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Dynamic Coast – Scotland's National Coastal Change Assessment

Site Summary

Dornoch Point & Sands (Site 39)

Disclaimer

The evidence presented within the National Coastal Change Assessment (NCCA) must not be used for property level of scale investigations. Given the precision of the underlying data (including house location and roads etc.) the NCCA cannot be used to infer precise extents or timings of future erosion.

The likelihood of erosion occurring is difficult to predict given the probabilistic nature of storm events and their impact. The average erosion rates used in NCCA contain very slow periods of limited change followed by large adjustments during storms. Together with other local uncertainties, not captured by the national level data used in NCCA, detailed local assessments are unreliable unless supported by supplementary detailed investigations.

The NCCA has used broad patterns to infer indicative regional and national level assessments to inform policy and guide follow-up investigations. Use of these data beyond national or regional levels is not advised and the Scottish Government cannot be held responsible for misuse of the data.

Dornoch Point and Sands (Site 39)

Historic Change: The beaches at Dornoch can be subdivided into three sections: North beach towards Embo Pier, Middle beach (north east of the town) and South beach (towards the point). Dornoch Sands extend westwards from the point towards the A9 road bridge.

Much of North beach has remained stable between 1905 and 1980. However, a 280m section of beach did retreat between 20 or 30 m (up to 0.3 m/yr) during this period (Figure 3.1). Middle beach was also stable with insignificant changes up to 1977. The bulk of the changes have occurred on South beach where the shoreline has advanced seawards up to 100m between 1905 and 1980 (1.4 m/yr). Parallel dune ridges and hollows lie where the beach was in 1905. The southern tip of Dornoch Point has been clipped back almost 100m in 75 years, and has moved westwards with a 1905 spit extending some 400m to the west. These active dunes enclose 38ha of salt marsh that has accumulated in the intervening 75 years, with remarkable seaward advances of MHWS (above 400m). Within Dornoch Sands, much of the coast is stable with only a small section of minor erosion fronting the Struie golf course.

Once again, the modern OS MHWS has seen little update, with only minor revisions at the northern end of South beach. The analysis here therefore relies on the 2011 Scottish Government LiDAR survey. North beach has seen accretion within the vicinity of the earlier losses, largely negating them. Middle beach has advanced up to 30m between 1977 and 2011 (0.9 m/yr), and the accretion at South beach has accelerated. Here since 1979, MHWS has advanced seawards up to 220 m (6.8 m/yr). The advances, like the earlier period, are curtailed towards the Point where erosion dominates on the easterly facing edge. Since 1979 Dornoch Point continued to move south up to 250 m, occupying its most southerly position yet. Further accretion occurred within the enclosed spit, however much of the 1.5 km of shore remained largely stable since 1979. The notable exception to this is a small area of erosion abutting the Struie golf course that is now the subject of a proposed rehabilitation project. Recent erosion has also occurred on adjacent farm land, however the remainder of the bay to the west is largely stable.

Figure 3.1: MHWS position in 1890, 1970s, and Modern datasets at Dornoch Point. Getmapping are our current providers of Scotland-wide digital aerial imagery© Getmapping plc.

Dornoch Sands lies within part of the Dornoch Potentially Vulnerable Area and contributes towards the Dornoch Firth and Loch Fleet Special Protection Area and Morrich More Site of Special Scientific Interest.

Future Vulnerability: The future shorelines on North, Middle and South beach at Dornoch are expected to be stable or accretional in the future. Dornoch Point is expected to continue to broaden and move westwards, as it has done over the last 111 years (Figure 3.2). Further west however, the historical retreat rates have been projected landwards and erosion is anticipated within the Struie golf course and farmland 1km to the west. Apart from the farmland there are few built assets in this area, although there are two houses which are about 60m from the 2100 MHWS line. The nature conservation designated sites are unlikely to be negatively impacted by the erosion.

Figure 3.2: Possible future coastline position in 2050 based on rates between 1970 and Modern MHWS data at Dornoch Point. Getmapping are our current providers of Scotland-wide digital aerial imagery© Getmapping plc.

References

This is an extract from:

Fitton, J.M., Rennie, A.F., and Hansom, J.D. (2017) Dynamic Coast - National Coastal Change Assessment: Cell 2 - Fife Ness to Cairnbulg Point, CRW2014/2.

The full version of this report and others are available at:

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