreshore at Bognor Regis, West Sussex', Sussex Archaeological Collections 142, 7–23.
- Bates, M.R., Bates, C.R., Gibbard, P.L., Keen, D.H., Parfitt, S.A., Peglar, S.M., Schwenninger, J.L., Wenban-Smith, F.F. and Whittaker, J.E., 2009. Selsey, West Street: evaluation of historical material and recent field investigations. The Quaternary of the Solent Basin and West Sussex Raised Beaches. Field Guide, Quaternary Research Association, London, pp.73-95.
- Bates, M.R. and Pope, M.I 2016 Methods for reconstructing Ice Age Landscapes. Lost Landscapes of Palaeolithic Britain. Oxford Archaeology.
- Bone, D.A., 2020. Selsey and Bracklesham, West Sussex: a case study of the impact of coastal management on foreshore exposures and geological conservation. Proceedings of the Geologists' Association, 131(5), pp.432-442
- Murphy, P. 2020 "New archaeological recording on the beach at Medmerry, near Selsey, West Sussex."

Thomas, M.S., 2001. Two early first millennium BC wells at Selsey, West Sussex and their wider

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significance. The Antiquaries Journal, 81, pp.15-50.

West, R.G. and Sparks, B.W., 1960. Coastal interglacial deposits of the English Channel. Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences, 243(701), pp.95-133.

West, R. G., R. J. N. Devoy, B. M. Funnell, and J. E. Robinson. 1984. Pleistocene deposits at Earnley, Bracklesham Bay, Sussex." Philosophical Transactions of the Royal Society of London. B, Biological Sciences 306, no. 1127 (1984): 137-157.

Curatorial Notes

Designating Organisation: University College of London Institute of Archaeology

Location

Grid Reference: Centred TQ 06426 00035 (63683m by 15919m)

Map sheet: TQ00SE **Area (Ha):** 12,844,938.57

Administrative Areas

County West Sussex

Postal Addresses - None recorded

Designation History - None recorded

Sources - None recorded

Associated Monuments - None

Associated Consultations - None

Additional Information

List Locality:

List County:

DesigUID: DWS9270 **Type:** Geoarchaeological Landscape Character Area **Status:** Active

Preferred Ref **Unsu**ed **Un**used

Name: Head (Head Deposits)

Grade: **Assigned:** **Amended:** **Revoked:**

Legal Description

Suggested Text for DBA, EIA etc:

The site is mapped as being underlain by Head deposits. These deposits date to the Pleistocene and comprise highly variable sediments ranging from slope and fluvial deposits through to fine-grained, low-energy sediments and soil-horizons. They have been demonstrated to preserve in-situ prehistoric activity areas and important palaeoenvironmental signatures. The archaeological record could include nationally significant and well-constrained assemblages of cultural material through to internationally important early human butchery, quarry and settlement sites. Palaeoenvironmental material can include everything from pollen and molluscs through to megafauna and human fossils. Their age, potential and importance can only be determined through meaningful geoarchaeological evaluation.

BGS Code: -

Part of: Mass Movement Deposits

Age: c.750k to 11.7k years B.P

Type Site: None

Description:

Head is mapped by the BGS across large parts of West Sussex but especially covering large areas of the Upper Coastal Plain, within the dry valley bottoms of the South Downs escarpment, within the north-facing combe-valleys of the scarp slopes and within the Wealden drainage systems. It is one of the most important contexts for preserving archaeology and paleoenvironmental sequences, but it is highly variable and complex.

Head deposits formed through a variety of mechanisms but are usually characterised as mass movement deposits formed during the Pleistocene under peri-glacial freeze-thaw conditions. The great depths (up to 18m) of Head deposits that accumulated between 480,000 and 420,000 years ago as the cliff of the Westbourne-Arundel Raised Beach collapsed during the MIS12 cold stage are an example of significant accumulations of freeze-thaw deposits, formed by the deposition of successive lobes of mobile sediment. In the dry valleys slope and fluvial processes combined to form up to 10m of deposits formed by a variety of high and low energy processes. Head deposits, such as those of the Eartham Formation at Amey's Eartham Pit and the Norton Formation at Blackrock can contain fine-grained deposits relating to low energy accumulations of material including both wind-blown loess and soil formation. The latter may in some cases relate to short periods of warming during cold stages (interstadials) or actual interglacial.

Due to the highly variable processes that led to the formation of the Head, the deposits can be highly variable in their make-up. Deposits can range from relatively high-energy, sub-angular to sub-rounded gravels, through to low-energy finely-bedded silts and clays. Only through detailed records made by qualified specialists and careful sampling and analysis, including soil micromorphology studies, can the depositional narrative of a sequence be properly understood. Beyond the C14 dating of more recent Head deposits, dating can be attempted by OSL or ESR.

Head deposits have the potential to preserve archaeology either as broadly time-constrained accumulations, or as tightly time-constrained and primary-context, in-situ activity areas. It is worth nothing that the terrestrial elements of the exceptional Boxgrove landscape archaeological record are preserved within deposits mapped as Head by the BGS. Nationally, this deposit has been proven to preserve some of the most important archaeological records of the Pleistocene.

Head deposits also have the potential to preserve important palaeoenvironmental remains. While often decalcified towards the surface, below an often sharp demarcation, calcareous deposits have the potential to preserve both vertebrate and mollusc fauna. The dry valley Head deposits are known to preserve faunal elements from woolly mammoth, woolly rhinoceros, horse etc as. At locations such as Horton Pit and Burton Park, Head deposits preserved rare assemblages of Pleistocene fauna from the Weald including mammoth and reindeer. In Slindon Bottom organic-rich sediments were found within Head deposits preserving pollen and macroscopic plant remains.

References:

Bates, M.R., Briant, R.M., Rhodes, E.J., Schwenninger, J.L. and Whittaker, J.E., 2010. A new chronological framework for Middle and Upper Pleistocene landscape evolution in the Sussex/Hampshire Coastal Corridor, UK. *Proceedings of the Geologists' Association*, 121(4), pp.369-392.

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Curatorial Notes

Designating Organisation: University College of London Institute of Archaeology

Location

Grid Reference:

Map sheet:

Area (Ha):

Administrative Areas

County West Sussex

Postal Addresses - None recorded

Designation History - None recorded

Sources - None recorded

Associated Monuments

MWS14477	Monument: Cropmarks of Rectilinear Enclosures and Ditches, Tortington, Arundel
MWS14478	Monument: An Area of Medieval Ridge and Furrow, Tortington, Arundel
MWS14479	Monument: Cropmark of a Length of Possible Trackway, Tortington, Arundel
MWS14480	Monument: Cropmark of Fragmented Ditches possibly representing a Trackway or Boundary, Tortington, Arundel
MWS26716	Listed Building: Pigeon House, Angmering

Associated Consultations - None

Additional Information

List Locality:

List County:
