LUSKENTYRE TO CORRAN SEILEBOST

OS Grid Reference: NG057973–NB068004

Introduction

Luskentyre Banks and Corran Seilebost are twin peninsulas that enclose the vast intertidal sand beach of Tràigh Luskentyre on the west coast of Harris (see Figure9.1 for general location). They are both unusual settings for machair development but have several distinctive features and may represent the remnants of a once larger system. Luskentyre is of interest as a dynamic beach–dune–machair system with substantial dune development, whereas Seilebost incorporates a beach–dune–machair system backed by saltmarsh and extensive areas of intertidal sand. Only the seaward tip of Seilebost is a true sand-spit with identifiable growth stages and a landward curve. Together the Luskentyre and Corran Seilebost system has the appearance of being set within a structural trough that has been subject to submergence and represents a single dynamic depositional complex that is of great geomorphological interest.

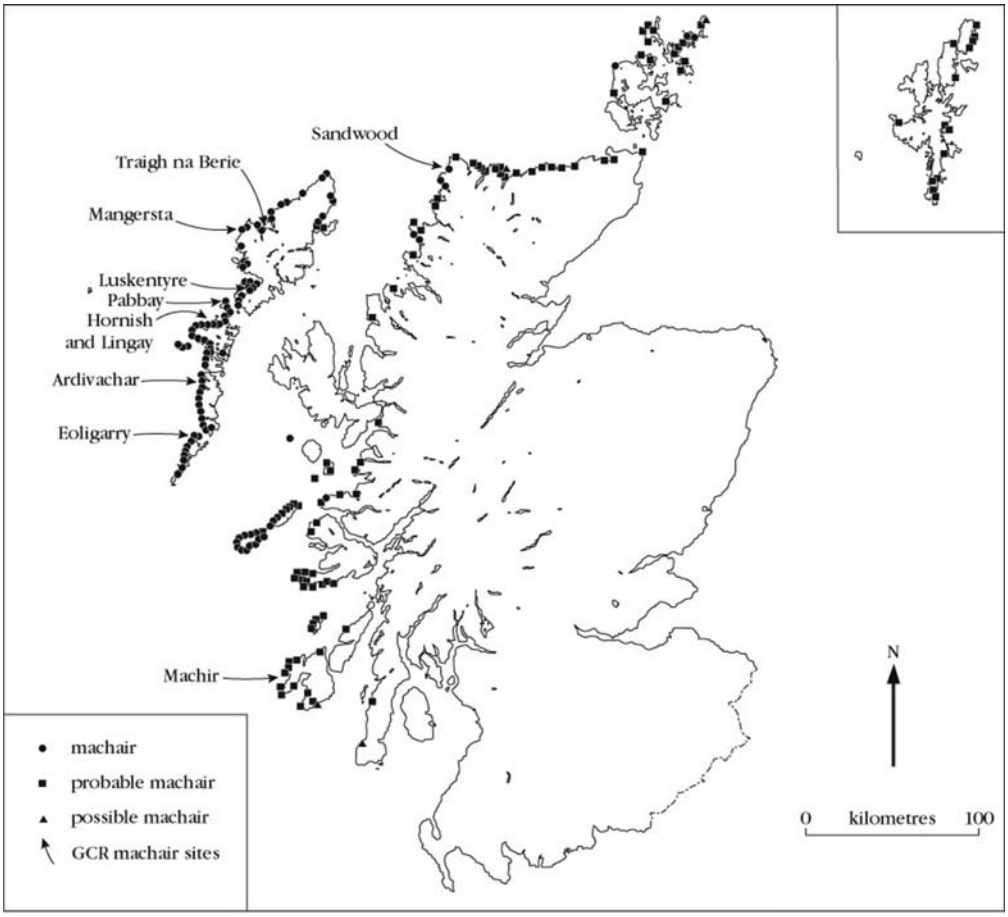

Figure 9.1: Distribution of machair in Scotland. Other than Sandwood, Torrisdale and Balta (see Chapter 7), all the sites included in the GCR fulfil both the geomorphological and vegetational definition of machair. Small vegetational differences in the above sites have resulted in the label 'probable machair'. Ongoing work that interprets the geomorphology and botany of machair aims to provide a definitive machair diagnostic test in the future and so the above classification will be subject to slight modification (Angus, 2003, pers. comm.). (After Hansom and Angus, 2001.)

Description

The Luskentyre–Corran Seilebost site extends for 3 km from the northern tip of the Luskentyre Banks to the southern extremity of the Corran Seilebost spit. At its widest it reaches a little over 1 km from mean low-water spings to the south of Tràigh Rosamol to the southernmost

part of Luskentyre Dunes (east of area (1) Figure 9.14). The intertidal sandflats and saltings of Tràigh Luskentyre are an integral part of the coastal geomorphological system; they are also important for ornithological reasons.

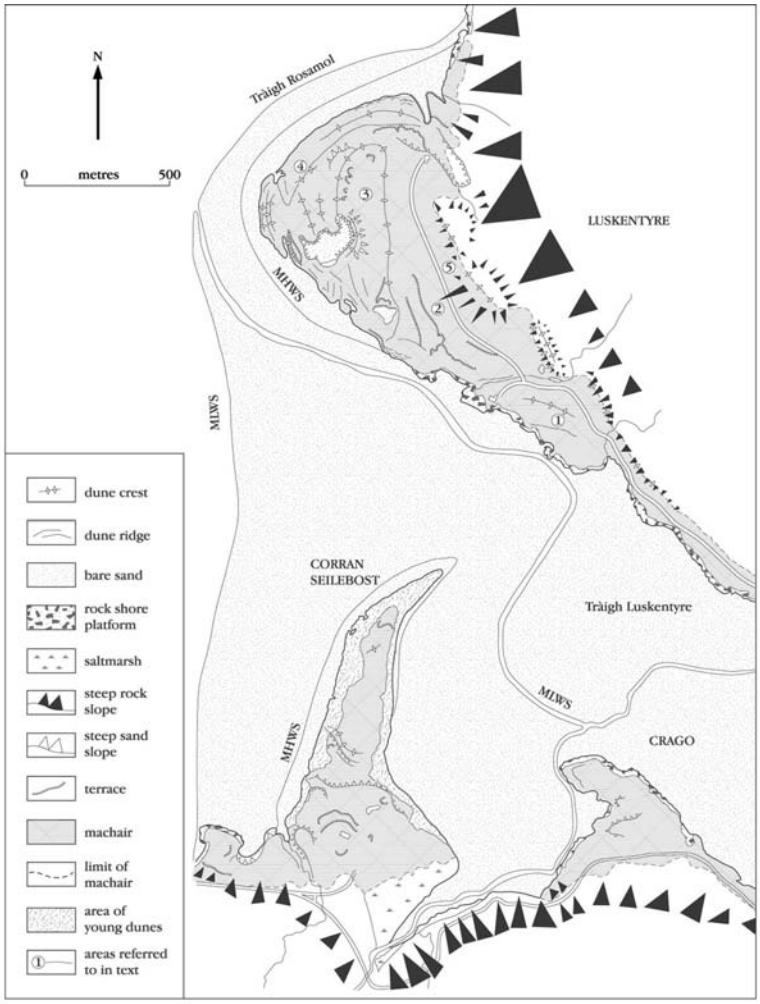

Figure 9.14: The geomorphology of Luskentyre and Corran Seilebost. Extensive intertidal sands front the dune and machair landforms of Luskentyre where several large blowthroughs occur. The dunes reach 35 m OD and are the highest free-standing dunes in Harris. Numbered locations on Luskentyre are referred to in the text. The complex of beach–dune–machair features may be the remnant of a once-larger machair that has been fragmented by submergence. (After Ritchie and Mather, 1970b.)

Tràigh Luskentyre occupies an inlet that extends inland 4 km to the south-east and is characterized by intertidal sandflats crossed by a single tidal channel that is subject to lateral migration. In 1996 the channel approached close to the tip of the spit at Corran Seilebost (see Figure 9.15; MacTaggart, 1997c). Well-developed mega-ripples on the intertidal sandflats indicate that ebb velocities are an important factor in the redistribution of sediments within the embayment. Sandy saltmarsh communities have developed in the more sheltered places within the inlet, such as in the lee of the promontory of Corran Seilebost and at the mouths of several freshwater streams that drain onto the sandflat. Enclosing the seaward end of the sandflats of Tràigh Luskentyre are the twin promontories of Luskentyre Banks in the north and Corran Seilebost in the south.

Figure 9.15: The rocky peninsula of Crago lies in the foreground of this aerial oblique looking north-west over Tràigh Luskentyre to the dunes and machair beyond. The western tip is highly active with clear evidence of extensive wind-blow. The free-standing spit of the tip of Corran Seilebost is also in view in the centre left. The island of Taransay (at the top) provides shelter from westerly waves. (Photo: P. and A. Macdonald/SNH.)

Luskentyre Banks forms a bulbous triangular-shaped foreland jutting out from the steep rocky slopes of mainland Harris towards the island of Taransay (Figure 9.15). The beach of Tràigh Rosamol in the north is hinged onto the southern part of the rocky promontory of Aird Groadnish and curves west to reach 300 m wide at the point of Luskentyre Banks. The beach continues to the south-east and narrows to 50 m at a second rocky promontory close to Luskentyre settlement. The beach is composed of fine-grained sand of 0.22 mm diameter, of which some 54% is shell (Ritchie and Mather, 1970b). Outcrops of calcarenite occur at mean low-water springs along this part of the foreland (Ritchie and Mather, 1970b). The southern end of Tràigh Rosamol is backed by a single ridge of 2–3 m-high dunes. The seaward edge of the dunes increases in height to the north where several marram-clad ridges have developed, probably reflecting a sand supply from the south. The northernmost extremity of Tràigh Rosamol is marked by a locally undercut dune edge and a deep sand-floored erosion corridor across which drains a small stream (Figure 9.14). To the east of the point, the coastal edge is accretionary with low dunes developed in front of the higher, more stable dunes behind. However, towards the south-east, the low accretionary ridge narrows and the backing dunes become progressively undercut to produce dune faces of up to 20 m high. In the extreme south-east of the site, the coastal edge is rocky with a thin veneer of machair.

Ritchie and Mather (1970b) and Harris and Ritchie (1989) described the landforms of the foreland in terms of areas approximating those numbered on Figure 9.14. In the east of the site in area 1, an area of dunes is dissected by a partly stabilized blowthrough system that is now being undercut at its seaward edge. To the north-west of this in area 2, an old and stable machair surface is dissected by a series of blowthroughs of varying sizes to produce a chaotic

surface surrounding a long and stable blowthrough corridor that has extended to the north. Area 3 to the north-west of area 2 consists of a series of U-shaped blowthroughs, dune ridges and conical sand dunes that reach over 35 m OD, the highest free-standing dunes in Harris. The conical dunes appear to be recent re-depositional features superimposed on the top of an earlier central high ridge system. This high surface is impressively dissected in the south by both elongate and cauldron-form blowthroughs, the largest of which is a long-established feature surrounded on all sides by exposed sand escarpments of up to 35 m OD and which tower above the blowthrough floor lying at a few metres above OD (Figure9.15; MacTaggart, 1997c). Outcrops of calcarenite occur on the floor of the blowthrough. Since Mather and Ritchie (1970) described the feature, the seaward end of the main blowthrough has been sealed by the deposition of a ridge of new dunes, although north-trending blowthroughs have subsequently developed along the advancing northern apex of the main blowthrough (MacTaggart, 1997c). In the northern part of area 3, the high sand ridge is dissected by a number of blowthroughs that have also extended northwards as a series of unvegetated sand waves with steeply sloping (30°) leading edges that inundate area 4 to the north. Area 3 is separated from the active coastal edge by area 4, an extensive, high, mature dune-plateau that reaches 20 m OD. Stable sand dunes have been superimposed on top of the older surface. The northernmost parts of areas 3 and 5 are truncated by the landward extension of the sand-floored erosion corridor at the north end of Tràigh Rosamol. The sides of this gorge-like form are cut into machair sand in the north and bedrock in the south and probably represent a fault-controlled stream incision that has become partly machair-filled. Area 5 represents a high, but gently sloping, surface of extensive hill machair that is used intensively for cultivation and grazing and that masks the underlying glacially moulded surfaces of the hill-slopes above.

Corran Seilebost is a peninsula of about 700 m wide at its root against the rocky knoll of Aird Horgabost in the south. From here it progressively narrows for 1.3 km northwards to a narrow neck of sand. On the west side, Tràigh Seilebost is a straight and gently sloping beach that extends seawards for 300 m and includes wave-built swash bars. On the east, the extremely gentle slope of the intertidal sandflats of Tràigh Luskentyre extends inland. The western coastal edge is backed by a nearly continuous foredune ridge of up to 10 m high, except in the south where the foreshore is backed by an undercut old and stable machair surface. Towards the north of the peninsula a healthy and prograding foredune ridge with extensive marram *Ammophila arenaria* cover has developed, although this becomes subject to wave undercutting towards a low sand-spit that extends north from the tip of the peninsula. The spit is highly dynamic and can lose much of the tip in a single storm, followed by a period of slow rebuilding. Where the spit begins to curve to the north-east, a few small blowthroughs have now been sealed by the development of foredunes across their seaward entrances (MacTaggart, 1997c). The dunes of the east face of the peninisula are lower than in the west but are subject to wave undercutting at high tide so that bare sand slopes characterize much of the Tràigh Luskentyre shore. Most of the central core of the peninsula is composed of dune ridges of varying sizes, some of these well-vegetated features recurving north and east where the spit has extended. In the south of the peninsula, the dunes extend to cover most of the edge of the higher machair surfaces behind. These older machair surfaces support several dune ridges and escarpments that trend west–east across the peninsula but they also occur as flat-topped features or form gentle aprons over the surrounding slopes. To the east of the machair area a small area of saltmarsh has developed with mature features such as tidal creeks and salt-pans. The seaward edge is undercut but the landward edge grades into sloping machair surfaces.

Interpretation

There seems no reason to suppose that the development of the Luskentyre–Corran Seilebost system should be substantially different in its response to Holocene sea level and sediment supply constraints than other machair systems in the Western Isles such as, for example at Mangersta or Hornish. Holocene sea-level rise slowed to a much reduced rate post-6500 years BP (Hansom and Angus, 2001). Although the start dates varied, the general trend is that the mid-Holocene was a time associated with an influx of sediments and extensive beach and dune development. However, ongoing sea-level rise (progressively exacerbated by land subsidence in the Western Isles) coupled with reductions in the offshore sand supply has subsequently resulted in erosion of many Hebridean beaches and the frontal undercutting of the sand dune and machair systems that they support.

Events at Luskentyre–Corran Seilebost appear to have followed this general trend, albeit exacerbated by two local effects. The low-gradient offshore zone resulted in a substantial and easily accessible source of beach and dune sediments, and the shelter offered by Taransay resulted in an essentially benign wave environment conducive to beach development within what had become a drowned tidal inlet. As a result the inlet became the locus of deposition with beach development at its entrance. Features of coastal deposition commonly occur where wave refraction reduces the capacity of waves to convey sediment. The swash-aligned orientation and location of Corran Seilebost can be explained in this manner. Similarly waves from both north and west influencing Luskentyre might also be expected to produce the triangular foreland of Corran Raah, on the lee shore of Taransay. In spite of the shelter afforded by Taransay, the extent and height of the dune and machair surfaces on both sides of Tràigh Luskentyre is impressive and, in the context of the inlet as a whole,Ritchie and Mather (1970b) suggested that the unusually shaped and sited twin promontories might represent fragments of a much more extensive dune and machair system. This hypothesis suggests that the original beach and dune probably developed only slightly seawards of the present location but that the machair surface may have extended over much of what is now Tràigh Luskentyre. Remnants of this machair surface fringe parts of Tràigh Luskentyre some distance inland, for example at Crago and farther east (Figure 9.14). Submergence over the later Holocene subsequently resulted in erosion of the fronting beach and dune, fragmentation of the fronting system and the submergence of Tràigh Luskentyre. The original direction of wind-blow within the enlarged system may have had a substantial westerly bias but once fragmentation occurred, the northern part of the system may have become more influenced by southerlies that drove blowthrough corridors northwards, a process that continues today. In addition, the seaward edges of the Seilebost saltmarsh are undercut and have a very similar appearance to wet machair. Submergence may have resulted in the conversion of a low-lying machair to what was reported by Dargie (1998) as a saltmarsh community with excellent examples of transitional saltmarsh–machair communities at its landward margin. Coring of the intertidal flats and saltmarshes may help resolve some of the above uncertainties. The outcrop of calcarenite below low water at Luskentyre may suggest submergence and/or retreat, since the formation of such crusts may be related to deposition or re-deposition of calcium carbonate under fluctuating water tables.

In the above scenario, the ‘spit' of Corran Seilebost has not been formed by longshore drift from south–south-west, but by submergence of a more extensive dune-machair system and is not a true spit. In addition, the location of the estuarine channel will have influence on the extent and timing of erosion of both Corran Seilebost and Luskentyre.

Conclusions

Together the twin peninsulas of Luskentyre and Corran Seilebost represent a highly dynamic beach–dune–machair system that is one of the most scientifically interesting areas in the Western Isles. Not only do the sites contain the best examples in Harris of most of the features of machair landforms, but they have also formed in an unusual setting. It is possible that the present sites represent the remnants of a once more extensive beach–dune–machair system that has become fragmented by submergence. If this is the case, then the sites have added significance since they may form part of a suite of machair sites in the Western Isles that record, in the various stages of development of their landforms, a cycle of growth and decay that has affected machair over the Holocene Epoch.

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