
A late Bronze Age logboat from the Tay estuary at Carpow, Perth and Kinross

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Introduction

Discovery

The discovery of a logboat, partially buried in tidal mud-flats at Carpow Bank on the Tay estuary, was initially reported to Dundee Museum in September 2001 (Strachan 2001). The study of this highly significant vessel would not have been possible without its prompt and conscientious reporting by Scott McGuckin, a metal-detectorist working out of Dundee. In September of that year a site visit was made by staff from Perth and Kinross Heritage Trust (PKHT); Historic Scotland (HS); The Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS); the National Museum of Scotland (NMS) and Perth Museum and Art Gallery (PMAG). The find was confirmed as a logboat, with c 5m of the vessel exposed from the sands, gravels and estuarine mud. The exposed end, assumed to be the bow of the craft, was found pointing upstream, while the stern remained buried. The vessel was aligned almost E–W.

Strategies for recording and *in situ* management were developed, with the main priorities being to establish the date and full length of the vessel, while assessing the condition of the buried portion. The following describes the results of two excavations carried out in October 2002 and July 2003 (Strachan and Glendinning 2002 and 2003) in addition to numerous monitoring visits undertaken since 2001.

Location

The logboat (NGR NO 2001 1859; NMRS: NO21NW 161) is located on the lower inter-tidal mudflats of Carpow bank on the south side of the estuary where the rivers Earn and the Tay meet to form the head of the estuary proper (Illus 1). The site, which is in the parish of Abernethy, has a number of environmental designations, including Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA). The vessel is partially buried in inter-tidal mud, sands and gravels on an eroding peat shelf. The peat would have originally formed a continual bed across the flats, however in parts of the bank the peat has eroded into isolated blocks of variable thickness. In some cases the peat exposures have been undercut by erosion leaving fossil stumps exposed. The peat deposits are likely to date from around 7,500 and 8,500 BP, based on dates obtained at Innerneathy and Cordon (Cullingford et al 1980), both of which are within 1km of the site.

The tidal amplitude of the inter-tidal zone at Carpow bank is seriously affected by the volume of water flowing downstream as result of rainfall and/or snow-melt. Experience has shown that only a low spring tide (with a predicted height of less than 1m OD at Dundee) preceded by a dry period of around one week will give a tidal window of around 3–4 hours when the logboat is exposed. The inter-tidal nature of the excavations placed serious limits on the extent of information recovered. Despite the use of water-pumps, excavation was constantly hampered by persistent flooding, and the buried stern was revealed only for a few minutes to allow photography and basic measurements to be taken.

Description of the vessel

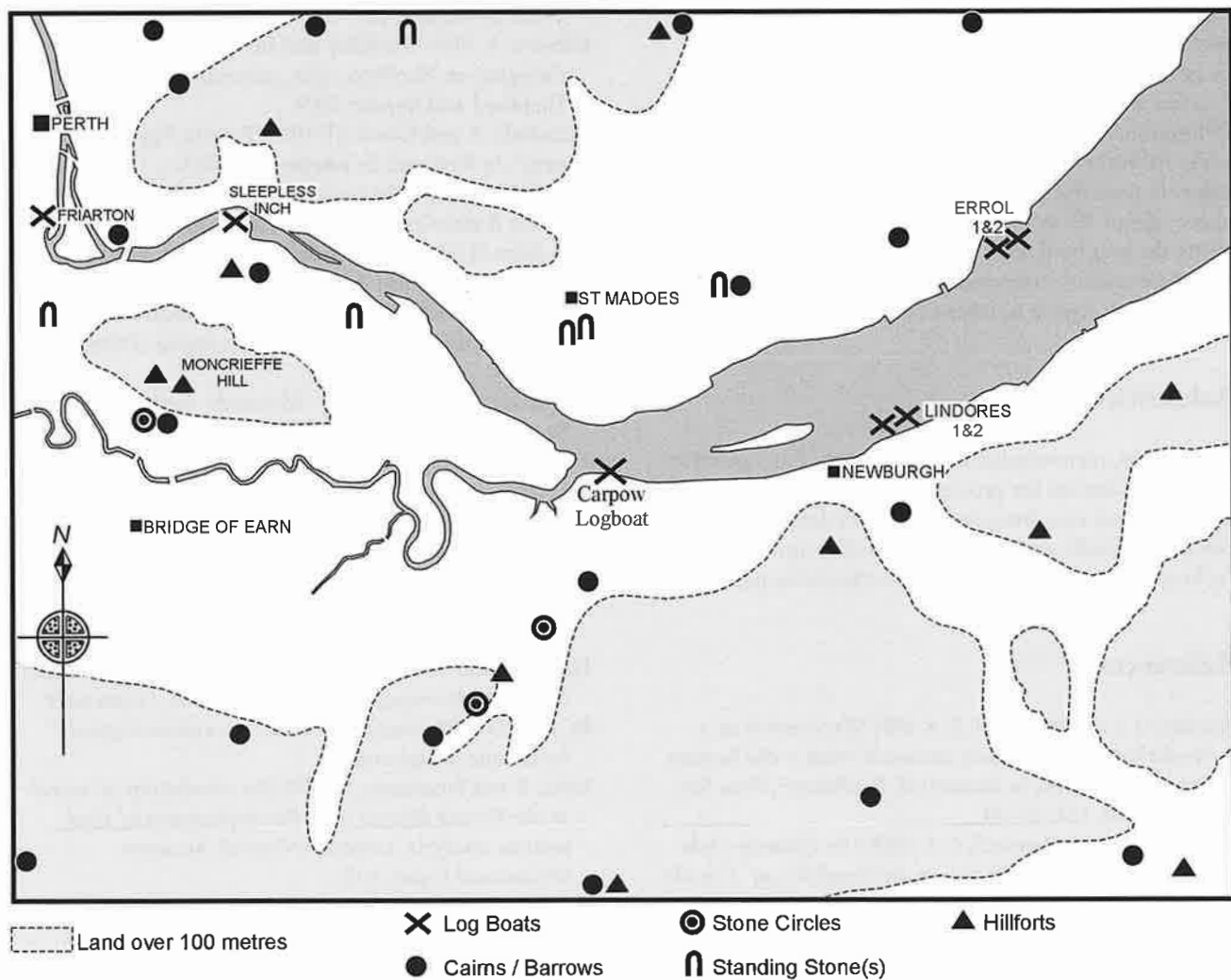
Dating

A single radiocarbon date (GU-9597) was recovered from the bow of the vessel (Illus 2) and produced a radiocarbon age of 2885 ± 50 years BP, producing calibrated dates of cal 1130–970 BC (1 sigma) and cal 1220–910 BC (2 sigma).

While the timber has been confirmed as being of slow-grown oak, suitable for dendrochronology (Crone pers comm), the reductive nature of logboat manufacture often makes dendrochronological dating impossible. The accuracy afforded by a dendrochronological date would eradicate the old wood factor associated with radiocarbon dating (Fry 2000, 45–6), however, and so remains a priority for future study.

Form

The exposed section of the vessel is highly abraded with some signs of rot being evident, particularly on the tops of the sides. In addition, some splitting has occurred. The water-logged timber has been identified (Crone pers comm) as oak (*Quercus sp.*) of reasonably high quality with only one knot being apparent at the exposed end. Abrasion has removed any traces of tool-marks or faceting on the exposed section. The vessel is c 0.9m in width and two full profiles and a partial profile were recorded (Illus 2). The erosion on the exposed part of the vessel is a result of tidal action, with sands and gravels scouring the surface of the vessel with each tide. In addition, the regular exposure of this part of the craft to the air during low tides has resulted in some rotting of the wood, increasing the effects of the tidal waters.



Illus 1 The location of Carpow bank on the Tay estuary, showing the distribution of possibly contemporary monuments (based on the National Monuments Record data) and other recorded logboats



Illus 3 The stern of the vessel during excavation, showing a detail of the transom-board.
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Excavation at the stern showed the full length of the vessel to be c 9.25m, and revealed the condition of the buried portion of the vessel to be excellent, having suffered little erosion from either tidal action or regular exposure to the air.

The vessel is of dissimilar-ended form, having a detached transom-board surviving *in situ* within a transom-groove. The transom-board itself is presumed to be a tangentially-cut plank, however, this could not be confirmed as the grain of the timber is obscured by a mineral deposit coating the buried part of the vessel. The transom-board was found to be c 6cm thick and tapered to a point where contact was made with the transom-groove (Illus 3).

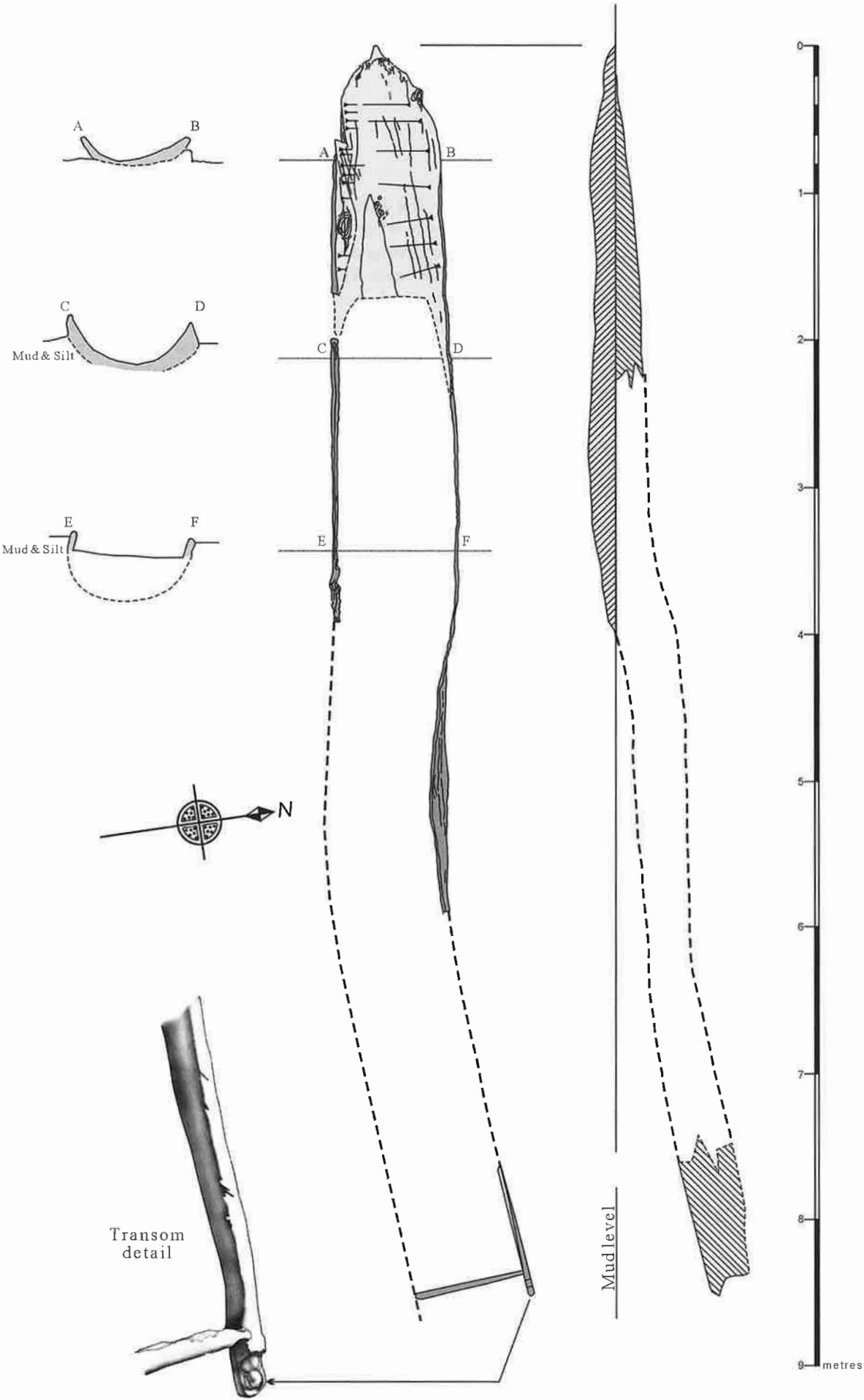
Due to the limited nature of the excavation and the information recovered it is not possible to describe all aspects of the exact form of the vessel using the McGrail morphology code (McGrail 1978, 129–30), however it is likely to be a variant of 44B2:112:322. Other details of interest include a circular hole, c 8cm in diameter, cut through the side of the vessel to the rear of the transom board and roughly circular feature, c 8cm in diameter, cut onto the top of the side of the vessel, also to the rear of the transom board. Both these features are currently of unidentified function. The circular hole shows signs of abrasion from a rope and may relate to mooring, however, while the vertically-cut depression may be a retaining feature for an external fitting (Mowat pers comm). Given the date of the vessel, it is likely that such detailed wood-working on the vessel (Illus 3) is a reflection of the extended tool-kit available in the Late Bronze Age. No associated structures or artefacts were identified.

The excavations did demonstrate, however, that the boat lies at an angle, with the bow lying on the current

ground surface, while the top of the stern is buried c 0.75m below the surface. In addition, while the boat is generally well preserved, when viewed in plan it is clear that some distortion has taken place, as the stern lies at a noticeably different angle from the main body of the craft. Indeed, it is possible that the vessel may actually be in two separate pieces, although it is more probable that the vessel has simply warped *in situ*.

Discussion

While little can be said of the find in relation to prehistoric sites in the immediate area, the vessel was probably used to exploit the rich river and estuarine environments of the Earn and the Tay in a similar way as has been documented on other east coast estuaries (for example Van de Noort and Ellis 1995, and Wilkinson and Murphy 1995). Indeed it is worth noting that the topography of the lower Tay, and the Tay estuary, is in many ways reminiscent of Fenland or parts of the low-lying coast of East Anglia. Further it is likely that this comparison would have been far more noticeable prior to drainage, reclamation and conversion to arable land of low-lying areas where salt-marsh and coastal grasses would have existed. The sizable group of recorded logboats from the Tay estuary reflects the suitability of this type of craft to the shallow sheltered waters that exist there. Activities such as fishing and wild-fowling, in addition to the transportation of goods and people, are the most probable uses of the vessel, and it is likely that this formed part of a wider exploitation of the wetlands surrounding the estuary augmenting subsistence from agriculture.



Illus 2 Plans and sections of the vessel, including a schematic detail of the stern. (© Perth and Kinross Heritage Trust)

The distribution of possible contemporary activity in lower Strathearn and the Tay Estuary is primarily represented by ritual and funerary monuments (Illus 1) and an extensive scatter of Late Bronze Age metalwork (Cowie and Hall 2001, 6, Illus 3). As a result, our understanding of settlement and economy of the area at this time is limited. The analysis of pollen remains from Moncrieffe suggests agricultural activity in the area in the late third millennium BC (Caseldine 1983). In addition, a later prehistoric origin is possible for a number of probable settlement sites recorded as crop marks on the Carse of Gowrie; at the foot of the Ochil hills between Newburgh and Abernethy; and at the foot of Moncrieffe Hill. While none of these are securely dated, it is possible that some may have had origins in the Late Bronze Age. Indeed, the latter sites around Moncrieffe Hill may be related to the ritual activity at Moncrieffe stone circle (Stewart et al 1986). Finally, it is conceivable that one or more of the hillforts in the area may have had origins in the Late Bronze Age (Illus 1), as has already been suggested again at Moncrieffe (Cowie and Hall 2001, 10).

The vessel is broadly comparable in date to Late Bronze Age metalwork possibly ritually deposited in the river Tay between Perth and Newburgh (Cowie and Hall, *ibid*, 8–11), and while no direct association can be made, a possible ritual association for the Carpow vessel should be considered. For example, at Fiskerton, Lincolnshire, a votive deposition has been interpreted for one of two logboats recently excavated at an Iron Age timber causeway. The vessel was apparently deposited in pristine condition and set between two clusters of posts and pegged into position. A large assemblage of other artefacts interpreted as votive offerings were discovered, including a sword, an iron dagger, a spear, numerous pieces of bronze and a socketed axe, the latter a skeuomorph of Later Bronze Age examples (Field et al 2003). If the suggestion that this section of the Tay was the focus for ritual deposition activity, as suggested above, is accepted, then it is possible that such activity may have required the use of a logboat. Indeed, given the example of Fiskerton, then deliberate sinking of the vessel, at some point, cannot be ruled out.

Whatever the function of the Carpow vessel, it is likely that it was propelled by a combination of paddling in deeper waters and poling or punting in shallow water. The Canewdon paddle from the Essex coast (Wilkinson and Murphy, *Ibid*, 152–7) is contemporary with the Carpow logboat and may give some indication of the type of paddle employed. The paddle is of oak and is notable for its length (2.08m) and quality of workmanship, having a diamond-shaped blade and shaft of c 50mm diameter.

It is considered likely, given the orientation of the vessel and the angle at which it is partly buried, that it was deposited on the bank having been carried downstream from either the river Tay or the Earn. It is noticeable that the peat shelf of the bank currently acts as a weir, collecting items washed downstream during ebb tides.

Significance of the vessel

There are records of eight logboats recovered from the Tay estuary (Mowat 1996 *passim*), the majority of which

were discovered in the 19th century at a time of extensive dredging and localised fishing. One of those recorded (NMRS NO12SW 210) survives only as a fragment in Roxburgh District Museum, Hawick, and may well be part of one of the vessels listed below. The following summarises the other vessels from the estuary, giving NMRS references and NGRs:

Barry Links (NO53SW 39) c NO 53 32 Discovered in a buried layer of peat during drainage works to the E of Monifieth, around 1.6km from the shoreline, in 1820.

Errol 1 (NO22SE 5) c NO 26 22 Found 1869 in the estuarine sand-bank called Haddiebank, the vessel was in poor condition.

Errol 2 (NO22SE 4) c NO 26 22 Found 1895 by fishermen at Haddiebank. An oak vessel, c 9m long and c 1.5m wide. A variant on the dissimilar-ended type, the vessel has suffered badly from splitting.

Friarton (NO12SW 24) NO 1175 2192 Geikie in 1878 recorded the remains of a logboat found some years previously during clay-digging at the Friarton brick-works. The vessel was considerably damaged before examination, although it was identified as 'Scotch fir'.

Lindores 1–2 (NO12SW 62 and NO21NW 6) NO 24 19 Around 1816 two logboats were found in the area of Cruive Bank. Apparently well preserved, both were cut up to serve as building-lintels.

Sleepless Inch (NO12SW 211) c NO 146 220

In 1848 part of a logboat, c 7m in length, was recovered however no further details survive.

Of the above group, only the Errol 2 vessel survives, and it is currently on display in Dundee Museum and Art Gallery. Indeed, Errol 2 is the only vessel from the group that is securely dated, having produced radiocarbon dates of 485 ± 40 ad (Q-3121) and 430 ± 45 ad (Q-3141), giving calibrated dates of c 599 and c 548 cal AD. Geikie (1880) records that the Friarton vessel was found on the upper surface of the peat and sand layers that underlie the deep brickearth deposited during marine transgression dated to c 8,000–6,000 bp, and Mowat notes that, assuming Geikie's account is correct, then a date of the later 6th millennium bc may be attributed to the boat. The exact location of the discovery of the Friarton vessel is not known, however, and the early nature of the account must bring into question the validity of this date. Indeed, the Carpow vessel, partly buried in peats deposited over four thousand years before, is a reminder of dynamic nature of objects and sediments in the coastal zone.

Lanting (2000) notes that of the 700–750 recorded logboats from the Britain and Ireland, of which only 131 have been dated, prehistoric logboats are relatively rare. Indeed, the peak of the British series occurs from around 1050–1300 AD (Lanting *ibid*, 630). Very few of the 150 or so recorded Scottish examples have been dated, and the vast majority of these have proved to be post-Roman to medieval in date. The Late Bronze Age date for the Carpow vessel makes it one of only five from Scotland dating from the second/first millennium BC, the others being Erskine 6; Loch Arthur 1; Catherinefield (Mowat 1996, 129) and the Kenmore vessel from Loch Tay (Andrian *pers comm*). The latter of these is broadly comparable in date, having produced

a single radiocarbon age (GU-10558) of 3230 ± 50 BP, producing calibrated dates of cal 1630–1400 BC (1 sigma) and cal 1530–1430 BC (2 sigma).

In addition the Carpow vessel is well preserved, particularly the stern, as intact transom-boards are rare, and we can only speculate as to what other features may survive elsewhere on the vessel. Finally the significance of the Carpow vessel is not only its early date and good state of preservation, but also the fact that it is one of a very few Scottish logboats to be recorded, and potentially recovered and preserved, using techniques of modern archaeology and conservation.

Management

Further to the excavation, the vessel has been sand-bagged as an interim measure of protection against further erosion, transportation or damage from objects carried by the tide. In addition, sand-bagging should minimise the effects of exposure to air during low tides. Monitoring of this site is ongoing on a quarterly basis, and to date has confirmed that the high-energy inter-tidal environment of Carpow continues to erode both the peat deposits and the vessel when exposed to scouring. Various options for the long-term preservation of the vessel are currently being considered, including preservation *in situ* and lifting, conservation and display.

Acknowledgements

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Abstract

A partially buried logboat discovered at Carpow bank on the Tay estuary has produced a radiocarbon date of around 1,000 cal BC, and small-scale excavation has shown that it was c9.25m in length and c 0.9m wide. While the exposed portion of the vessel is highly abraded, excavation has shown the buried stern to be in excellent condition, retaining its detachable transom board. The vessel has been sand-bagged for protection and is currently being monitored while the long-term preservation of the vessel is considered.

Keywords

Carpow
inter-tidal zone
late Bronze Age
logboat
River Tay
Tay estuary

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