

FROM PROBLEM TO OPPORTUNITY: responses to coastal erosion in Scotland

The coastal and intertidal zones are our most dynamic environments, vulnerable to unique climate change challenges. Coastal change and erosion are a result of natural processes and have always affected our shores, but they will be exacerbated by climate impacts. Higher waves and rising sea levels will accelerate the pace of change and increasingly threaten fragile landscapes.

Our coastline has long been a locus of settlement and activity, taking advantage of access to marine resources, transport opportunities and fertile land, particularly in Scotland, with its mountainous interior. Thus, much of our archaeological heritage is concentrated along our shores and is therefore especially vulnerable to climate-driven loss. The situation is further complicated by sea level rise and despite a history of isostatic rebound in parts of the country, the most recent data shows that all of Scotland is now affected and that the rate is increasing. With rising seas, stretches of our coastline will fall within the reach of higher waves more frequently, causing severe erosion and endangering a significant and growing proportion of our archaeological heritage. Threatened sites encompass the breadth of human activities ranging from Scotland's first settlers to the 20th century.

Over the past 20 years, the SCAPE Trust, supported by Historic Environment Scotland, has worked to address this problem across Scotland. Through the Shorewatch project and more recently ShoreUPDATE (part of the Scotland's Coastal Heritage at Risk Project, SCHARP) SCAPE has trained volunteers to become citizen archaeologists, working with them to survey coastal sites and monitor change. However, observation alone does not save sites, and the threat demands a further response.

Ellie Graham ACIfA (6180), The SCAPE Trust

A handful of archaeological sites have been protected by the construction of stone walls, but such defences are expensive to build and maintain and often inappropriate for many places. Other solutions need to be found, and practical projects at eroding sites have turned the problem of erosion and the destruction of archaeological sites into an opportunity to learn from the process of loss, to engage with communities all around the coast and to gain benefit from the heritage before it vanishes.

Examples include the survey of a submerged forest on a beach at Lionacleit, Benbecula, in May 2018. This mapped the remains of trees within intertidal peats and identified a predominantly willow and birch woodland with some Scots pine, the remains of a once-widespread forest across what is now the Western Isles archipelago. Reflecting the long history of change here, the woodland declined from around 4500 to 4000 BC as sea levels rose, the climate became wetter



Two stone features near the high water mark on the beach are probably the remains of eroded structures. Credit: SCAPE

and windier, and human activity altered the landscape. First brought to SCAPE's attention by the local community, this beach also contained evidence of later prehistoric settlement. A sub-circular arrangement of boulders and curvilinear stone alignment may represent a house and enclosure, recently exposed by the loss of sand from the dune hinterland. Associated cultural deposits have been scoured out by the tide, leaving the heavier stones to settle as 'ghost' structures on the foreshore. The nearby peat shelf contained a cluster of bone from a small cow, bearing cut marks and closely associated with struck quartz flakes. Yielding radiocarbon dates of 1800–1600 BC, this probably represents an in-situ Early Bronze Age butchery site, a possibly unique snapshot of a moment in time, preserved in the peat but only rescued from imminent loss by the sharp eyes of a well-informed volunteer engaged with the local coastal heritage.

In Brora, East Sutherland, once known as the industrial capital of the Highlands, a stub of stone walling protruding from a dune intrigued the village community. This led to a full excavation, completed in 2010 by SCAPE and the Clyne Heritage Society. It revealed a 16th-century saltworks, shedding new light onto early modern salt production and the earliest industrial heritage in Brora. Although it collapsed in December 2011 when the sand dunes were dramatically eroded by a storm, this unique stone building had been fully recorded before its complete destruction.

Ellie Graham

Ellie joined the SCAPE Trust in 2012 as part of the Scotland's Coastal Heritage at Risk Project (www.scharp.co.uk), which works with volunteers around the country to record vulnerable coastal heritage (ShoreUPDATE) and investigate locally valued threatened sites (ShoreDIGs). As coastal archaeology encompasses all periods, she is interested in sites of all types as well as in developing strong collaborations to integrate community archaeology with research and heritage management.

Facing the urgent threat of loss where sites can't be saved, partnership working can rescue archaeological information, achieve preservation by record of the most vulnerable sites and develop a community of volunteers who are engaged and informed – not only about their heritage but also with the increasing challenges posed by climate change.



Fragments of bone and quartz flakes eroding from the intertidal peat preserve the story of a single event in the Early Bronze Age but were excavated just in time to rescue them from the sea. Credit: Simon Davies



Before, during and after: the saltworks at Brora, (left) first visible as a fragment of stone walling in the dune face; (top) community excavation in 2010; (right) destroyed by a winter storm in late 2011. Credit: SCAPE