Morrich More, Ross and Cromarty

[NH 803 835]–[NH 892 830]

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Introduction

The saltmarshes at Morrich More (see (Figure 10.1) for general location) have developed mainly within Inver Bay, protected by accretion of beaches to the north and west, but marshes also occur behind the two tidally connected islands in the north (see Chapter 11 for a description of the other coastal geomorphology features of interest). The marshes are the most extensive area of saltmarsh in the Highlands, and they form an integral part of a landform assemblage that has developed over the last 6500 years. The marsh sediments have an unusually high component of sand, and the marsh stratigraphy is layered — this feature is well displayed in the marsh edge along Inver Bay. The creek pattern over the saltmarsh is strongly linear and parallel. This distinctive pattern is largely confined to a few saltmarshes in Britain that are developing rapidly or are affected by isostatic uplift, as is particularly well demonstrated at Morrich More. The drainage dynamics of the saltmarsh at Morrich More exhibit an unusual drainage lag on the ebb tide, probably attributable to subsurface pipe networks (Leafe and Hansom, 1990). The saltmarsh has some fine examples of channel pans and primary pans. Together these attributes make Morrich More a key site for studies of saltmarsh geomorphology on an emerged coast.

Description

Pye and French (1993) describe Morrich More as including open coast, back-barrier and estuarine fringing marshes. The marsh edge morphology is variable from cuffed to ramped. The creek system is strongly linear, especially the younger parts, and saltpans are common (Hansom and Leafe, 1990; Leafe and Hansom, 1990). Extensive areas of intertidal sandflat have developed in the shelter provided by the barrier beaches of Innis Mhór and Patterson Island. Similar areas exist on the western flank of Morrich More and within Inver Bay. On the more elevated sections of sandflat, tidal inundation is of lower frequency and duration, thus allowing saltmarsh vegetation to colonize. The 260 ha of saltmarsh on Morrich More represents 5% of the remaining semi-natural saltmarsh in Scotland and 17% of that in the Highland Region, yet it is a distinctive system in its own right on account of the sandy nature of the substrate and its context of rapid isostatic uplift (Hansom and Leafe, 1990).

The saltmarshes are drained by creek systems that extend into the Morrich along the axes of the inter-ridge swales or hollows. Thus, salt-marsh and emerged beach ridges interdigitate, and as the saltmarsh grows and accretes through time, the extremities of the beach ridges become progressively buried. Owing to isostatic uplift over 6500 years, the altitude over the Morrich More falls seawards to the west, north and east, and so saltmarshes have developed at the edges of a domed structure, with the oldest marshes close to the centre and the youngest in the west, north and east. The complex vegetation pattern of the Morrich More is dominated by this pattern of interdigitated ridges and slacks (Smith and Mather, 1973). The strandplain carries a rich flora of over 200 flowering species, ranging from intertidal sandflat species to *Juniperus–Calluna* heath on the oldest landward ridges. The vegetation succession of the Morrich More is discussed in further detail in Smith and Mather (1973) and Dargie (1989).

As part of an assemblage of coastal features, further description of the site is given in Chapter 11 of the present volume.

Interpretation

Relative sea-level change in the Dornoch Firth area is dose to 0 mm a^{-1} (Pye and French, 1993) and the marsh is characterized by vertical accretion, but variable lateral erosion and accretion; accretion is relatively rapid in the back barrier area between the islands and the main Morrich More coastline. The size and relatively undisturbed history of 6500

years of continuous sedimentation of Morrich More has led to the presence of a full range of successional stages of embryo dune through to sand plain in association with dune slacks and interfingered salt-marsh. Dargie (1989) demonstrates the importance of the vegetational transitions at Morrich More, with those between the saltmarsh and dune systems being of particular complexity and therefore of high conservation value in view of the clear relationship with geomorphology. Vegetational transitions from saltmarsh to sand dune are extremely rare in Britain, and the transition on Morrich More from saltmarsh to calcareous dune, wet acid dune or dry dune grassland makes the upper saltmarsh vegetation, and its interaction with the domed geomorphology of the strandplain, uniquely important.

Conclusions

The scientific interest of Morrich More is outstanding both in terms of variety and scale of its coastal landforms including the strandplain, parabolic dunes, stabilized dunes, foredune succession, saltmarshes and sandflats. The saltmarshes are uniquely youthful to the west, north and east, away from the emerged surfaces of central Morrich. The site shows a well-developed vegetational transition from intertidal sandflat through saltmarsh to freshwater wetland and calcareous dome.

(Figure 10.1) The generalized distribution of active saltmarshes in Great Britain. Key to GCR sites described in the present chapter or Chapter 11 (coastal assemblage GCR sites): 1. Morrich More; 2. Culbin; 3. North Norfolk Coast; 4. St Osyth Marsh; 5. Dengie Marsh; 6. Keyhaven Marsh, Hurst Castle; 7. Burly Inlet, Carmarthen Bay; 8. Solway Firth, North and South shores; 9. Solway Firth, Cree Estuary; 10. Loch Gruinart, Islay, 11. Holy Island. (After Pye and French, 1993.)