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Dynamic Coast – Scotland's National Coastal Change Assessment

Site Summary

Whiteness (Site 34)











S C A P E









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.

Whiteness Head (Site 34)

Historic Change: Whiteness Head lies 5km to the west of Nairn. In 1903, it was composed of a 2.6 km long spit extending northwest from the Carse of Delnies, which enclosed an area of sand flat and salt marsh (Figure 3.1). By 1976, the spit had extended a further 1.2km (16 m/yr) enclosing a tidal channel which along with the surrounding area, was developed into an oilrig fabrication yard in the early 1970s (Hansom, 2003). Substantial volumes of sediment were dredged to deepen the shallow tidal channel which was reused to claim an extensive area of land for the yard. The eastern end of the spit experienced up to 60 m of erosion over this period (0.9 m/yr) which was carried westwards extending the spit towards the northwest. Following creation of the yard, substantial volumes of sediments have been removed from the tip of the spit and deposited within the dunes to the south of the navigation channel. These gains have been substantial and long-lived. Maintenance dredging continued until the yard closed in 2001. This has resulted in the spit being held in largely the same position as it was in the 1970s. In contrast, the dredged sediments were deposited south of the channel with resultant gains on the coast adjacent to White Ness Sands.

Along its entire length, the north-eastern facing coast of Whiteness Head has retreated between 25 and 40 m between 1976 and 2011 (up to 1.1 m/yr) (Figure 3.2). Following the closure of the yard, dredging ceased and the sediments accumulated at the tip of the spit once again. The orientation of growth was now to the west and south west, as the spit was entering deeper water than before. This orientation change has forced the tidal channel southwards which has eroded up to 120 m of dunes. Air photography confirms the infilling of subtidal sediment within the former dredged channel which now spills sediments into the former harbour (to the east) but also southwards on to Whiteness Head Sands. Whilst some of the adjacent dunes have seen up to 48 m of erosion between 1976 and 2011, a southerly spit has formed extending some 200 m in the intervening 35 years (5.6 m/yr). Separate studies have estimated the sediment supply passing around the point at Whiteness Head in the order of 160,000m³/yr.

Whiteness Head falls within Nairn West and Ardersier Potentially Vulnerable Area and contributes to the Inner Moray Firth Special Protection Area and Whiteness Head Site of Special Scientific Interest.



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

Future Vulnerability: The vulnerability assessment projects the past erosion rate into the future to 2050 and 2100 and considers which assets may be affected. The dominance of erosion along the majority of the east-facing coast since 1976 is readily verified on the ground with over-wash sediments evident along the spit. A narrow area within the western third of the spit (intentionally dredged to allow rigs to turn in the channel) was partially breached during winter storms in 2014. Erosion is expected to continue between the Carse of Delnies and all but the tip of the spit (Figure 3.2). Given the narrow character of the spit in 2011 (often 25-50 m wide, but has already reduced to less than 15m in places, there is ample evidence for further narrowing and reworking of sediments over the spit (southwards). Such changes should be entirely expected and borne in mind with respect of future development proposals on this brown-field site. Currently the site has planning permissions for both a new town development (postponed after 2006) and a renewables fabrication yard, which has yet to advance due to the Port of Ardersier going into administration. The past, recent and anticipated changes do not present a risk or threat to the nature conservation designation interest of the site.



Figure 3.2: Possible future coastline position in 2050 based on rates between 1970 and Modern MHWS data Whiteness Head. 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.

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