

Fig 1 Location of study areas



Fig 2.1 Prehistoric and Roman HER/NMR findspots, monuments and archaeological sites between Mablethorpe and Skegness



Fig 2.2 Prehistoric and Roman HER/NMR findspots, monuments and archaeological sites between Mablethorpe and Skegness



Fig 2.3 Prehistoric and Roman HER/NMR findspots, monuments and archaeological sites between Mablethorpe and Skegness



Fig 2.4 Prehistoric and Roman HER/NMR findspots, monuments and archaeological sites between Mablethorpe and Skegness



Fig 2.5 Prehistoric and Roman HER/NMR findspots, monuments and archaeological sites between Mablethorpe and Skegness



Fig 2.6 Prehistoric and Roman HER/NMR findspots, monuments and archaeological sites between Mablethorpe and Skegness



Fig 2.7 Prehistoric and Roman HER/NMR findspots, monuments and archaeological sites between Mablethorpe and Skegness



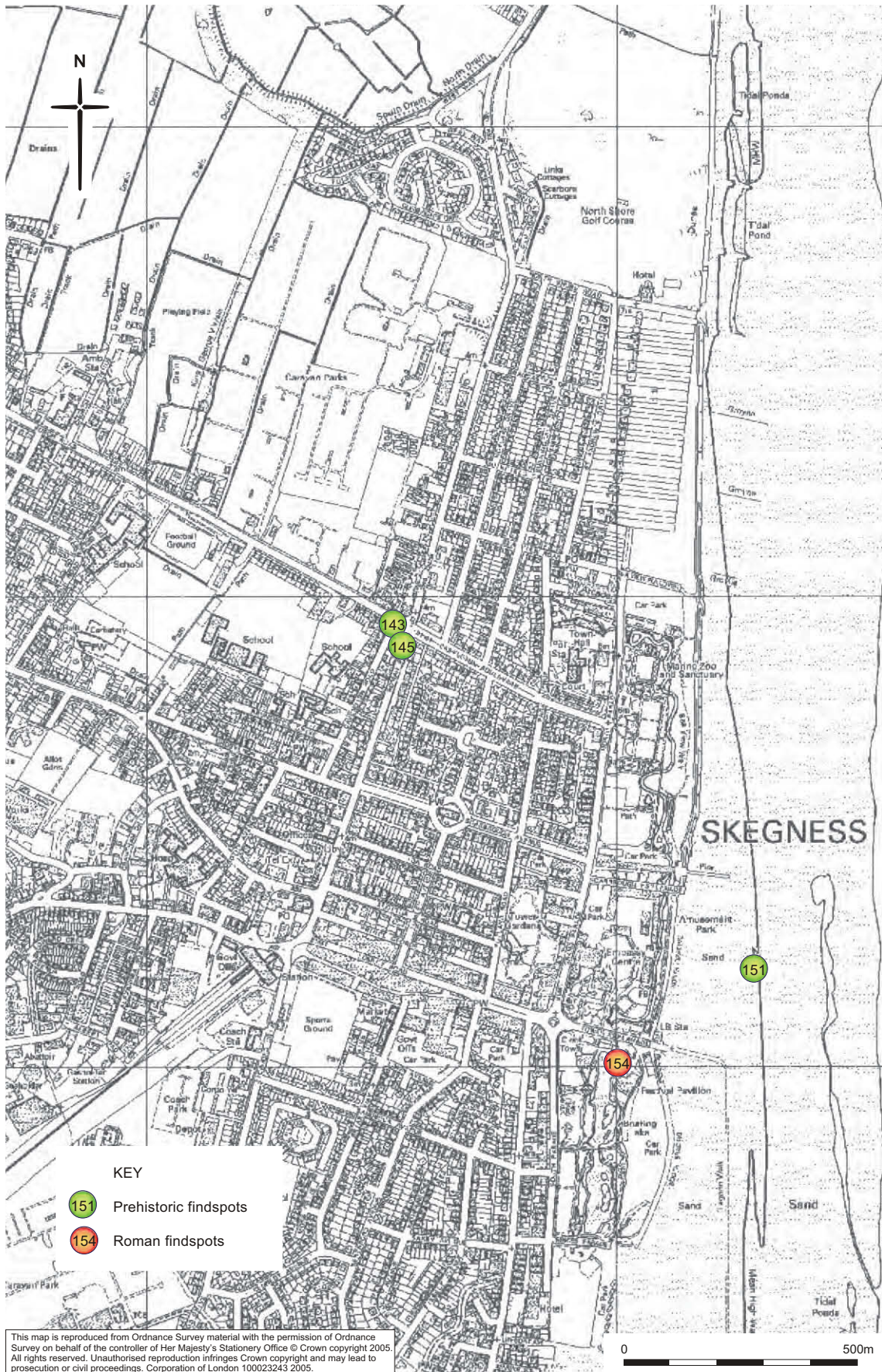


Fig 2.8 Prehistoric and Roman HER/NMR findspots, monuments and archaeological sites between Mablethorpe and Skegness



Fig 3.1 Medieval and post-medieval HER/NMR findspots, wreck sites and conservation areas between Mablethorpe and Skegness



Fig 3.2 Medieval and post-medieval HER/NMR findspots, wreck sites and conservation areas between Mablethorpe and Skegness



Fig 3.3 Prehistoric and Roman HER/NMR findspots, monuments and archaeological sites between Mablethorpe and Skegness



Fig 3.4 Medieval and post-medieval HER/NMR findspots, wreck sites and conservation areas between Mablethorpe and Skegness

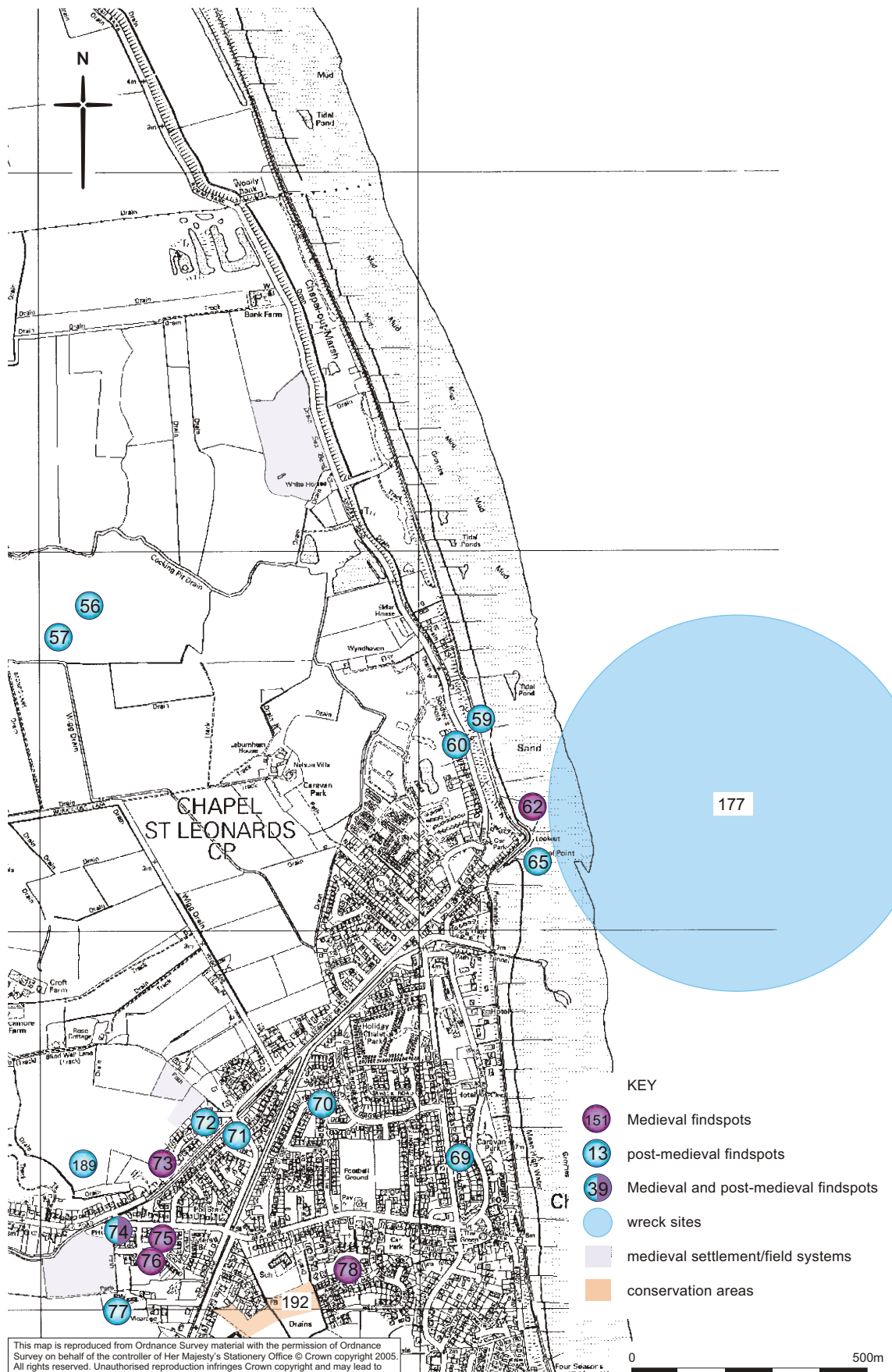


Fig 3.5 Medieval and post-medieval HER/NMR findspots, wreck sites and conservation areas between Mablethorpe and Skegness

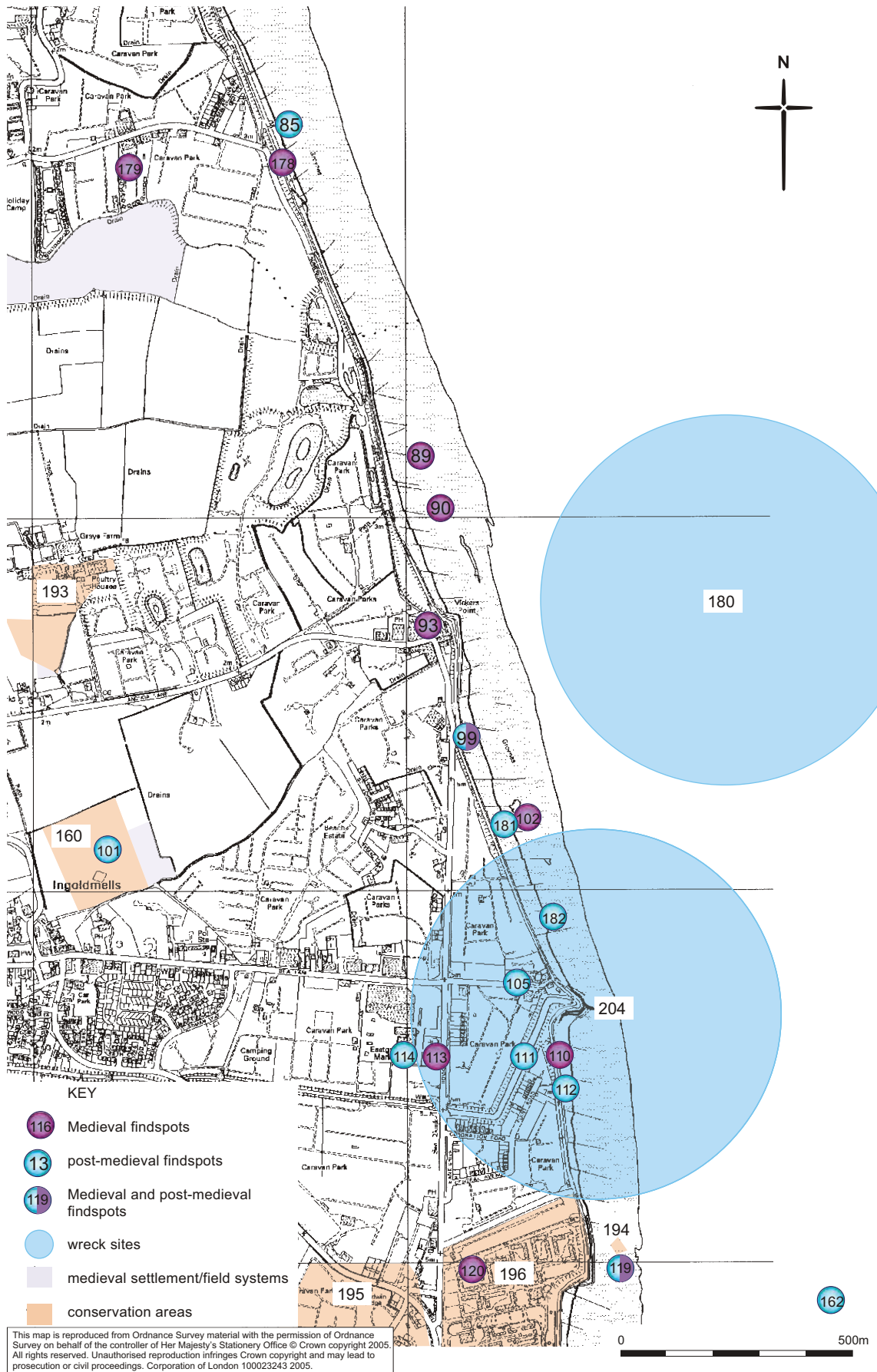


Fig 3.6 Medieval and post-medieval HER/NMR findspots, wreck sites and conservation areas between Mablethorpe and Skegness



Fig 3.7 Medieval and post-medieval HER/NMR findspots, wreck sites and conservation areas between Mablethorpe and Skegness





Fig 3.8 Prehistoric and Roman HER/NMR findspots, monuments and archaeological sites between Mablethorpe and Skegness

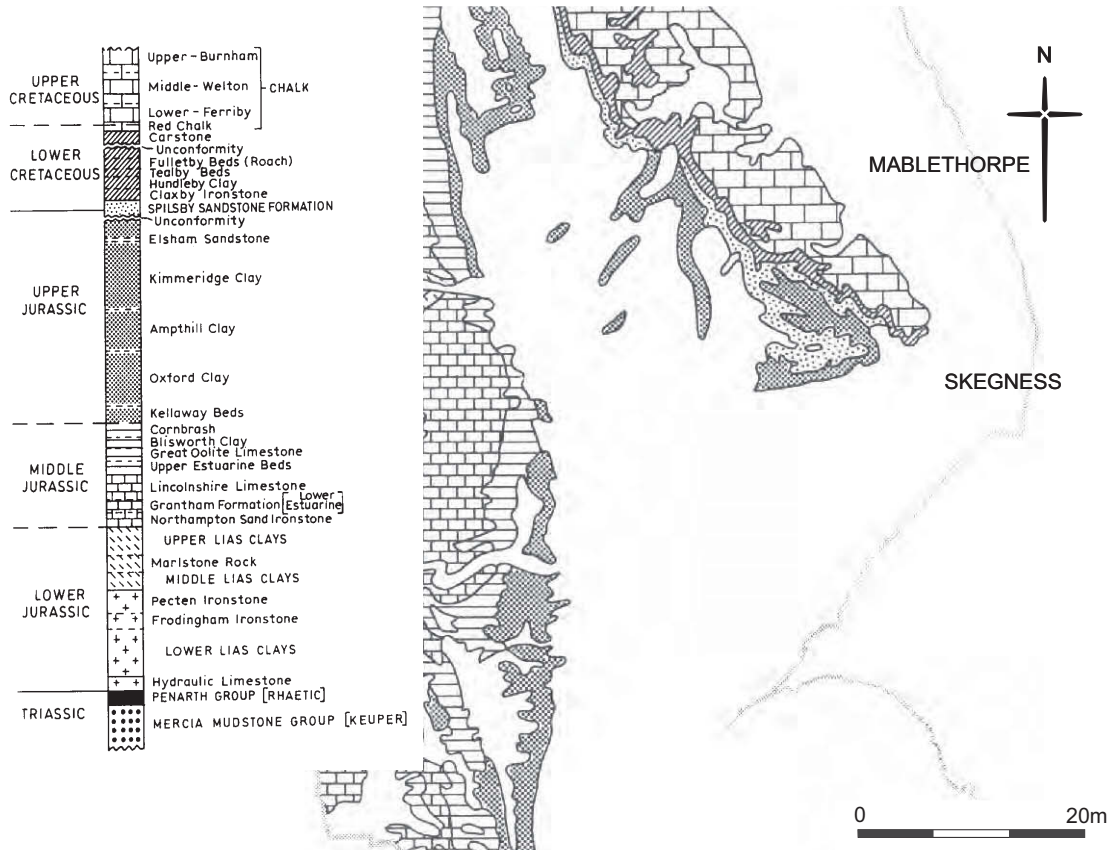


Fig 4 Solid geology of Lincolnshire (after Bennet and Bennet 1993)

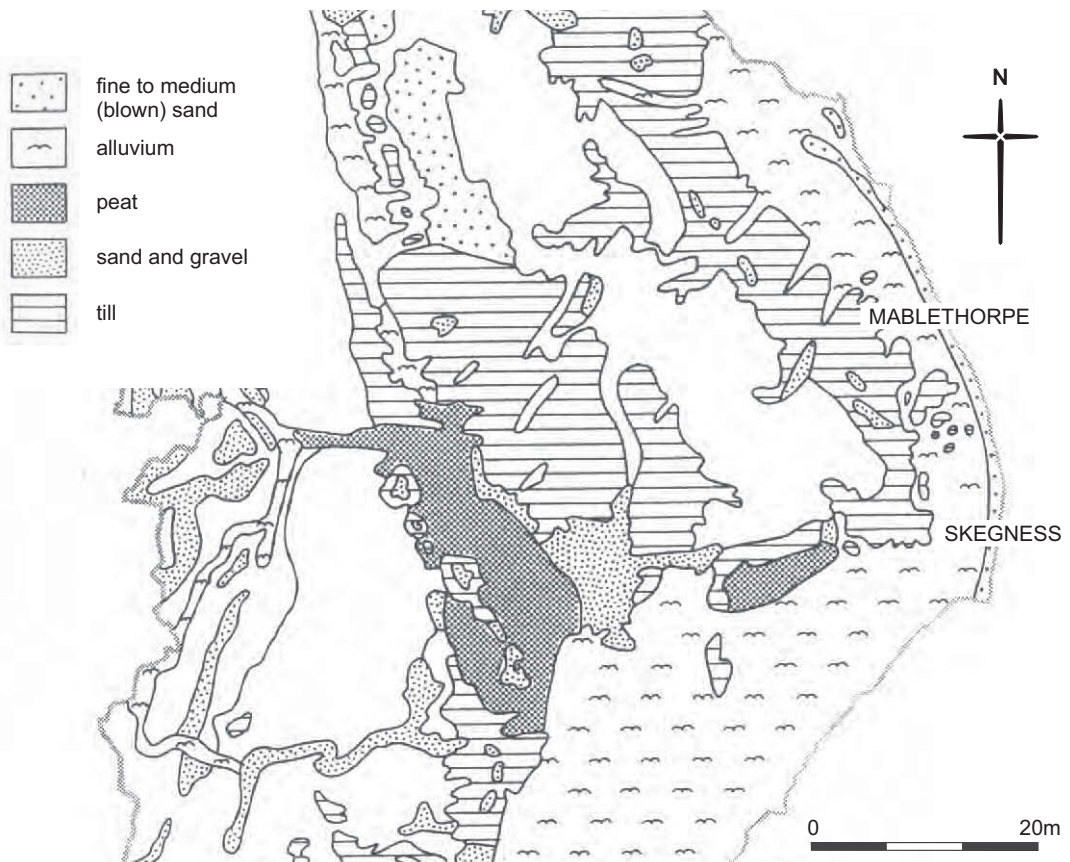


Fig 5 Drift geology of Lincolnshire (after Bennet and Bennet 1993)

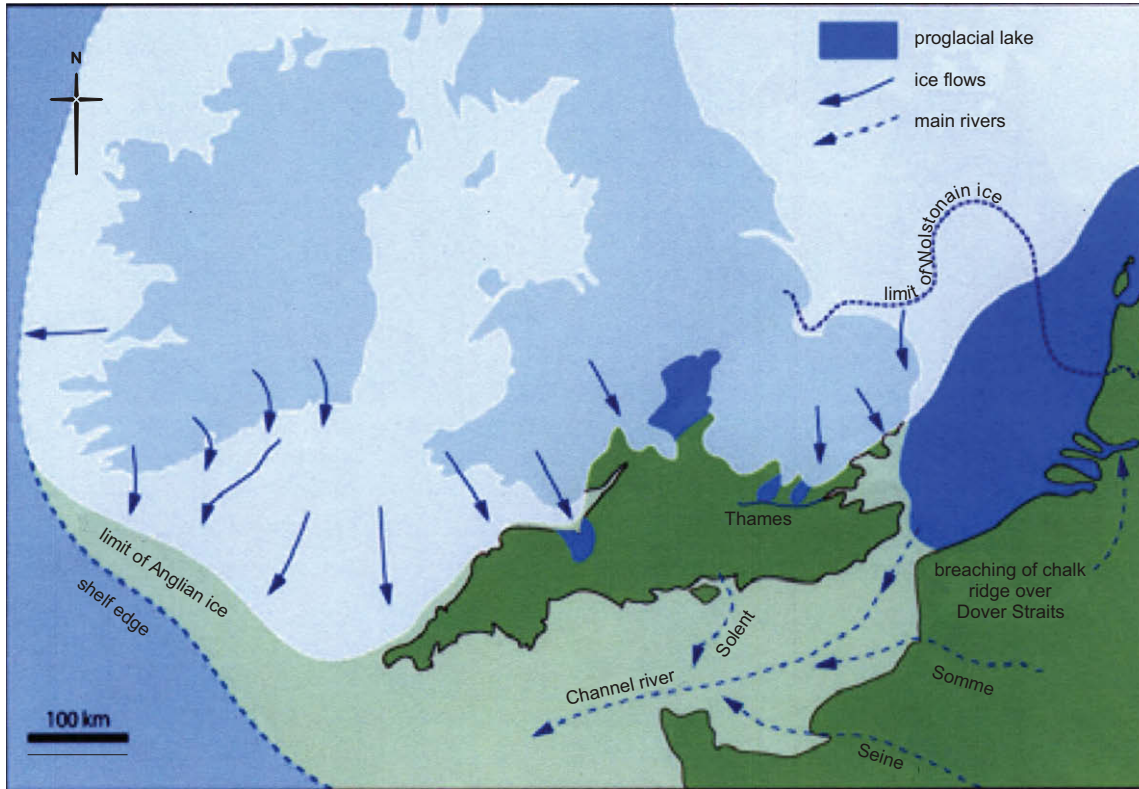


Fig 6 Extent of Anglian and Wolstonian ice sheets (based on Gibbard 1998, after Flemming 2002)



Fig 7 Extent of Devensian ice sheets (after Woodcock and Strachan 200)

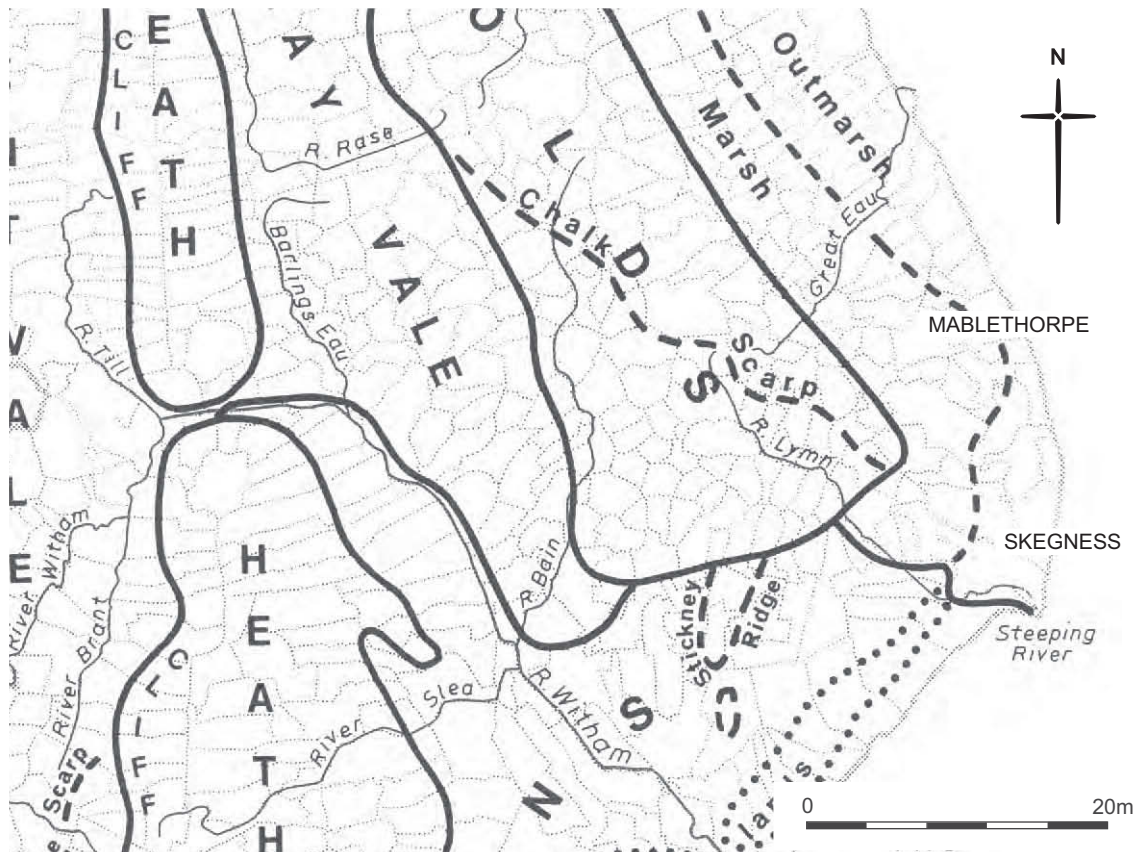


Fig 8 Topographic map of Lincolnshire (after Bennet and Bennet 1993)

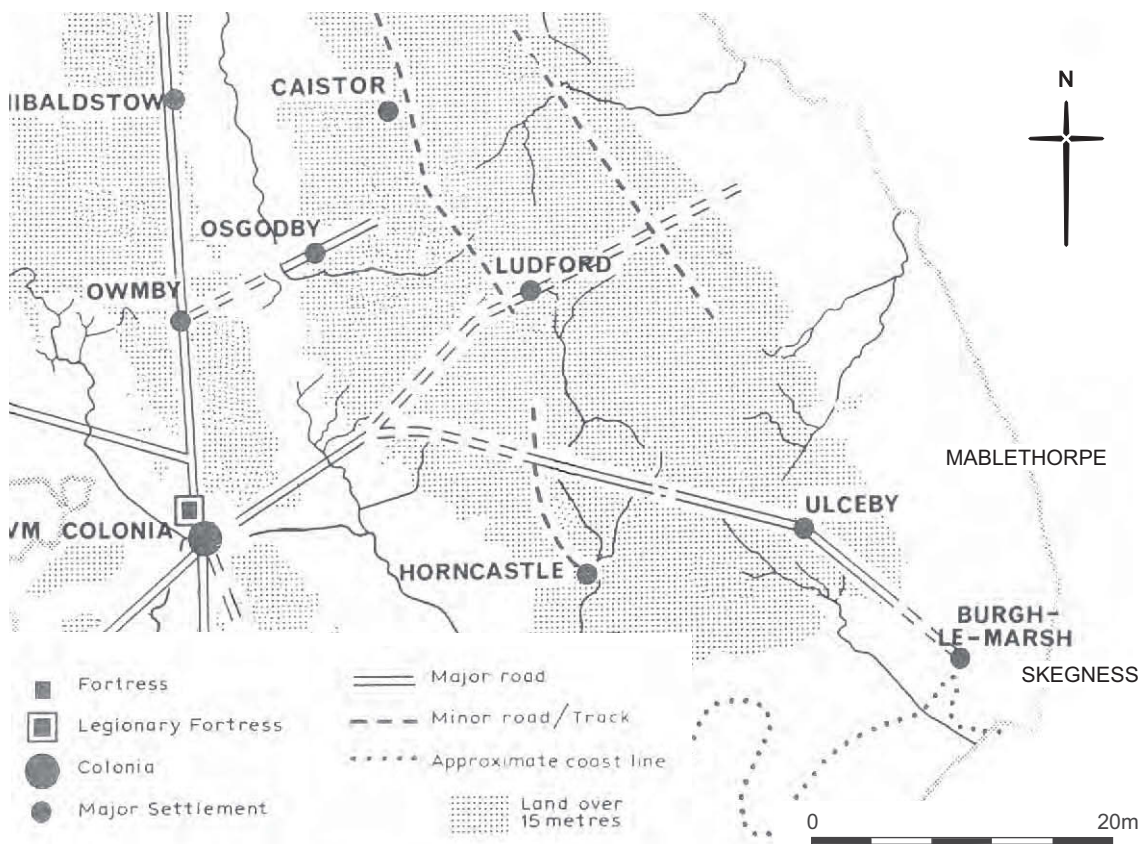


Fig 9 Roman road network in Lincolnshire (after Bennet and Bennet 1993)



Fig 10 Medieval districts in Lincolnshire (after Bennet and Bennet 1993)

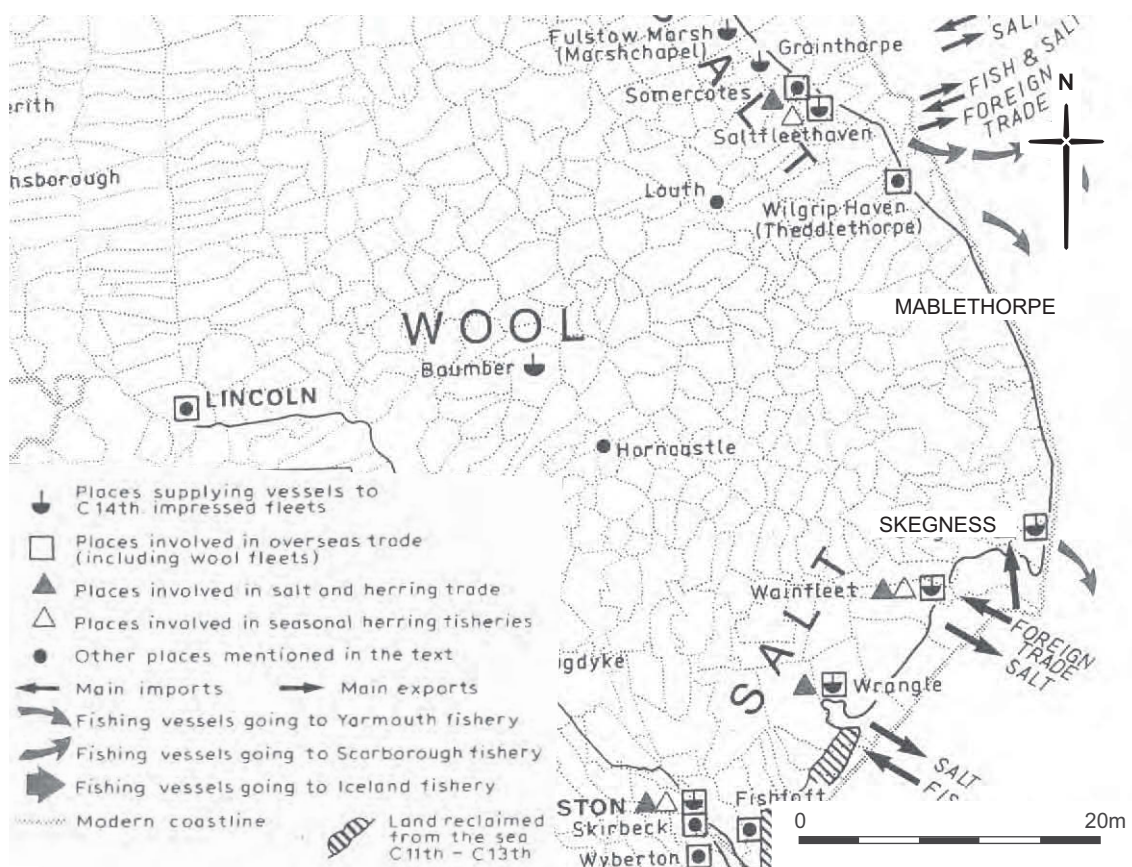


Fig 11 Medieval trade and fishing (after Bennet and Bennet 1993)

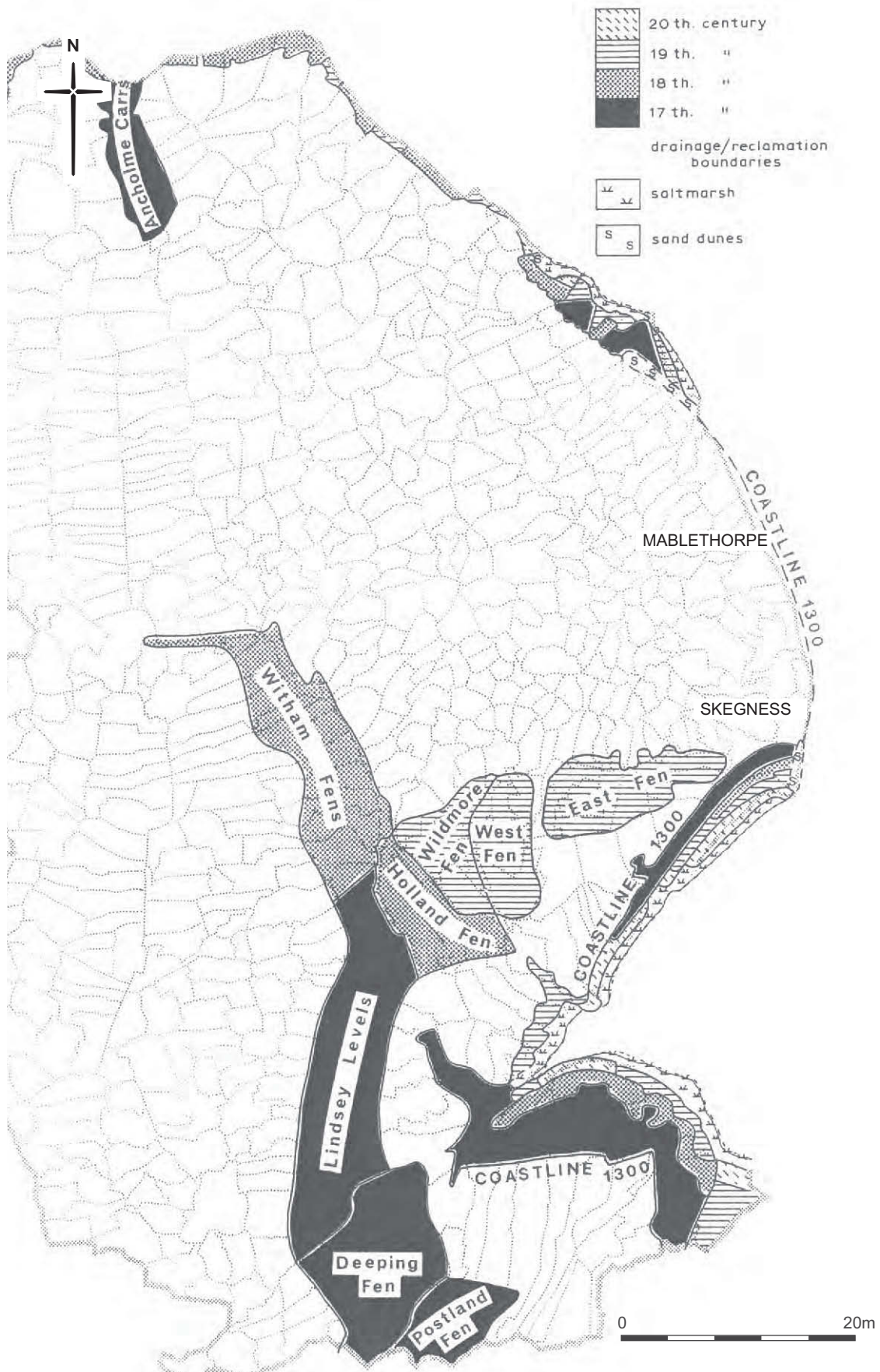


Fig 12 Post-medieval drainage and land reclamation (after Bennet and Bennet 1993)



Fig 13 Map of Lincolnshire coastline, 1778, Mablethorpe to Ingoldmells





Fig 14 Bryants map of Lincolnshire, 18th century, Mablethorpe to Ingoldmells

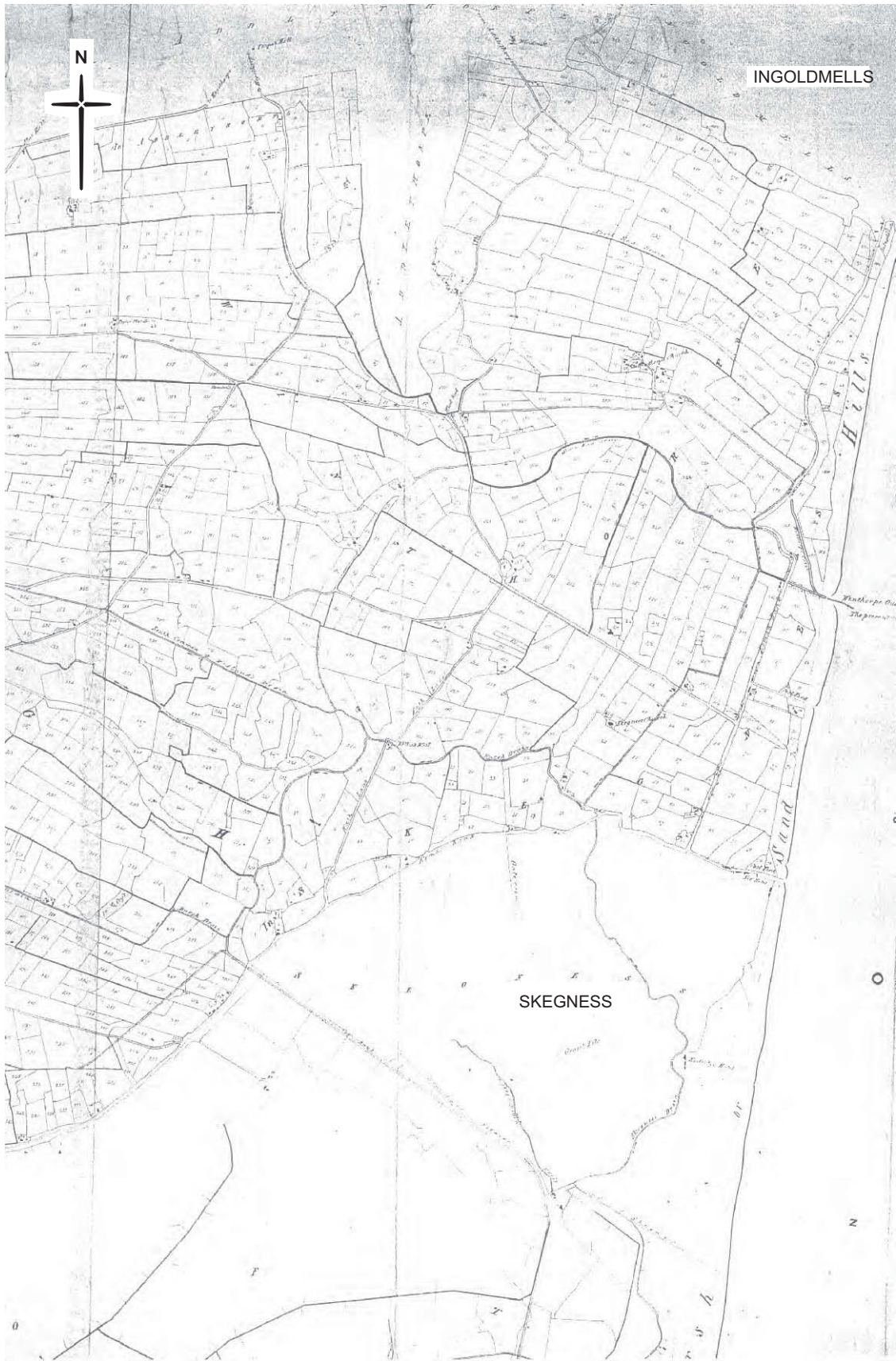


Fig 15 Map of Lincolnshire coastline, 1831, Ingoldmells to Skegness

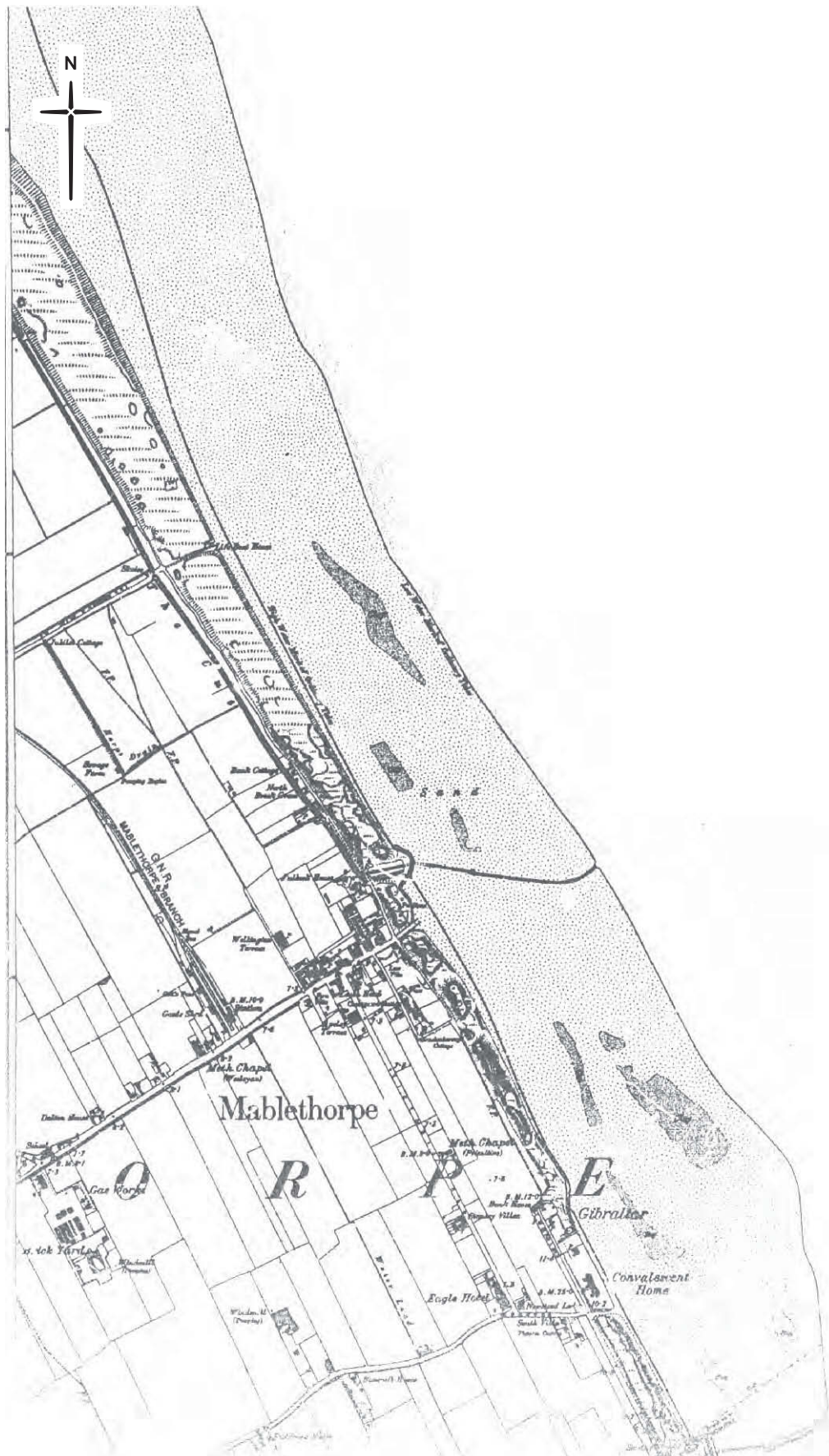


Fig 16.1 OS map Lincolnshire 6", 1st Ed 1888, showing coastline, sheets 1-8

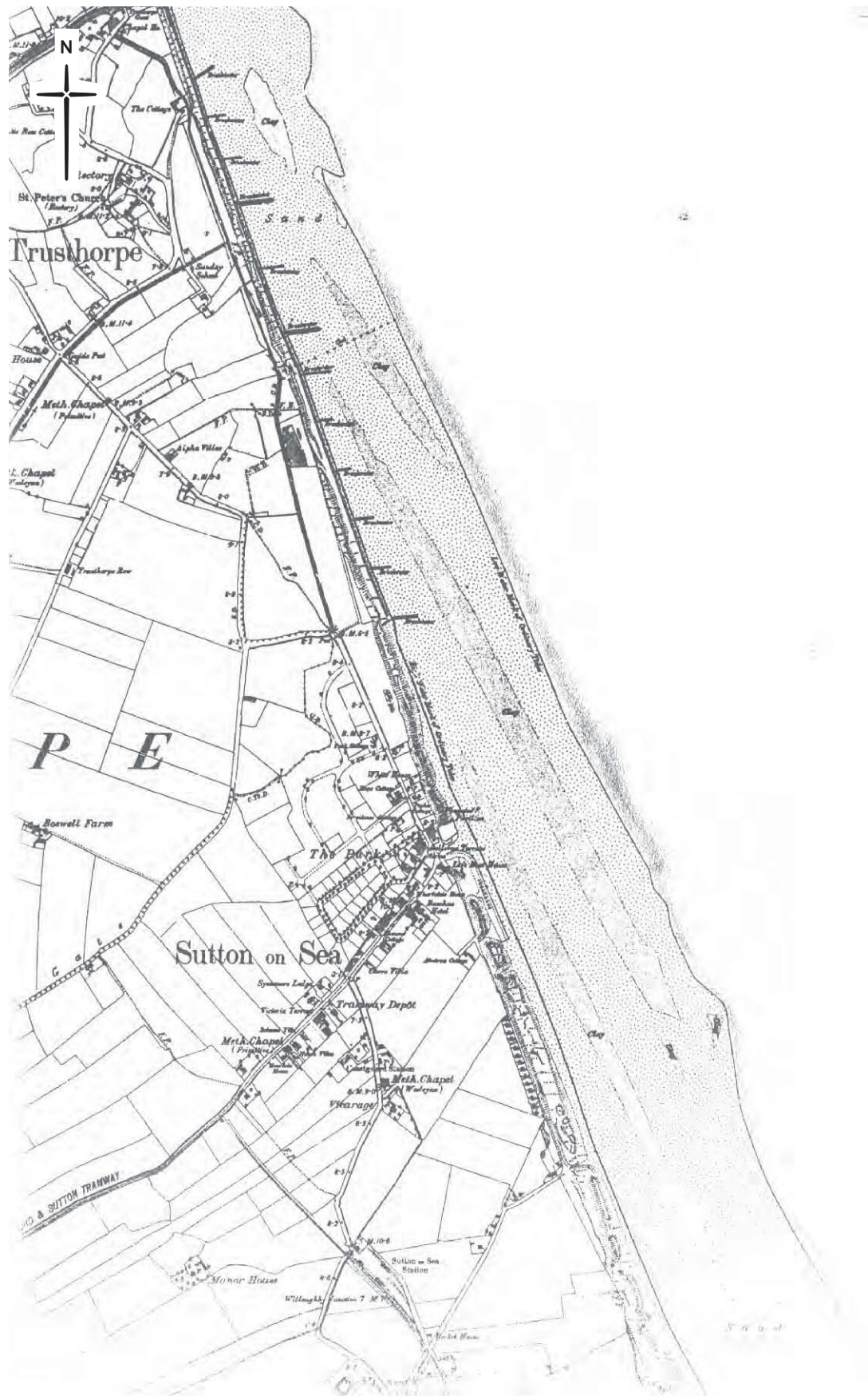


Fig 16.2 OS map Lincolnshire 6", 1st Ed 1888, showing coastline, sheets 1-8



Fig 16.3 OS map Lincolnshire 6", 1st Ed 1888, showing coastline, sheets 1-8

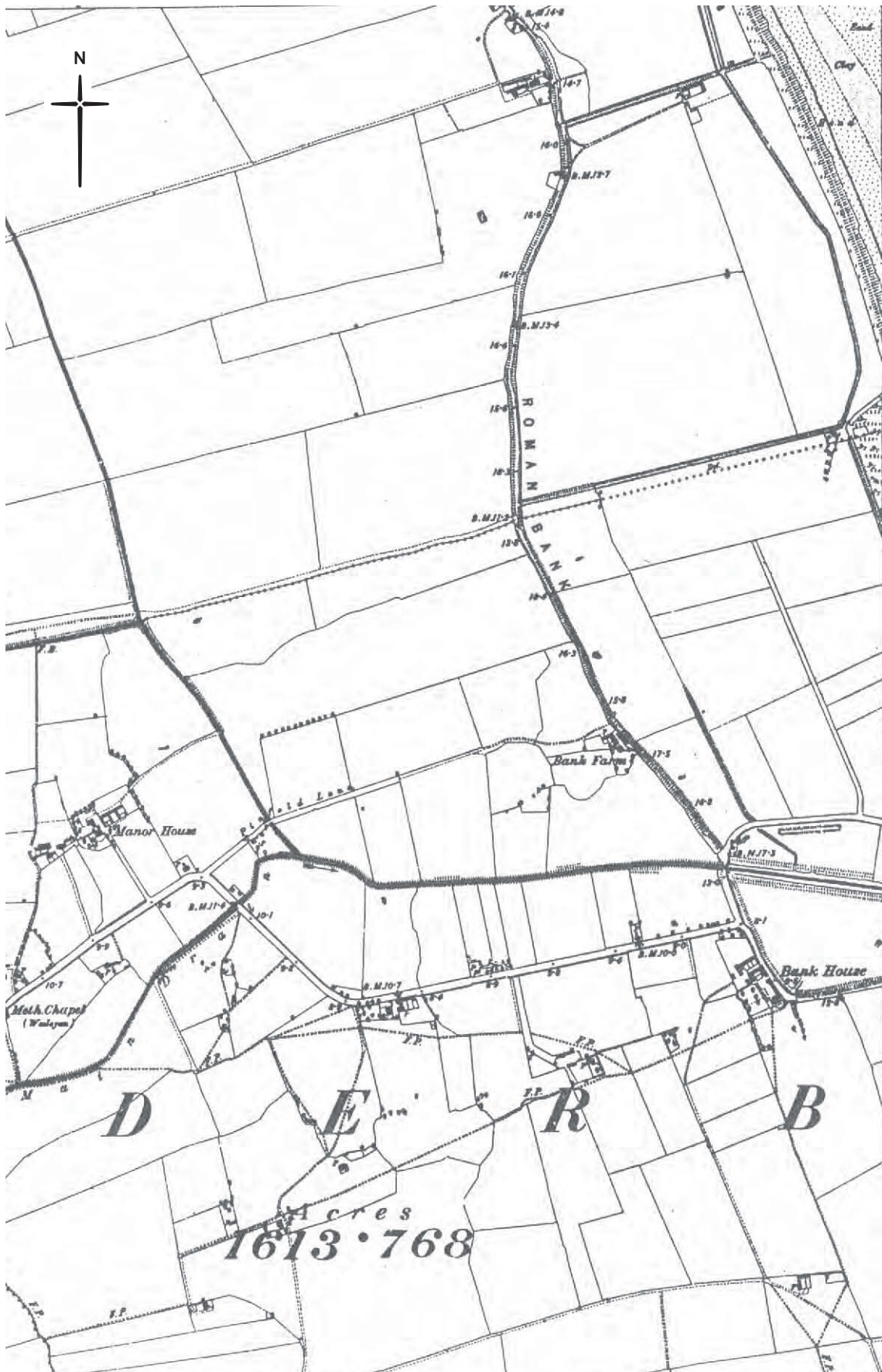


Fig 16.4 OS map Lincolnshire 6", 1st Ed 1888, showing coastline, sheets 1-8

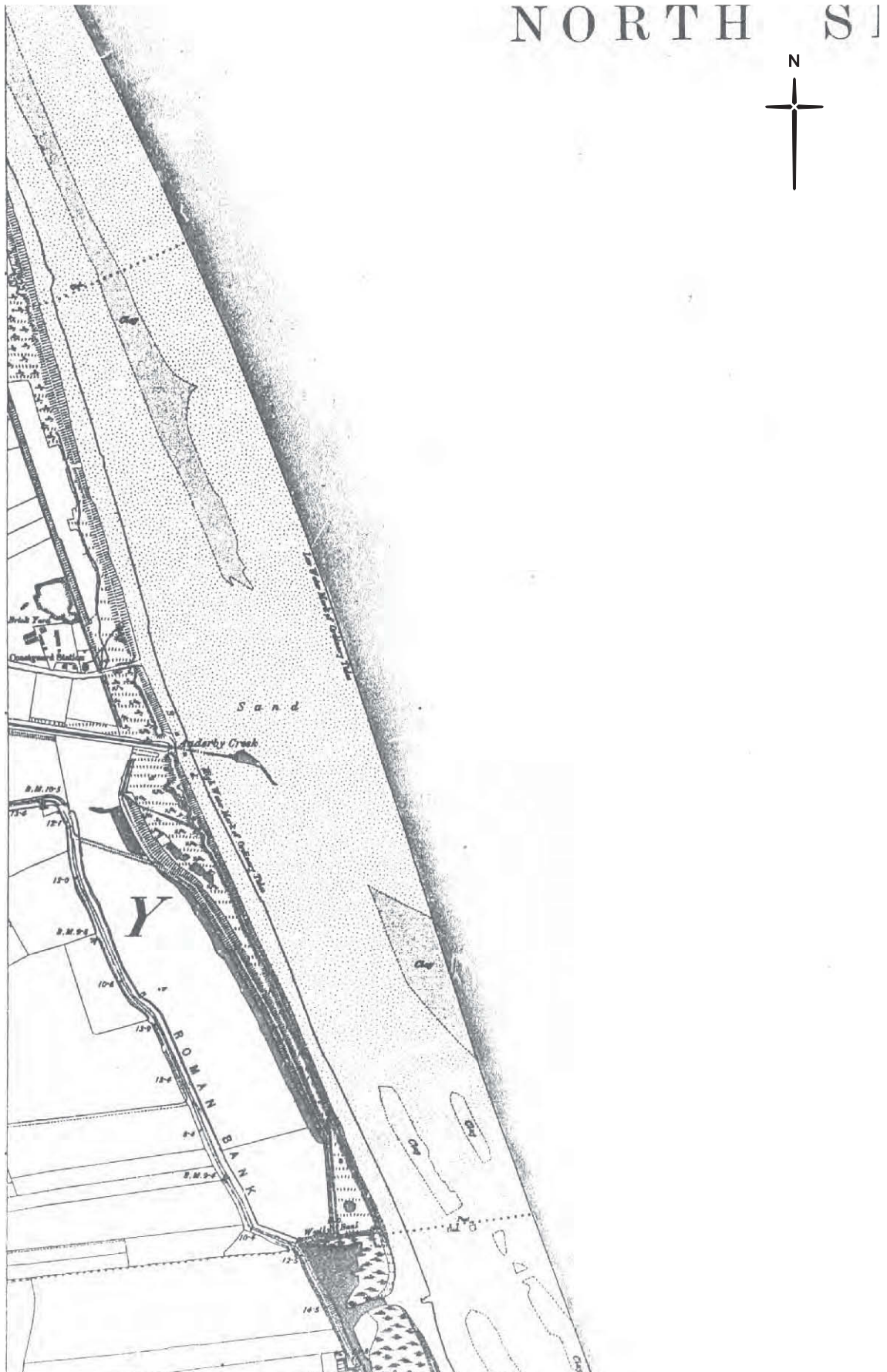


Fig 16.5 OS map Lincolnshire 6", 1st Ed 1888, showing coastline, sheets 1-8



Fig 16.6 OS map Lincolnshire 6", 1st Ed 1888, showing coastline, sheets 1-8





Fig 16.7 OS map Lincolnshire 6", 1st Ed 1888, showing coastline, sheets 1-8



Fig 16.8 OS map Lincolnshire 6", 1st Ed 1888, showing coastline, sheets 1-8



Fig 17.1 OS map Lincolnshire 25'', 2nd Ed 1906, showing coastline, sheets 1-12



Fig 17.2 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12



Fig 17.3 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12



Fig 17.4 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12



Fig 17.5 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12



Fig 17.6 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12





Fig 17.7 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12

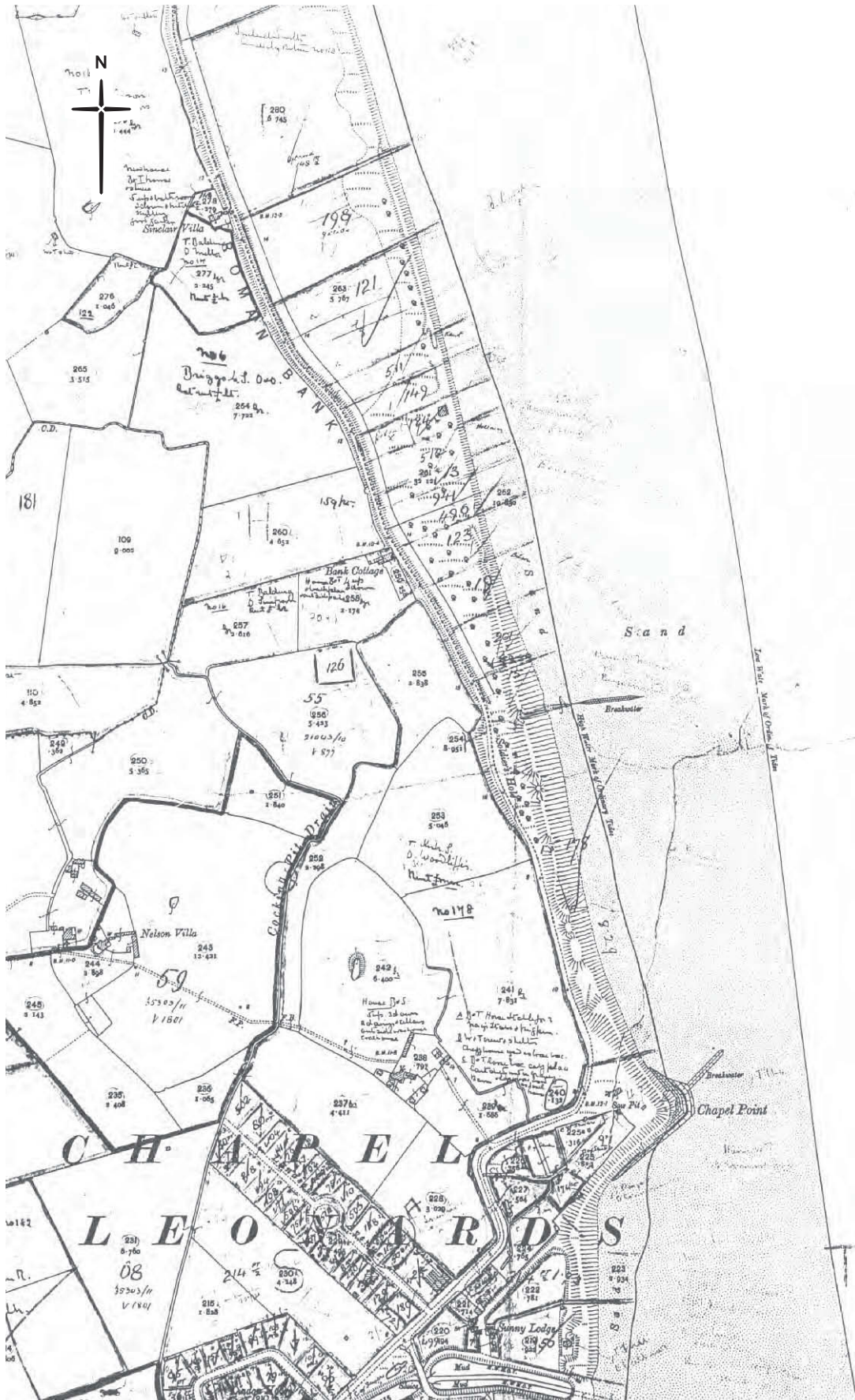


Fig 17.8 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12

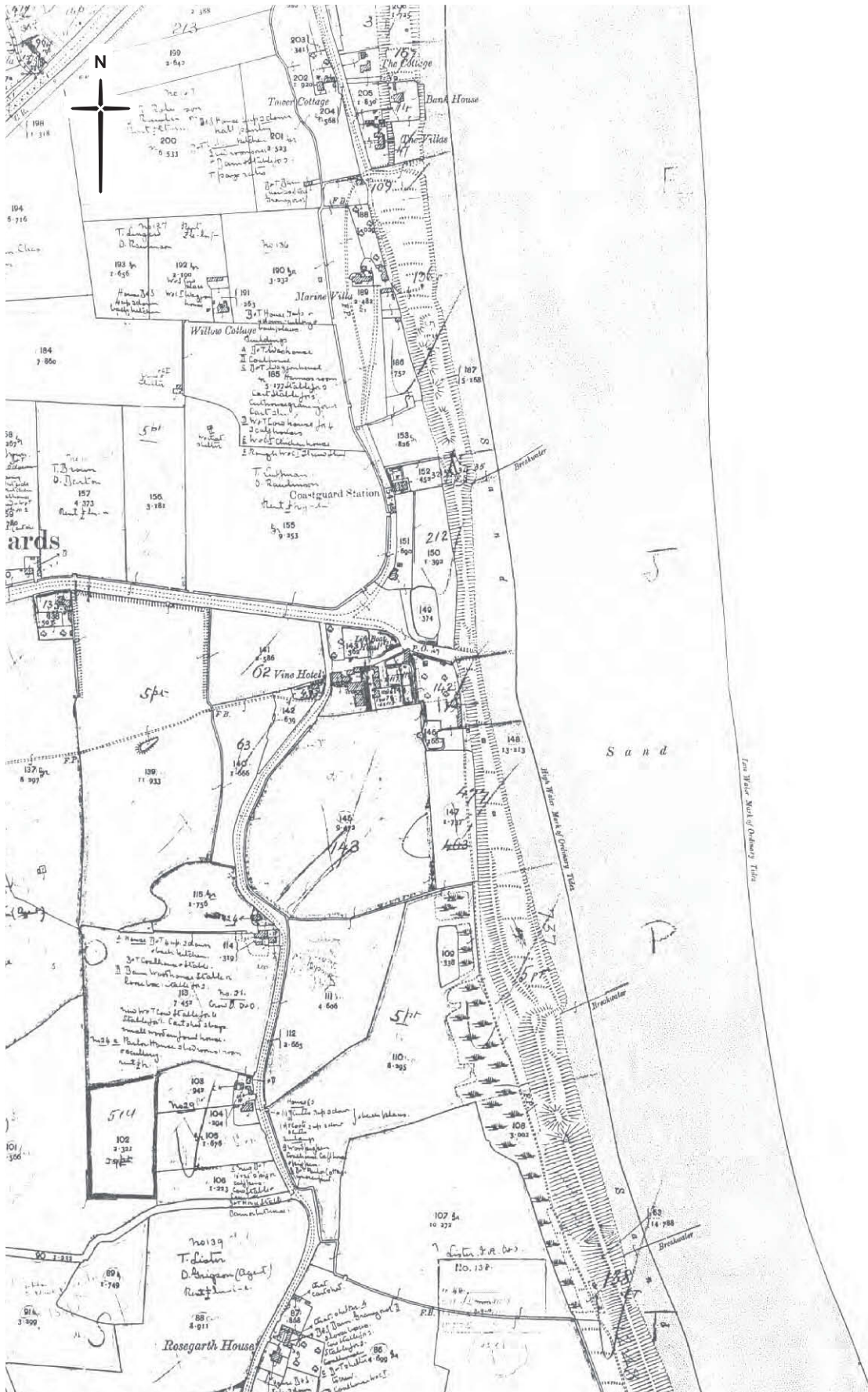


Fig 17.9 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12

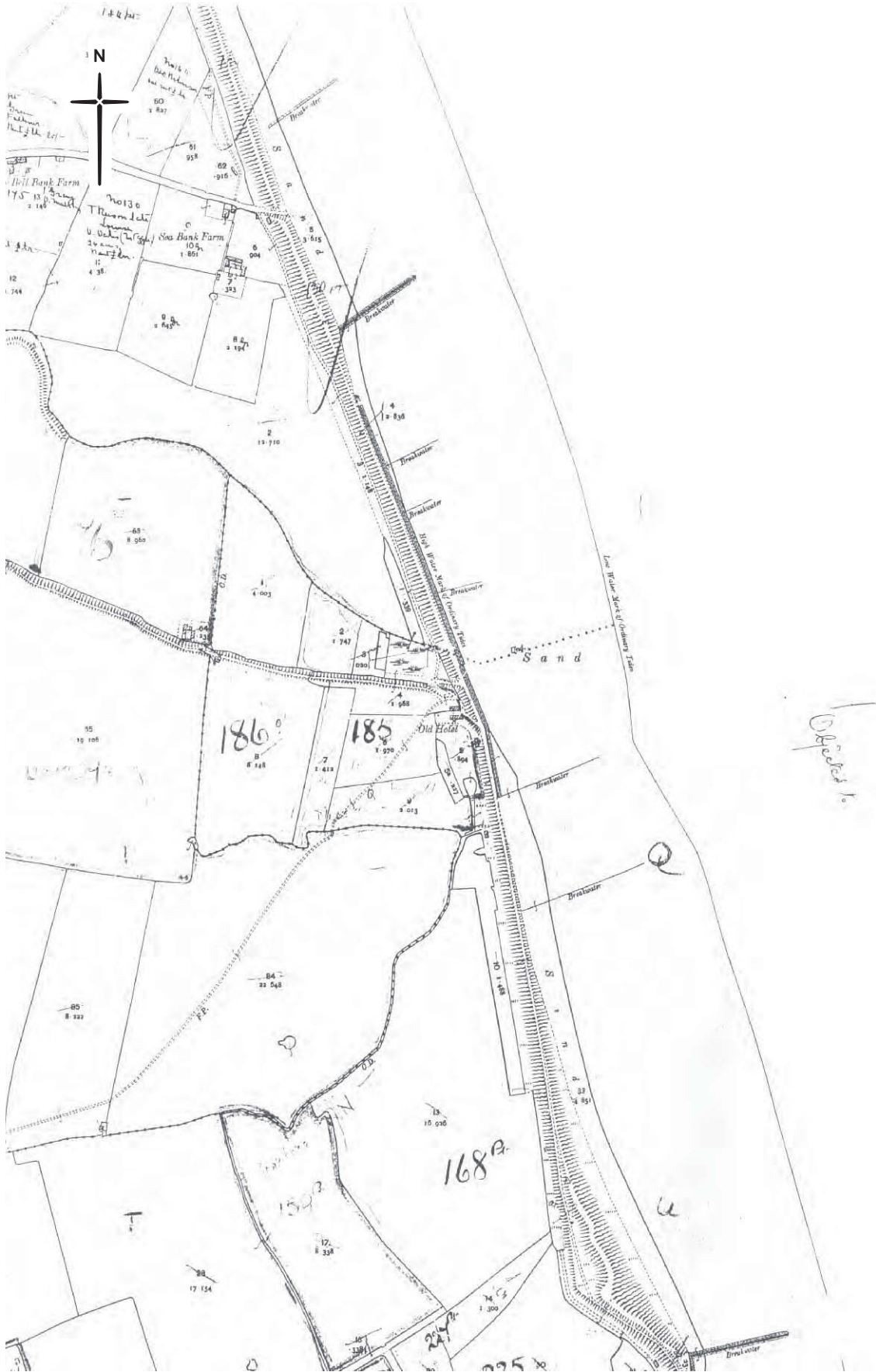


Fig 17.10 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12

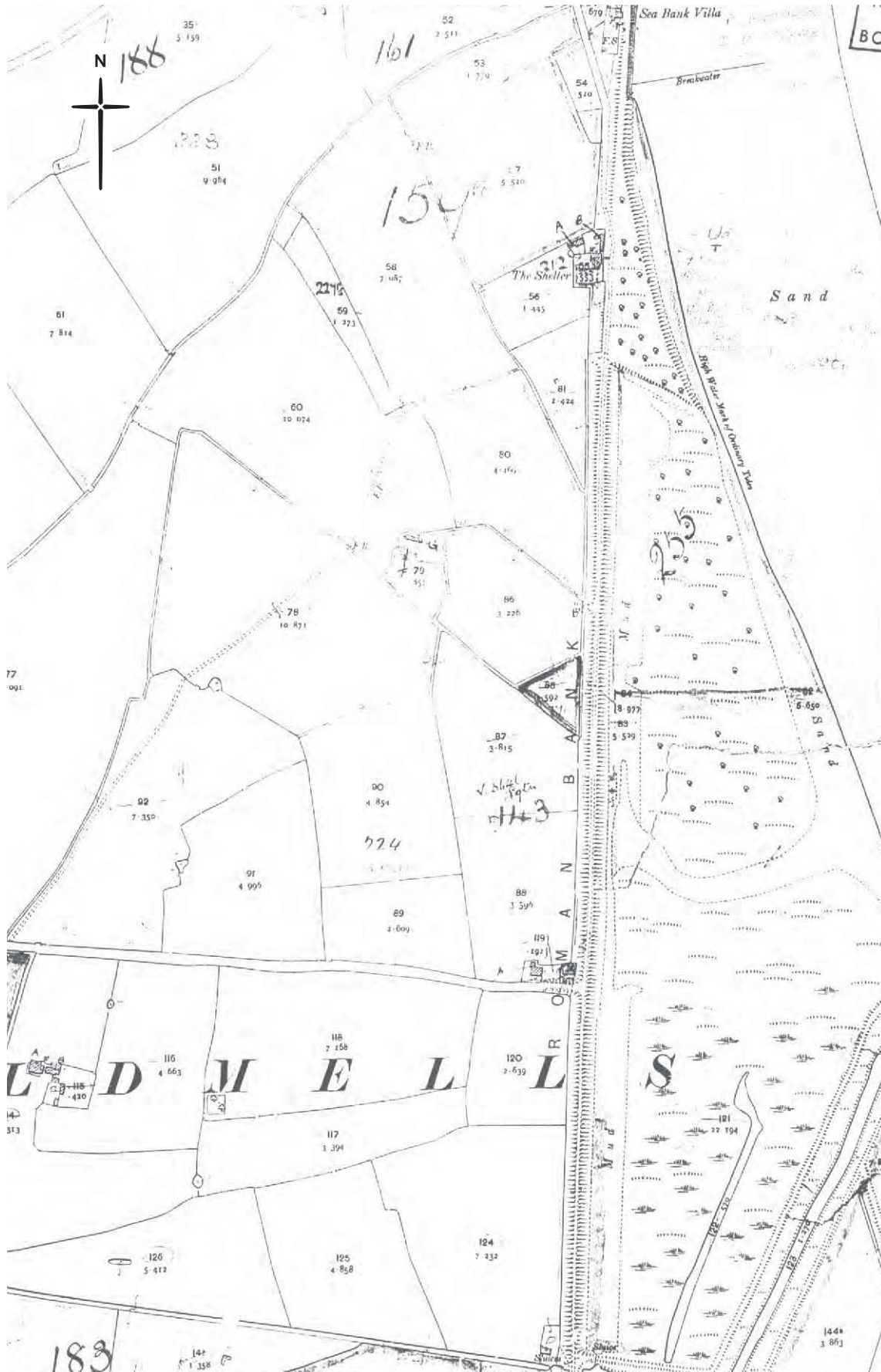


Fig 17.11 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12

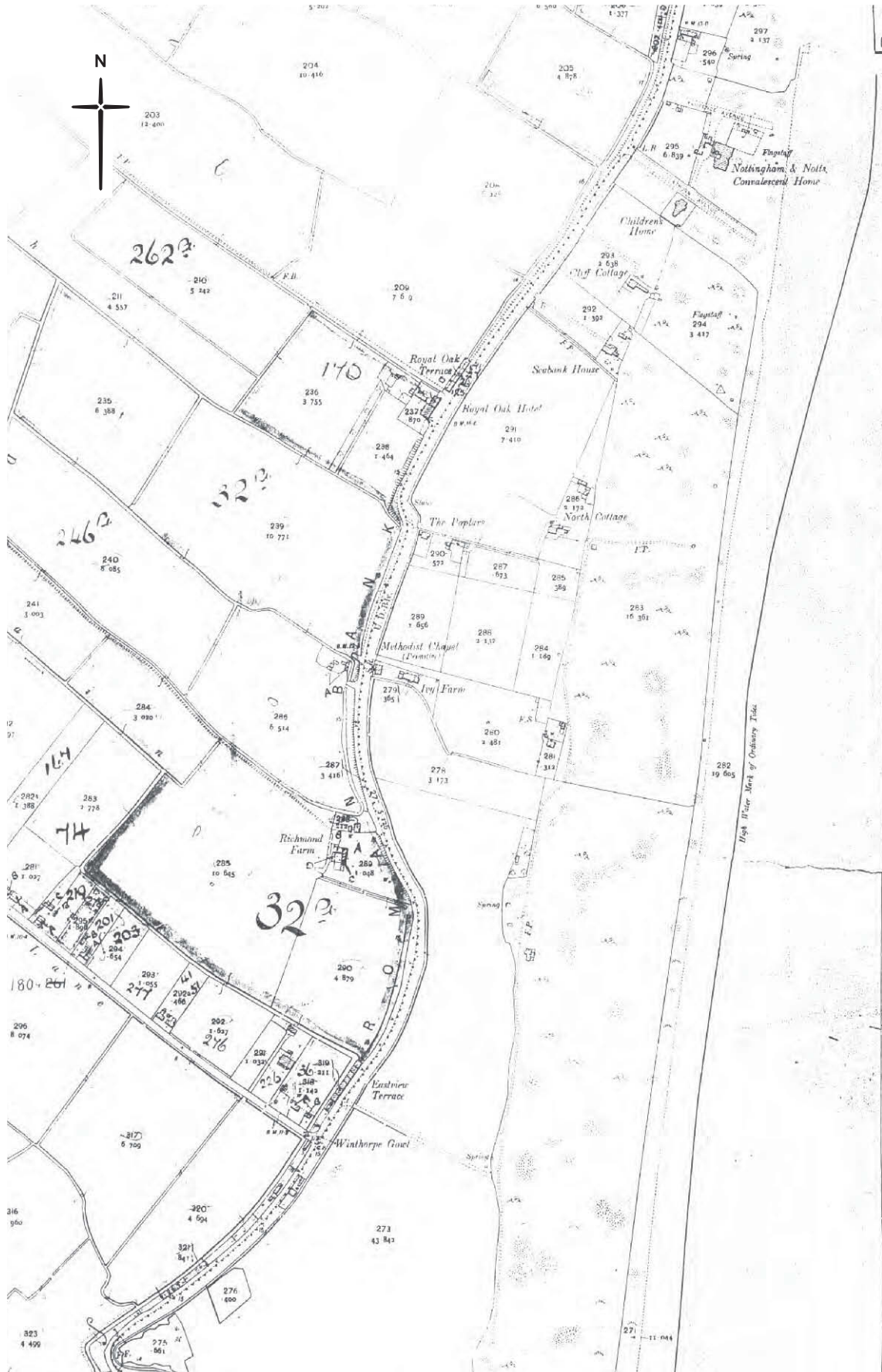


Fig 17.12 OS map Lincolnshire 25", 2nd Ed 1906, showing coastline, sheets 1-12



Fig 18.1 OS map Lincolnshire 6", 2nd Ed 1907, showing coastline, sheets 1-9

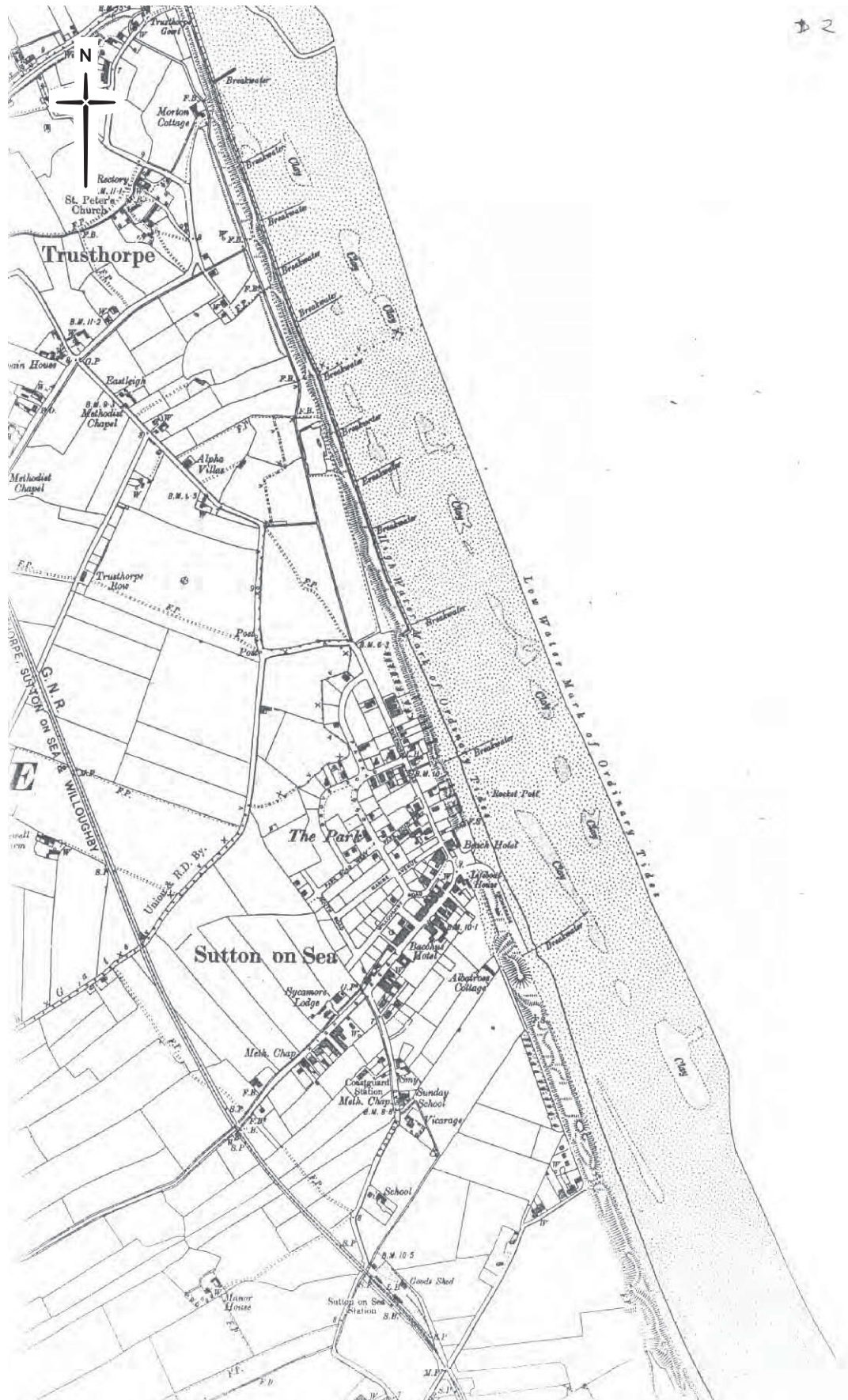


Fig 18.2 OS map Lincolnshire 6", 2nd Ed 1907, showing coastline, sheets 1-9



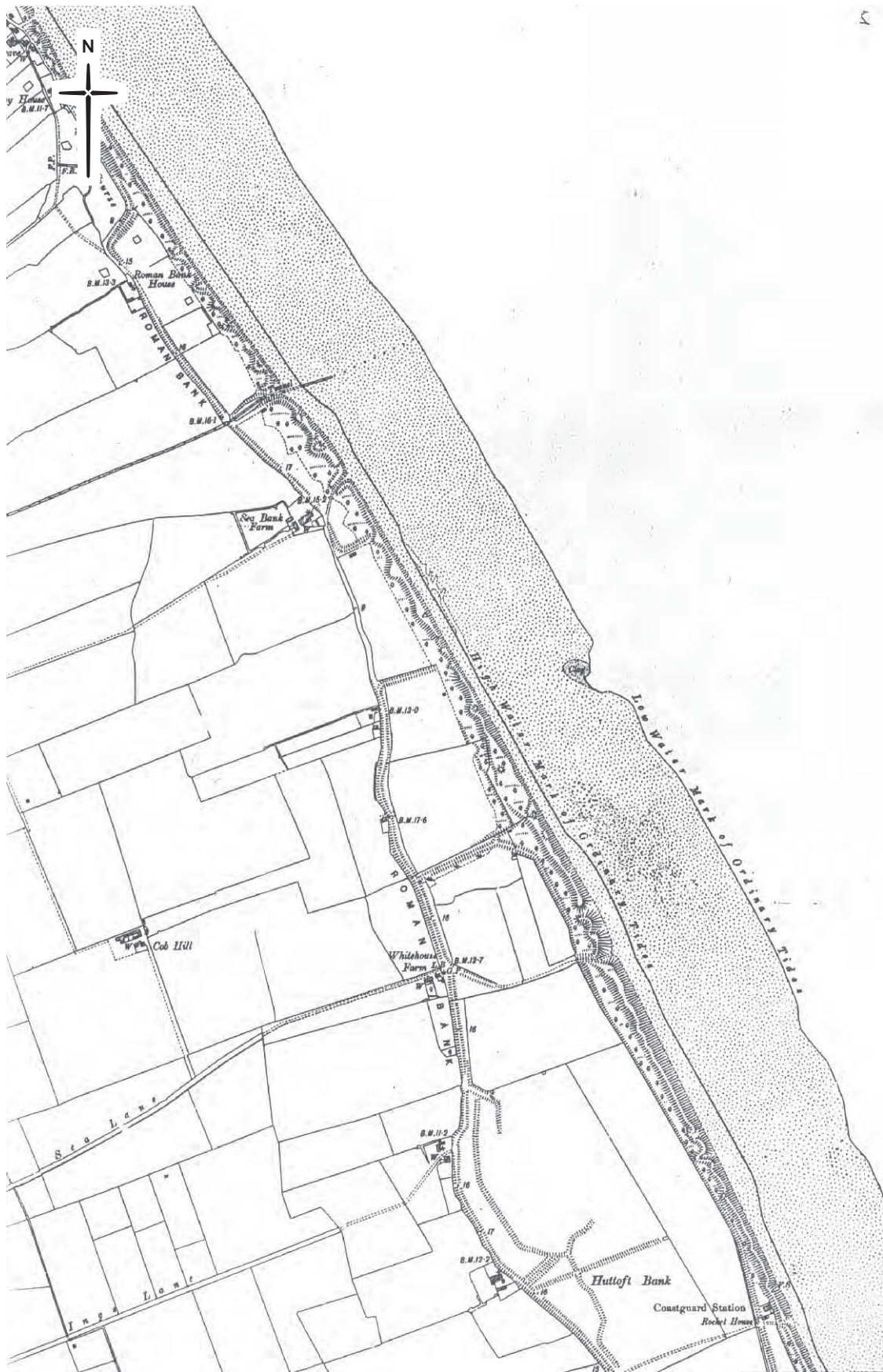


Fig 18.3 OS map Lincolnshire 6", 2nd Ed 1907, showing coastline, sheets 1-9



Fig 18.4 OS map Lincolnshire 6", 2nd Ed 1907, showing coastline, sheets 1-9

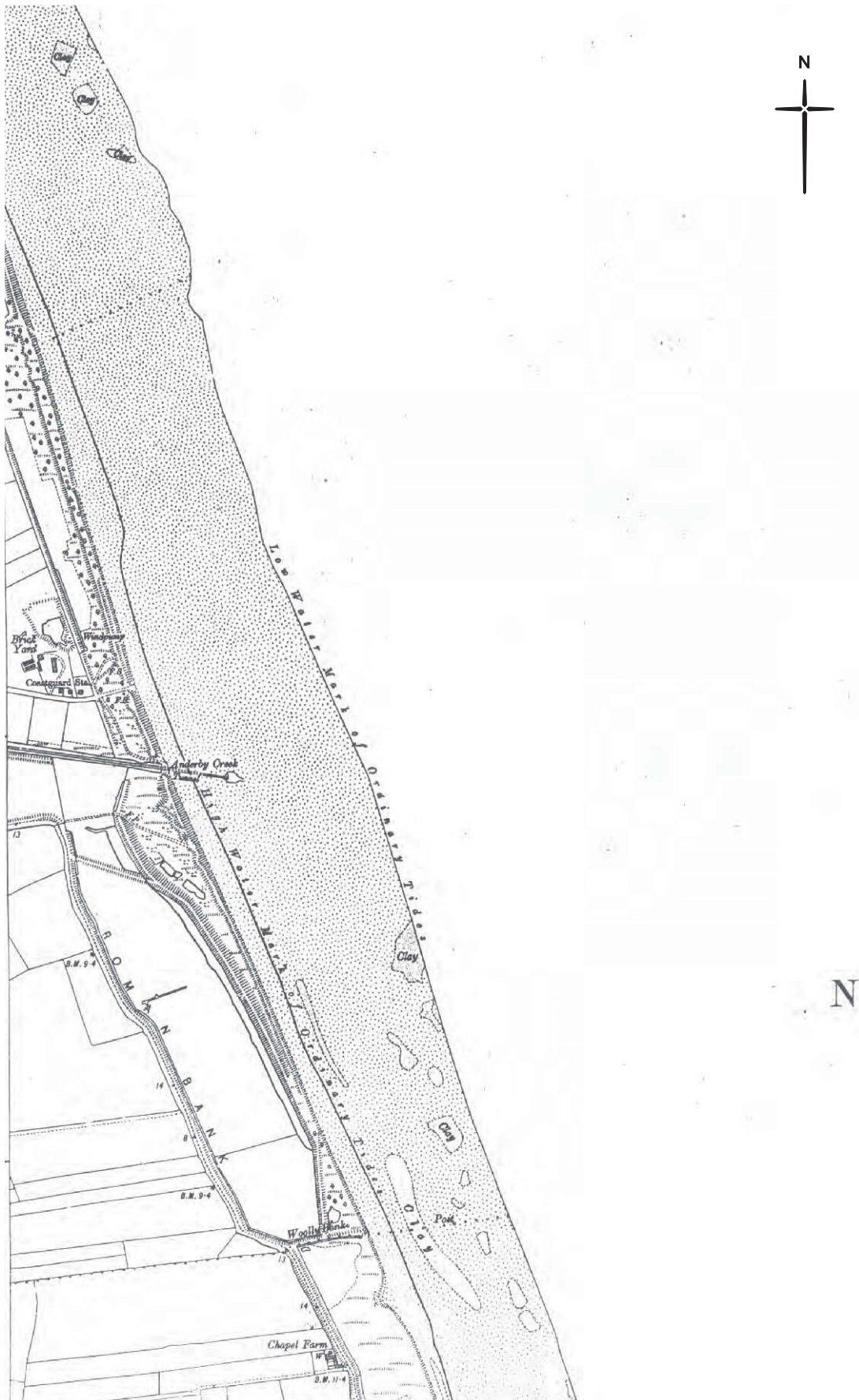


Fig 18.5 OS map Lincolnshire 6", 2nd Ed 1907, showing coastline, sheets 1-9

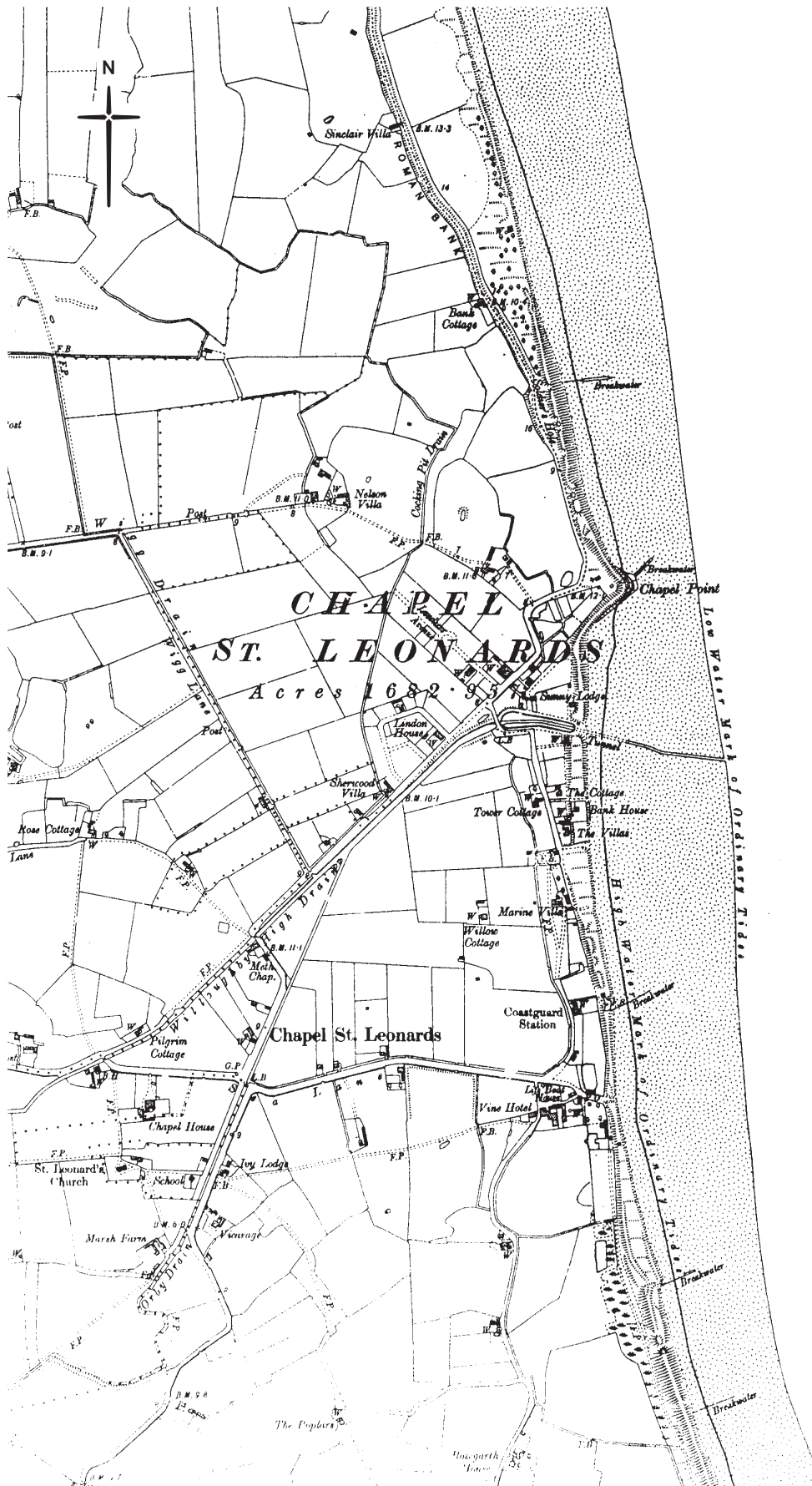


Fig 18.6 OS map Lincolnshire 6", 2nd Ed 1907, showing coastline, sheets 1-9

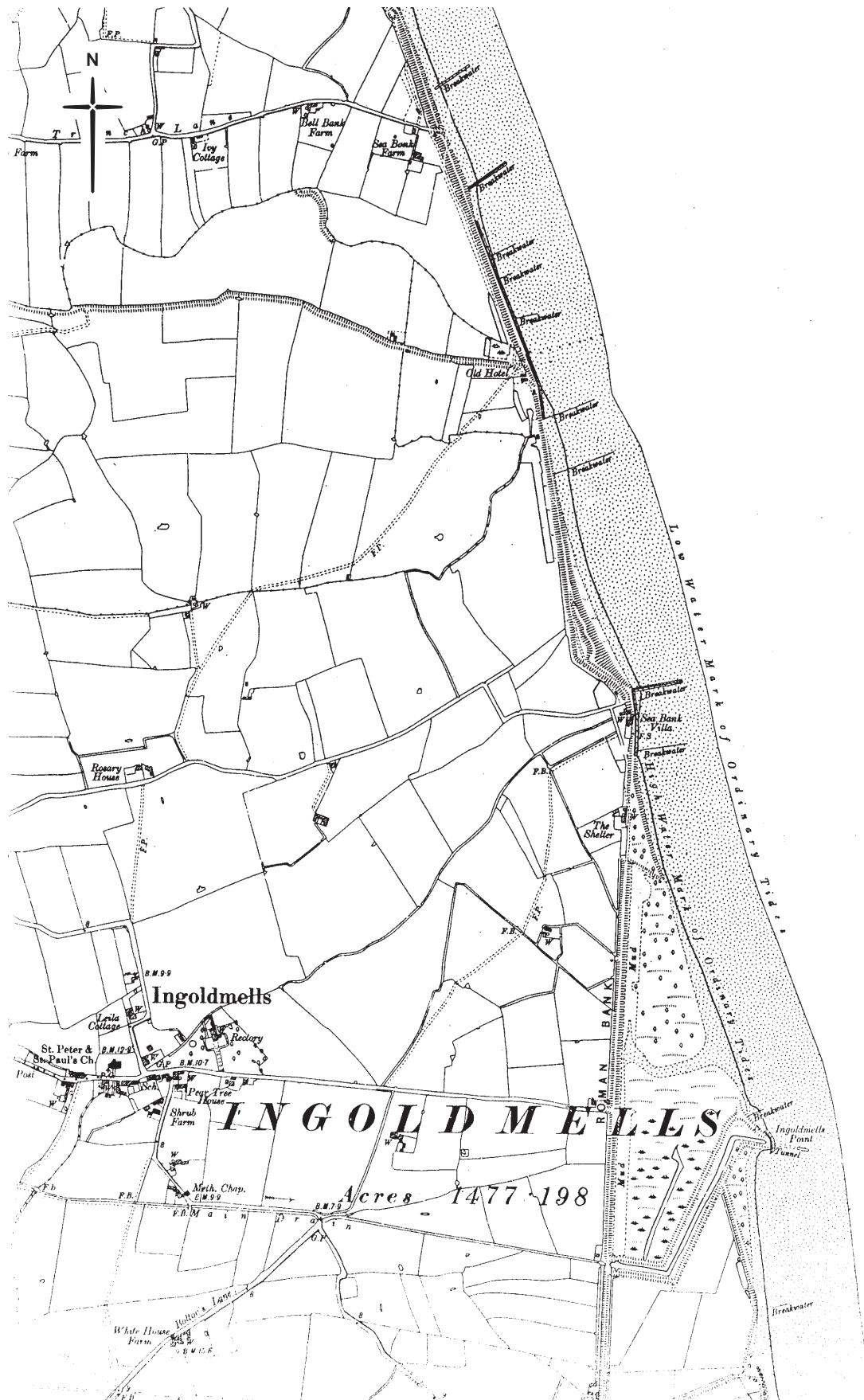


Fig 18.7 OS map Lincolnshire 6", 2nd Ed 1907, showing coastline, sheets 1-9

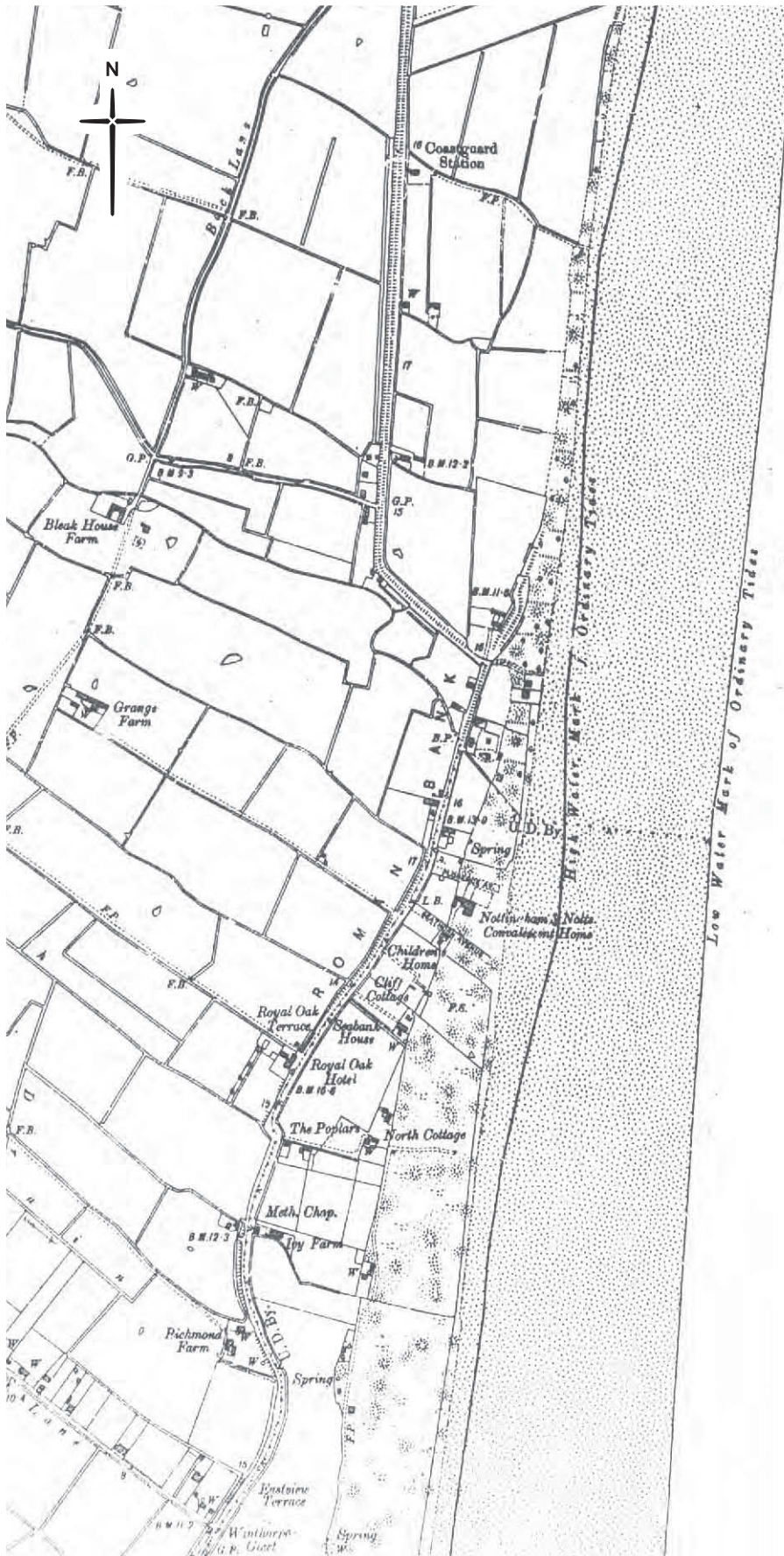


Fig 18.8 OS map Lincolnshire 6", 2nd Ed 1907, showing coastline, sheets 1-9

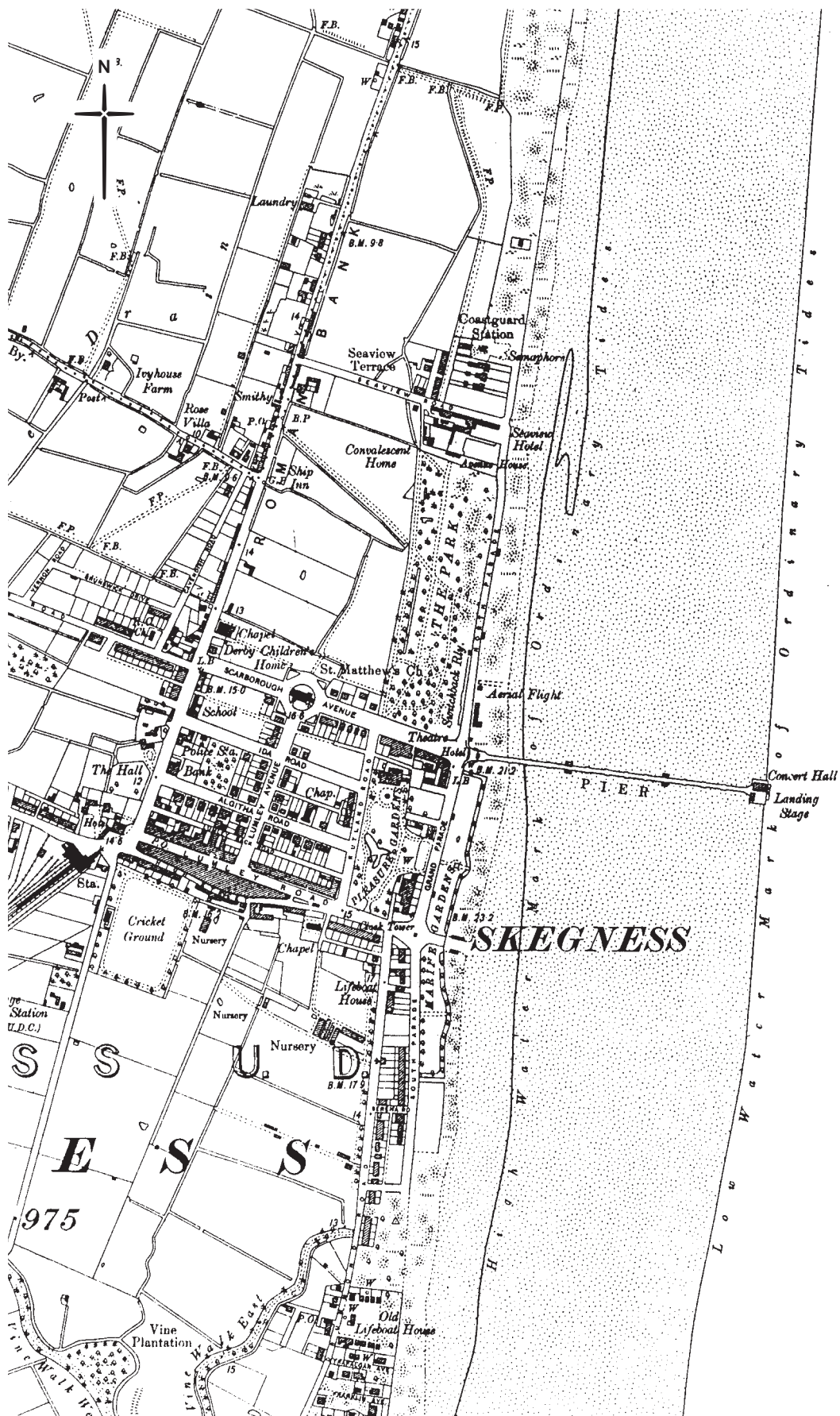


Fig 18.9 OS map Lincolnshire 6", 2nd Ed 1907, showing coastline, sheets 1-9

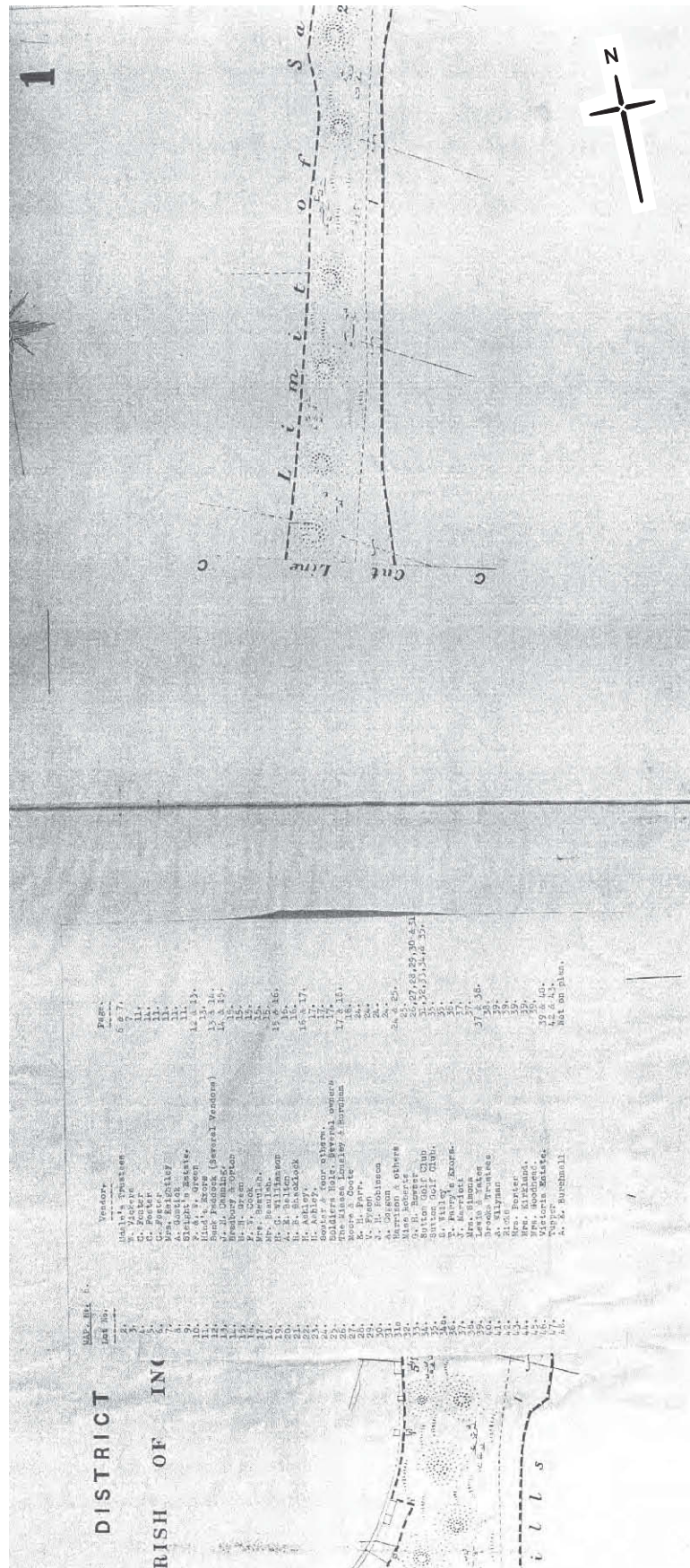


Fig 19.1 Map of coastal strip, 1937, Mablethorpe to Skegness, sheets 1-25



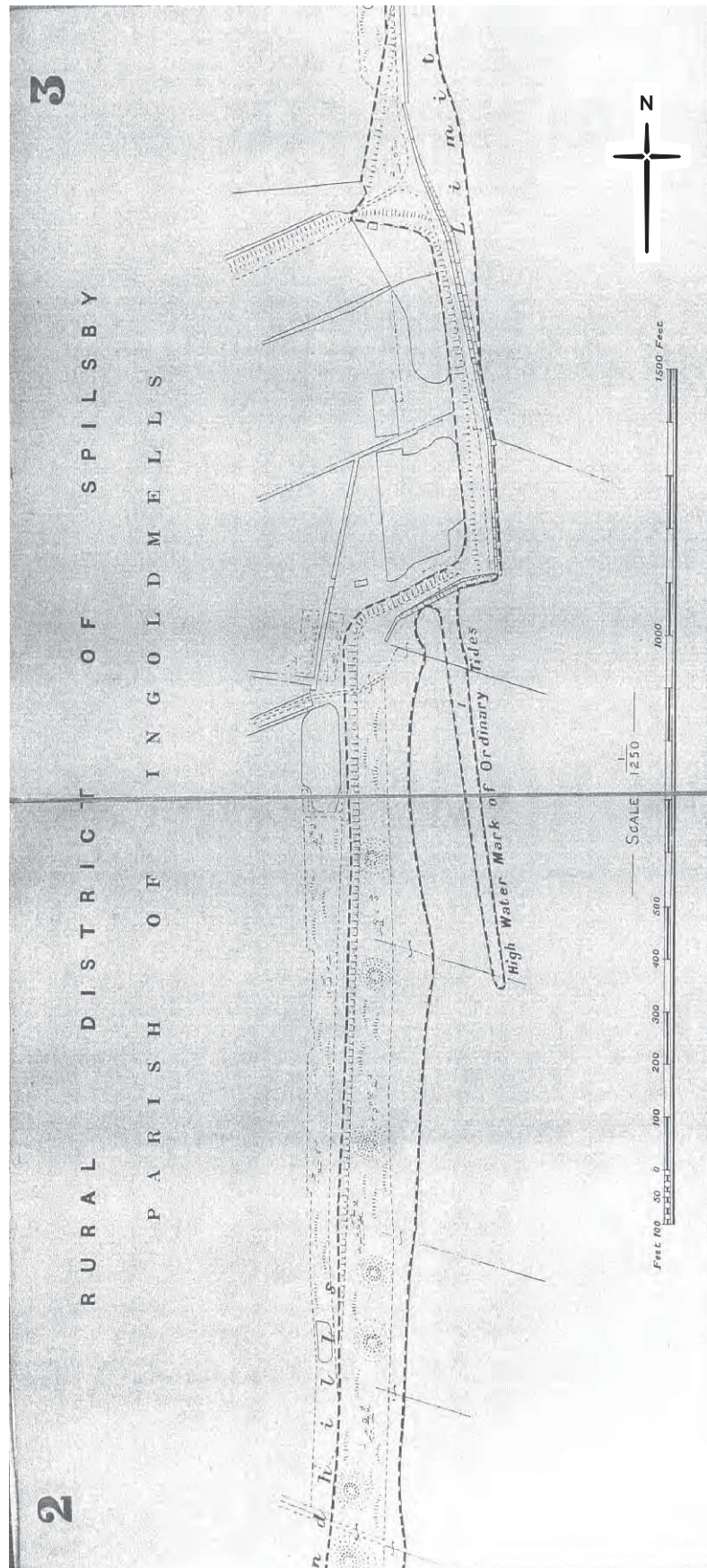


Fig 19.2 Map of coastal strip, 1937, Mablethorpe to Skegness, sheets 1-25

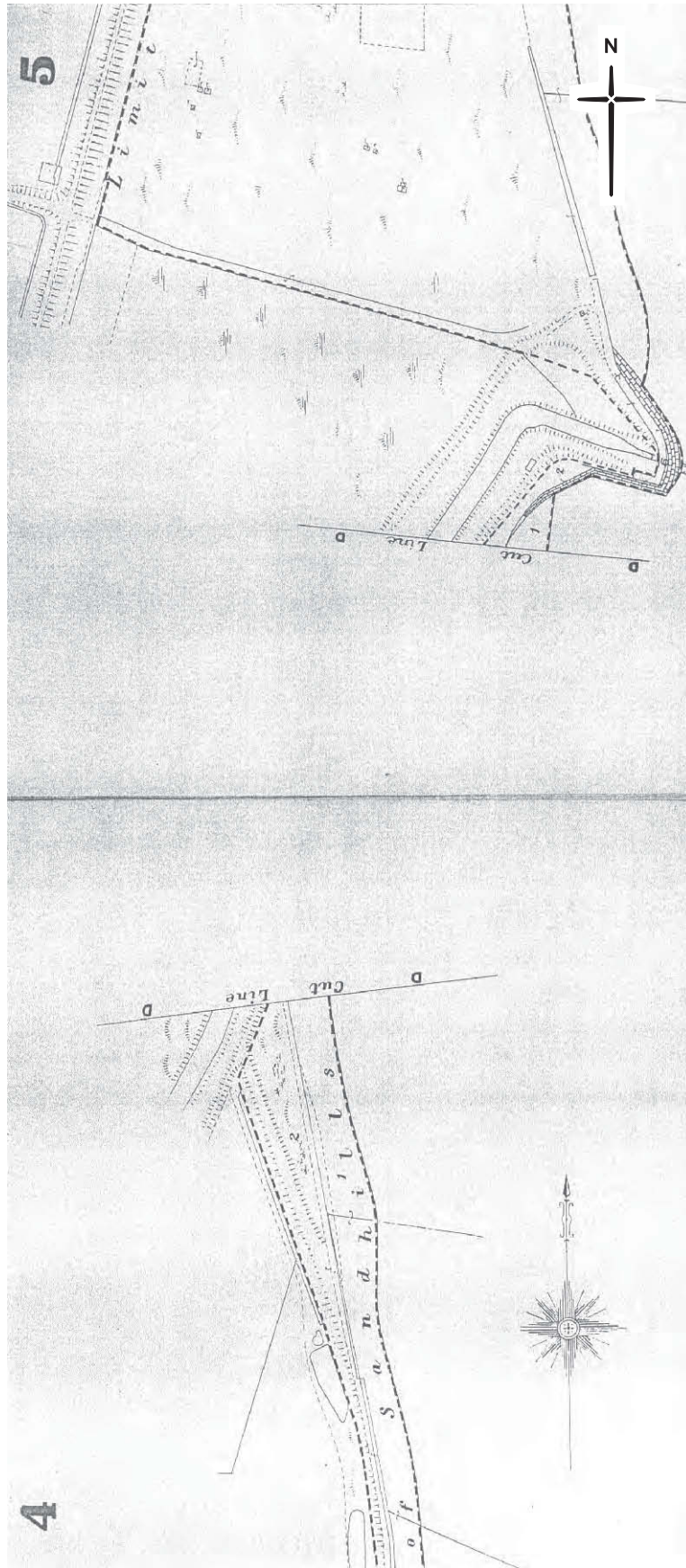


Fig 19.3 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

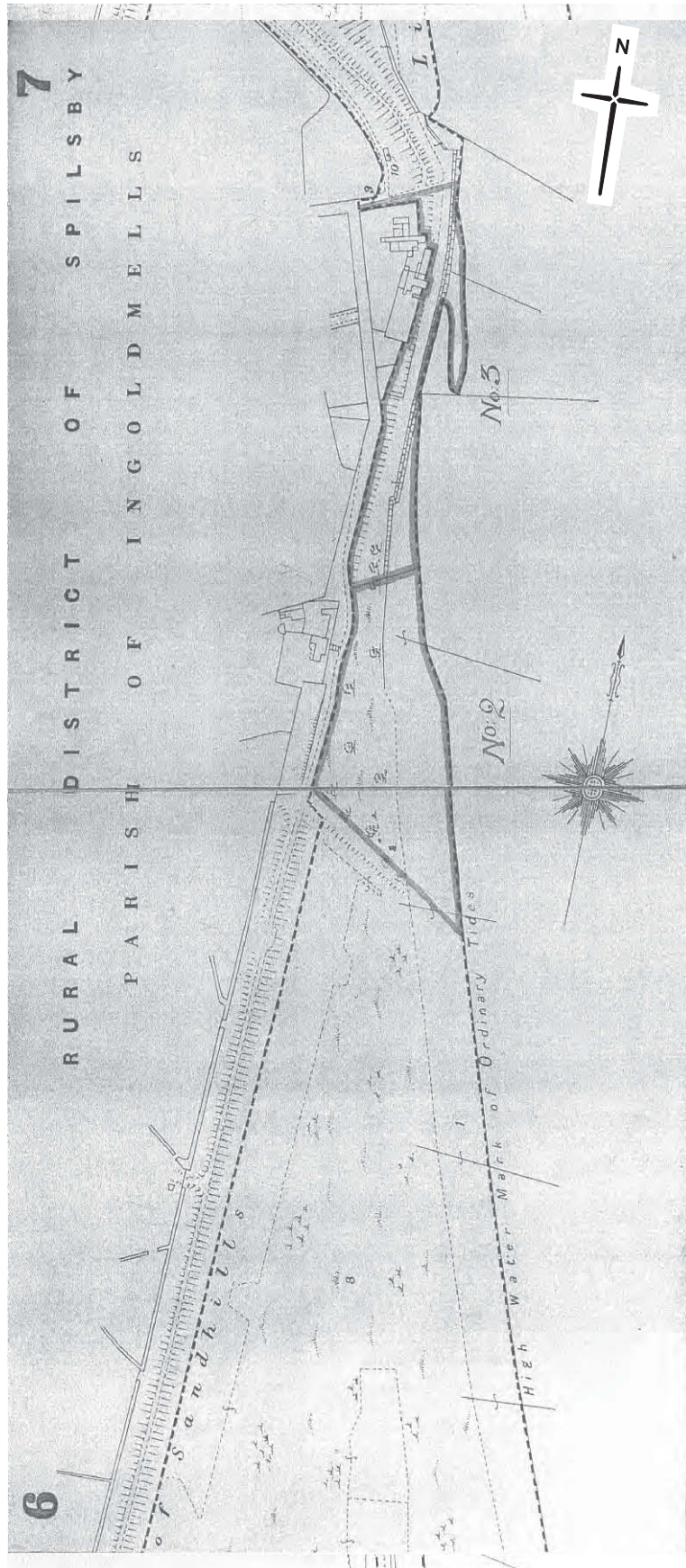


Fig 19.4 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

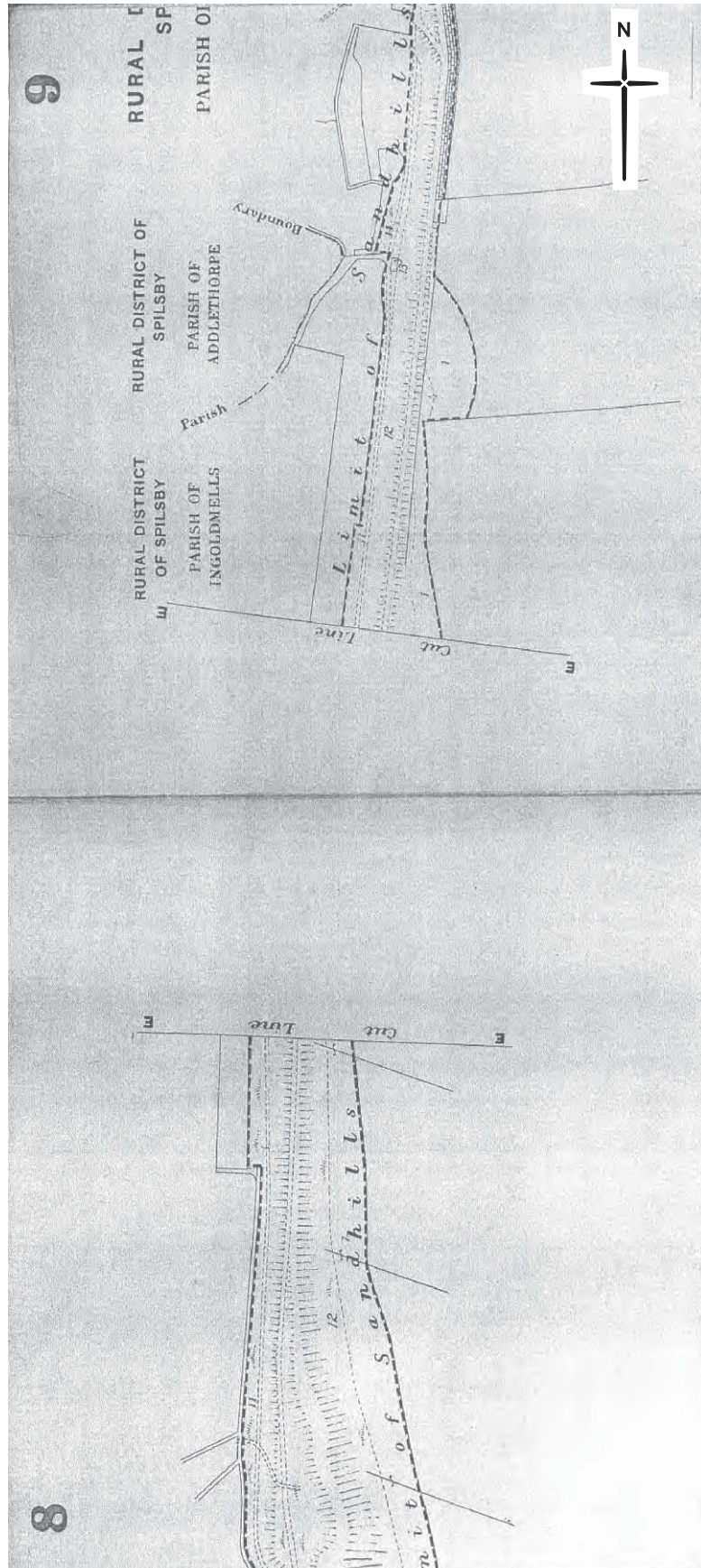


Fig 19.5 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

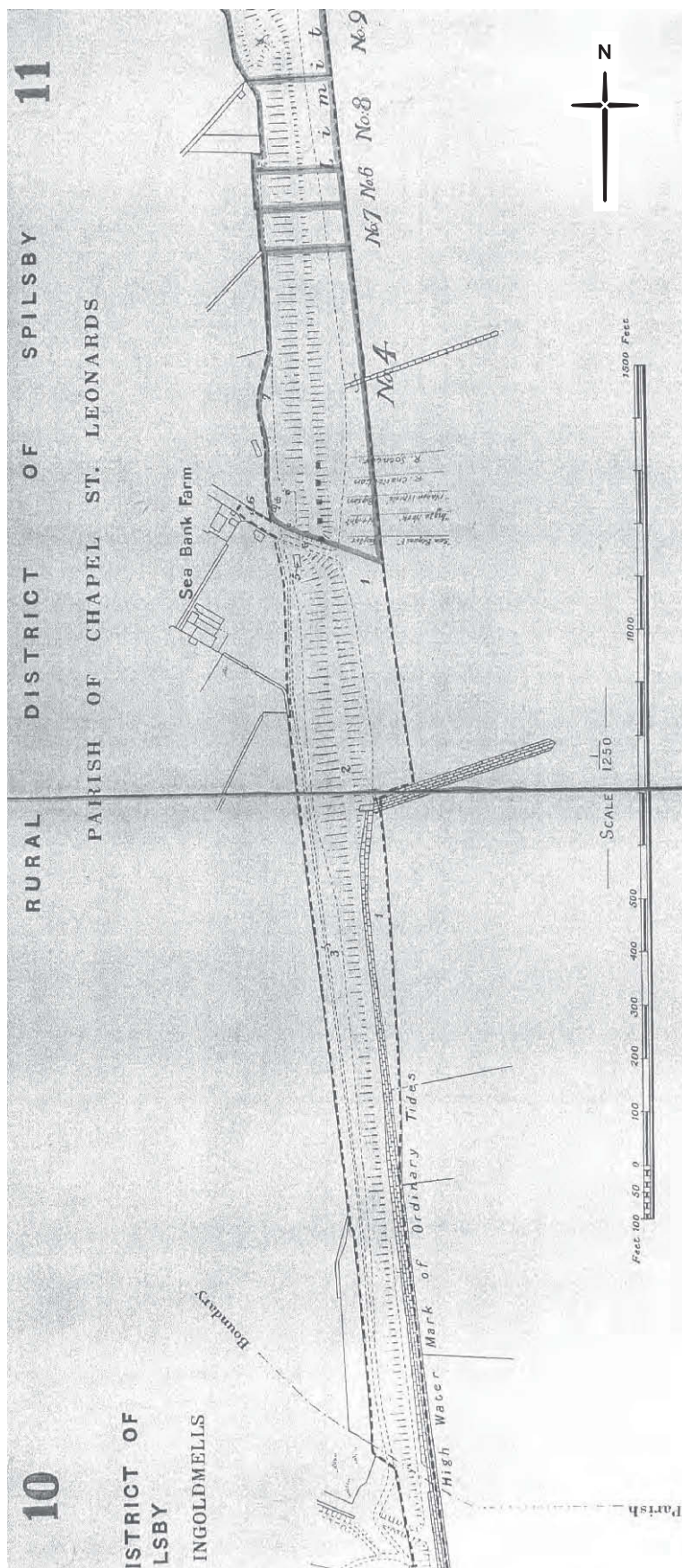


Fig 19.6 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

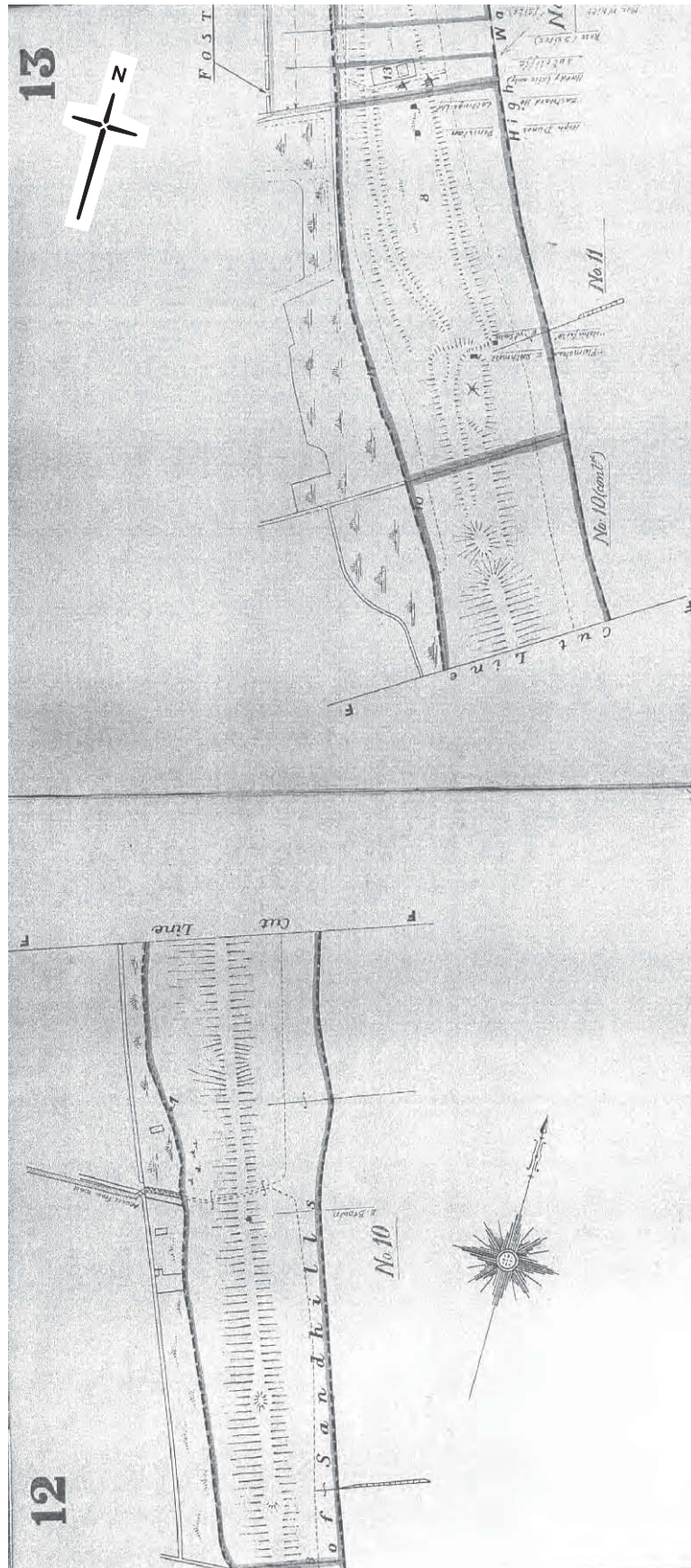


Fig 19.7 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

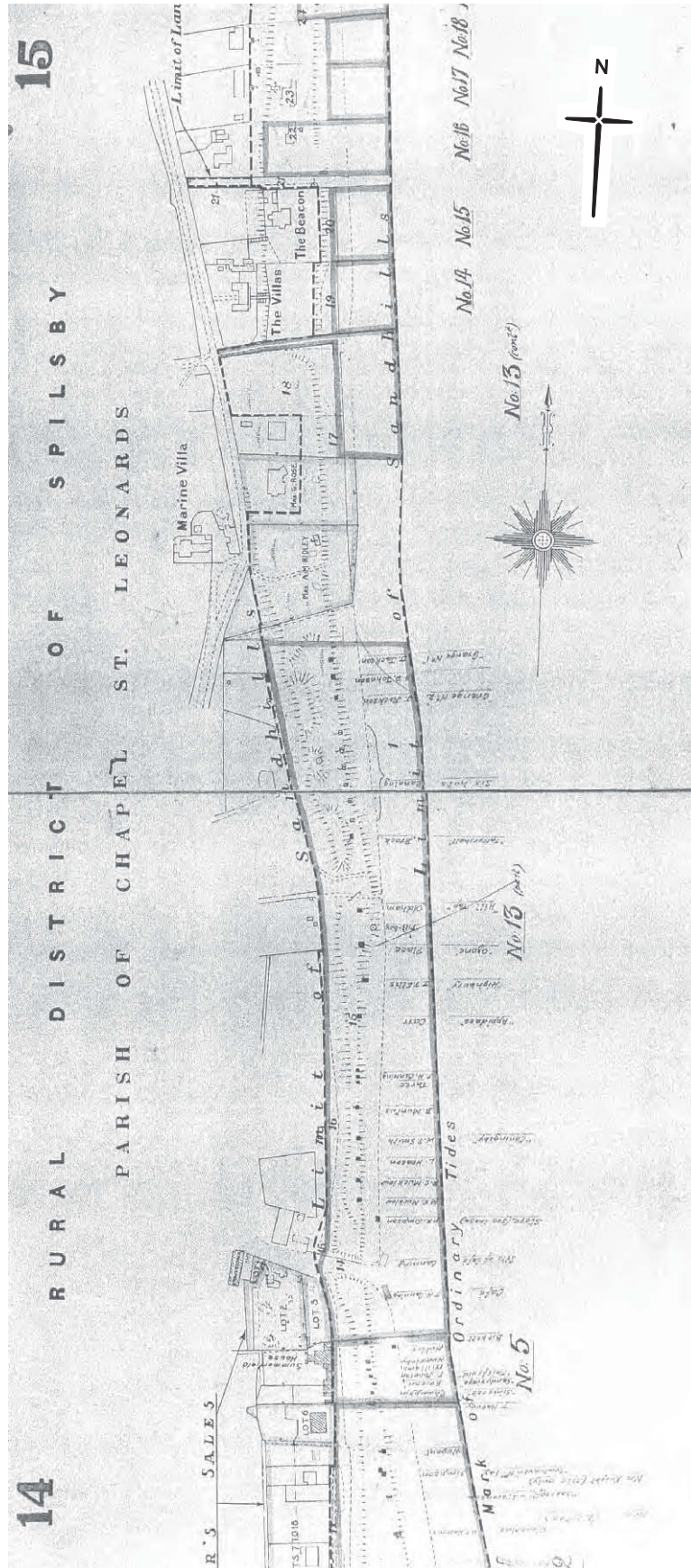


Fig 19.8 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

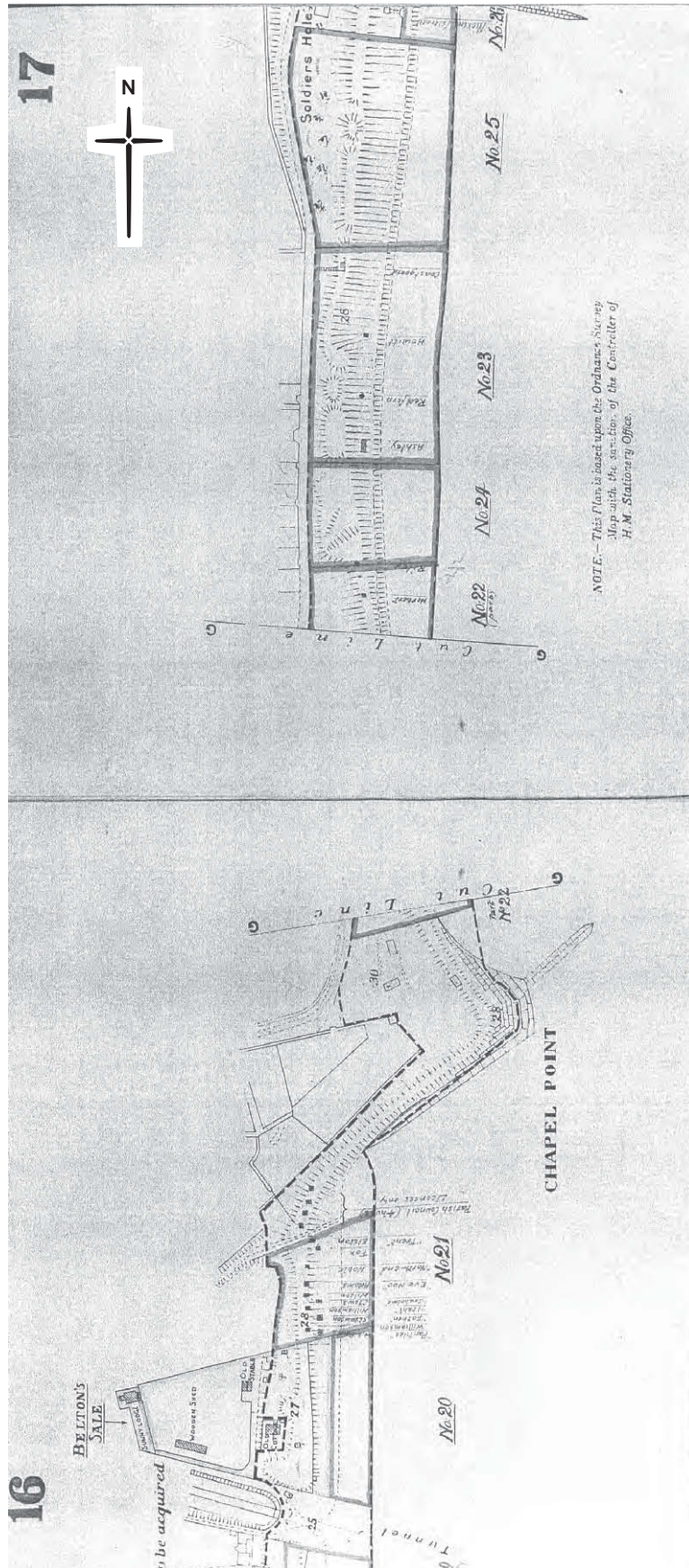


Fig 19.9 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25



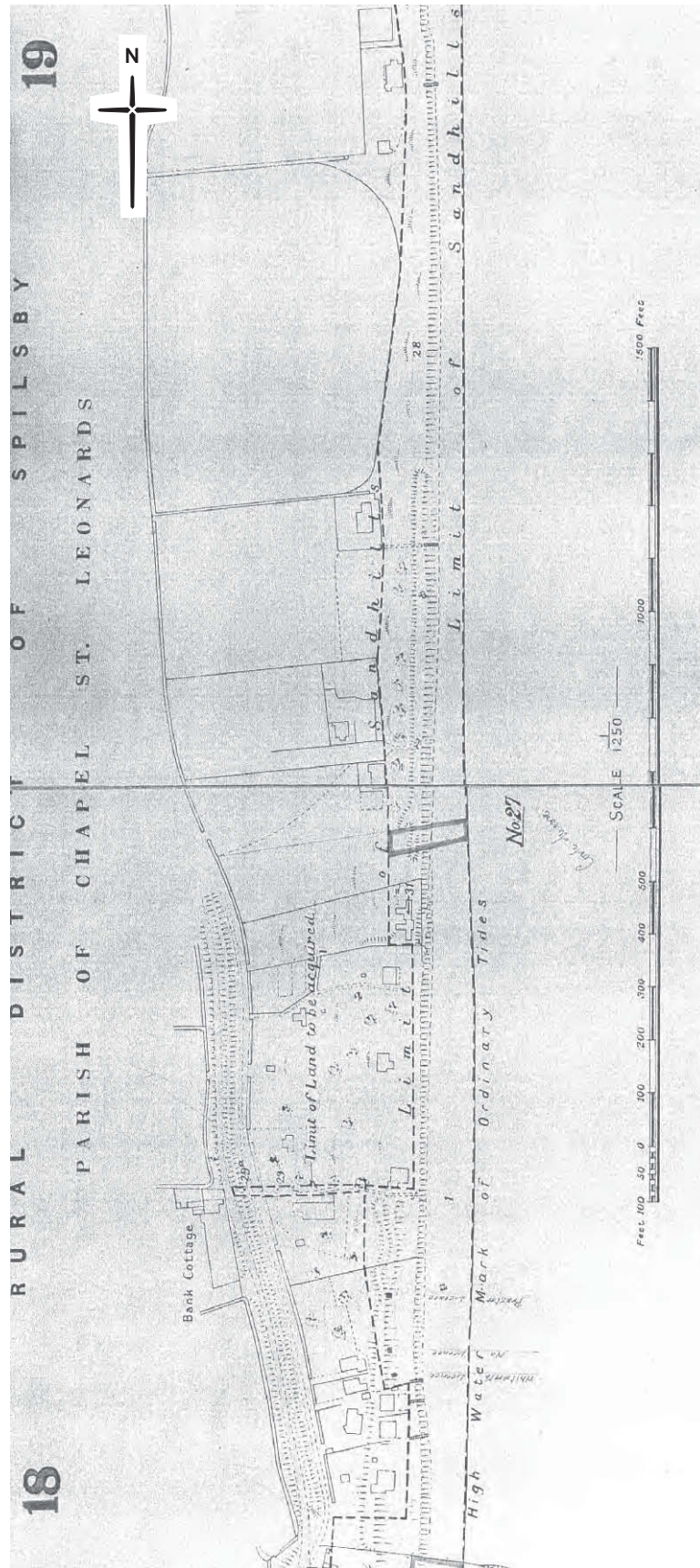


Fig 19.10 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

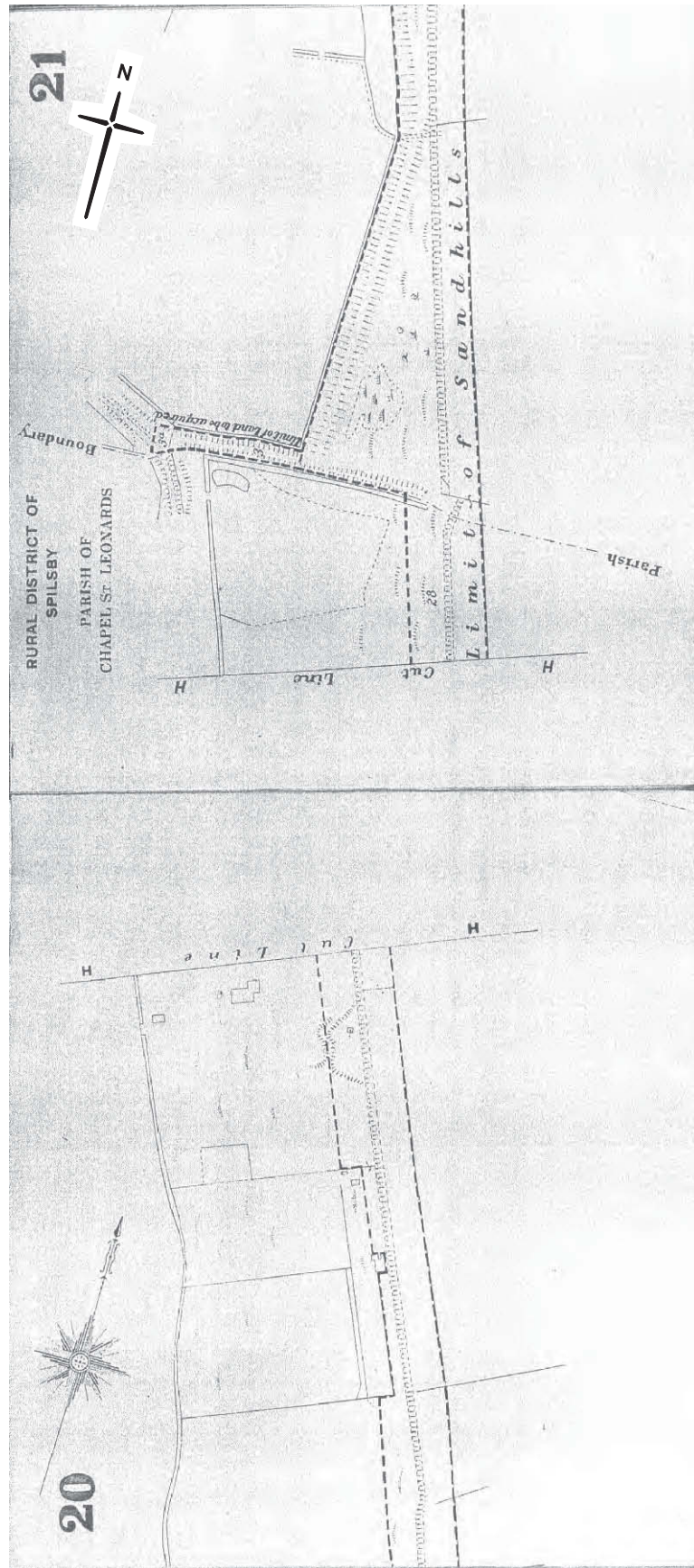


Fig 19.11 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

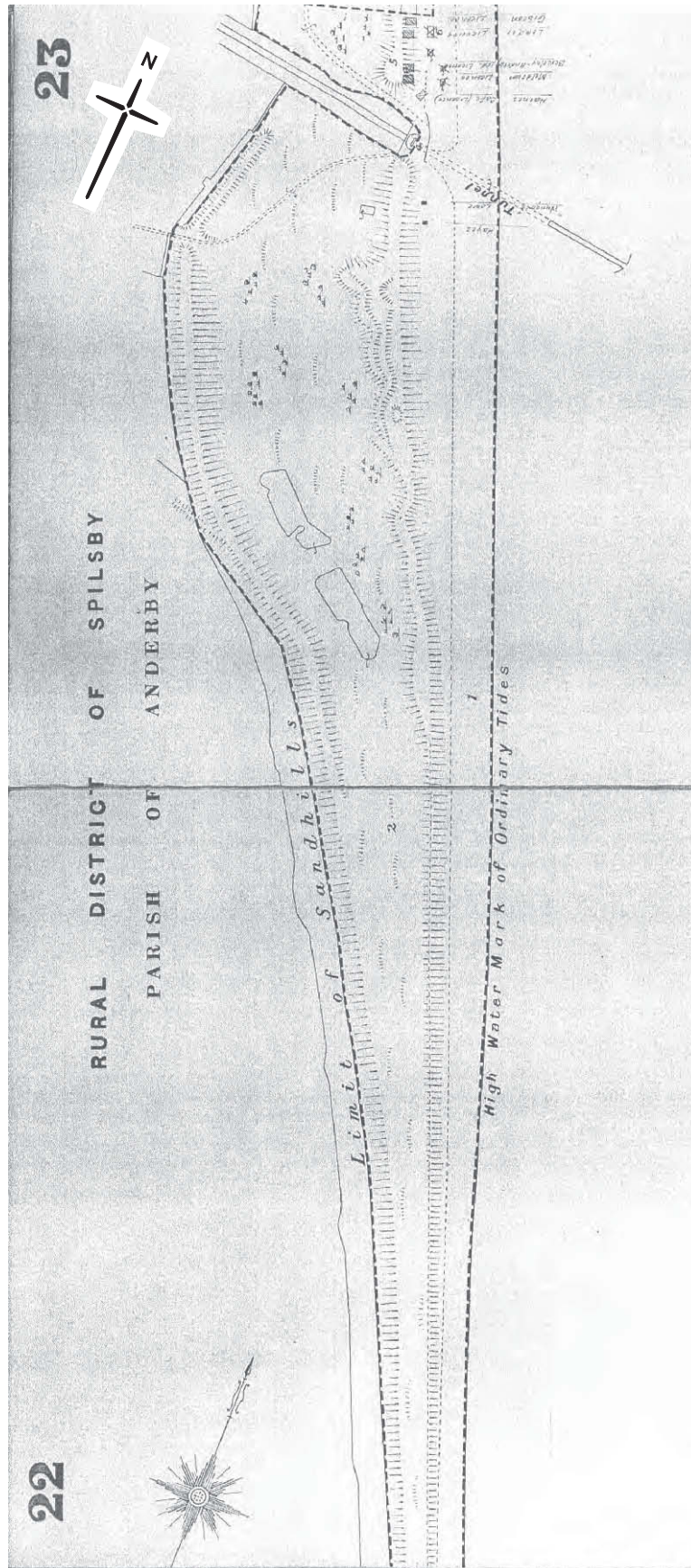


Fig 19.12 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

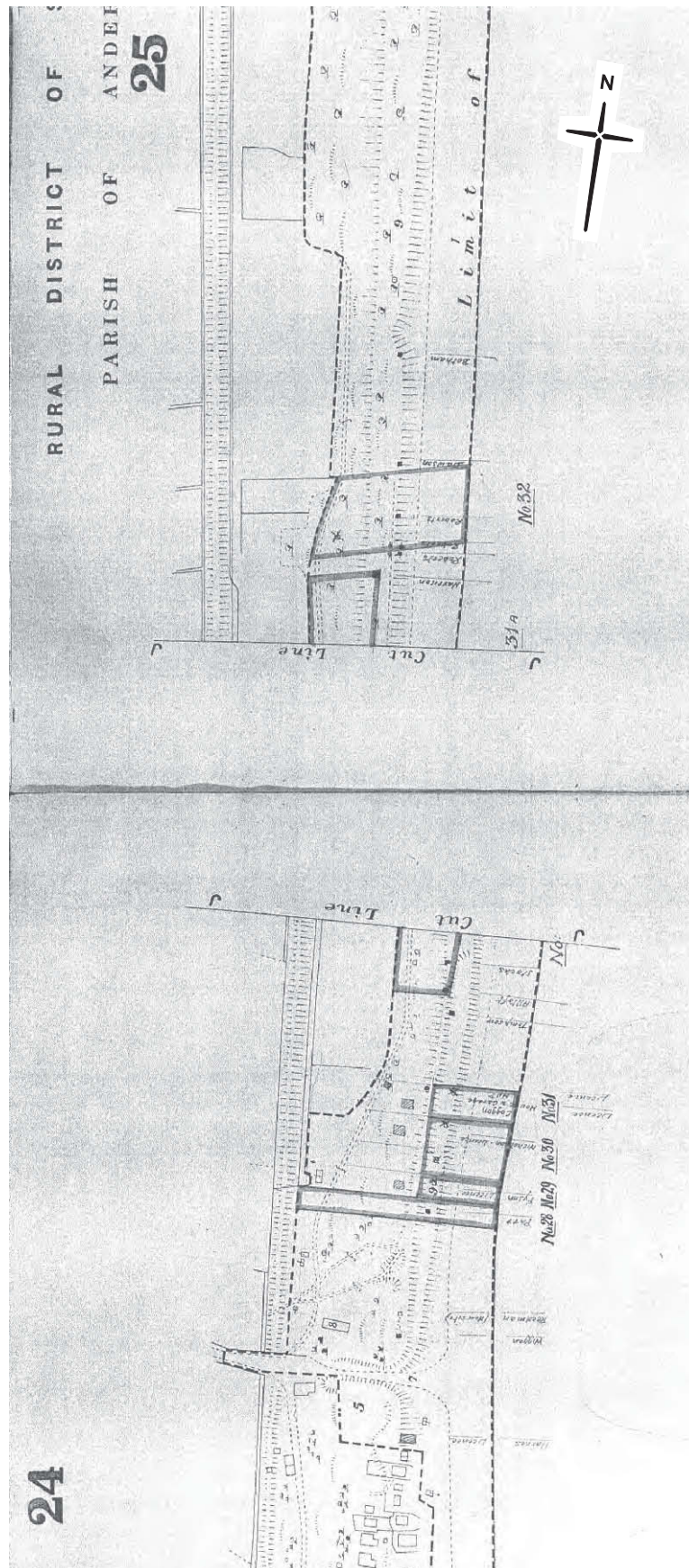


Fig 19.13 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

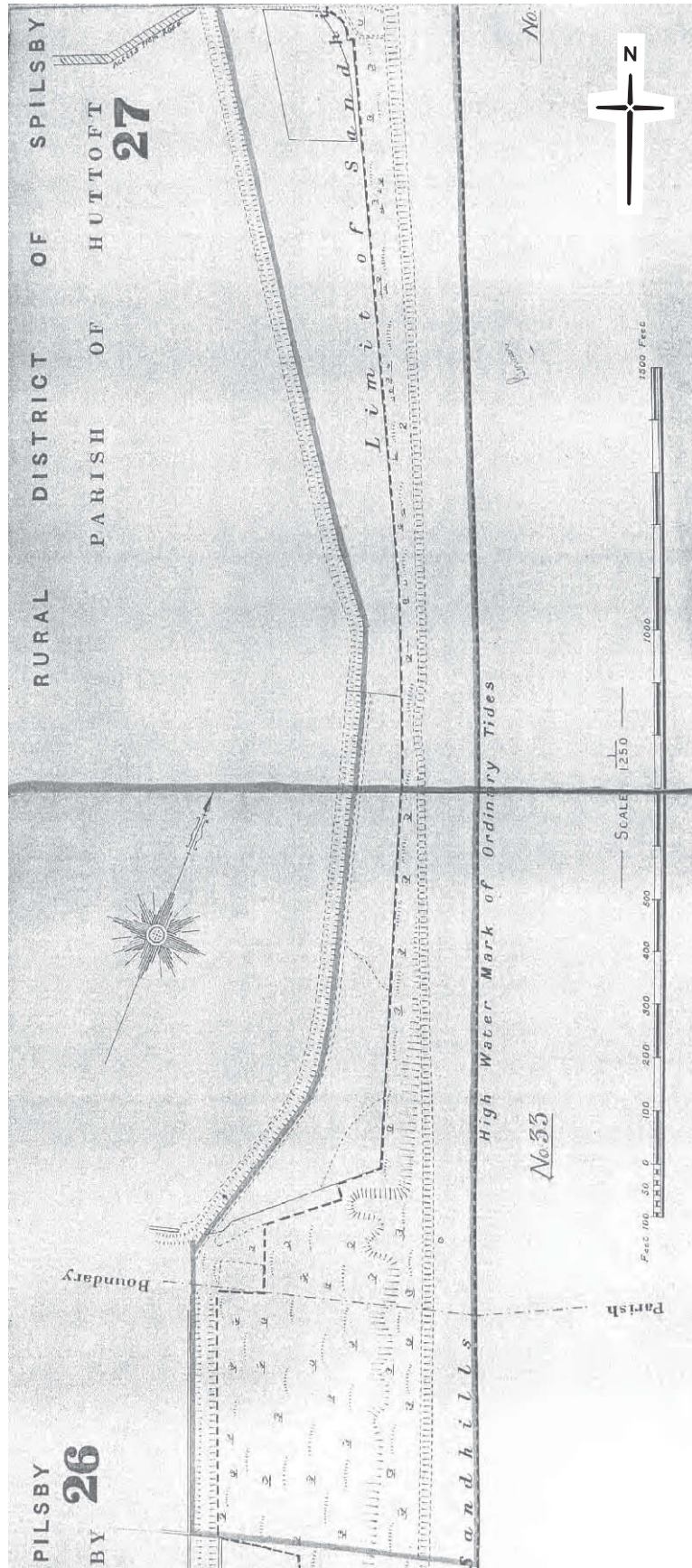


Fig 19.14 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

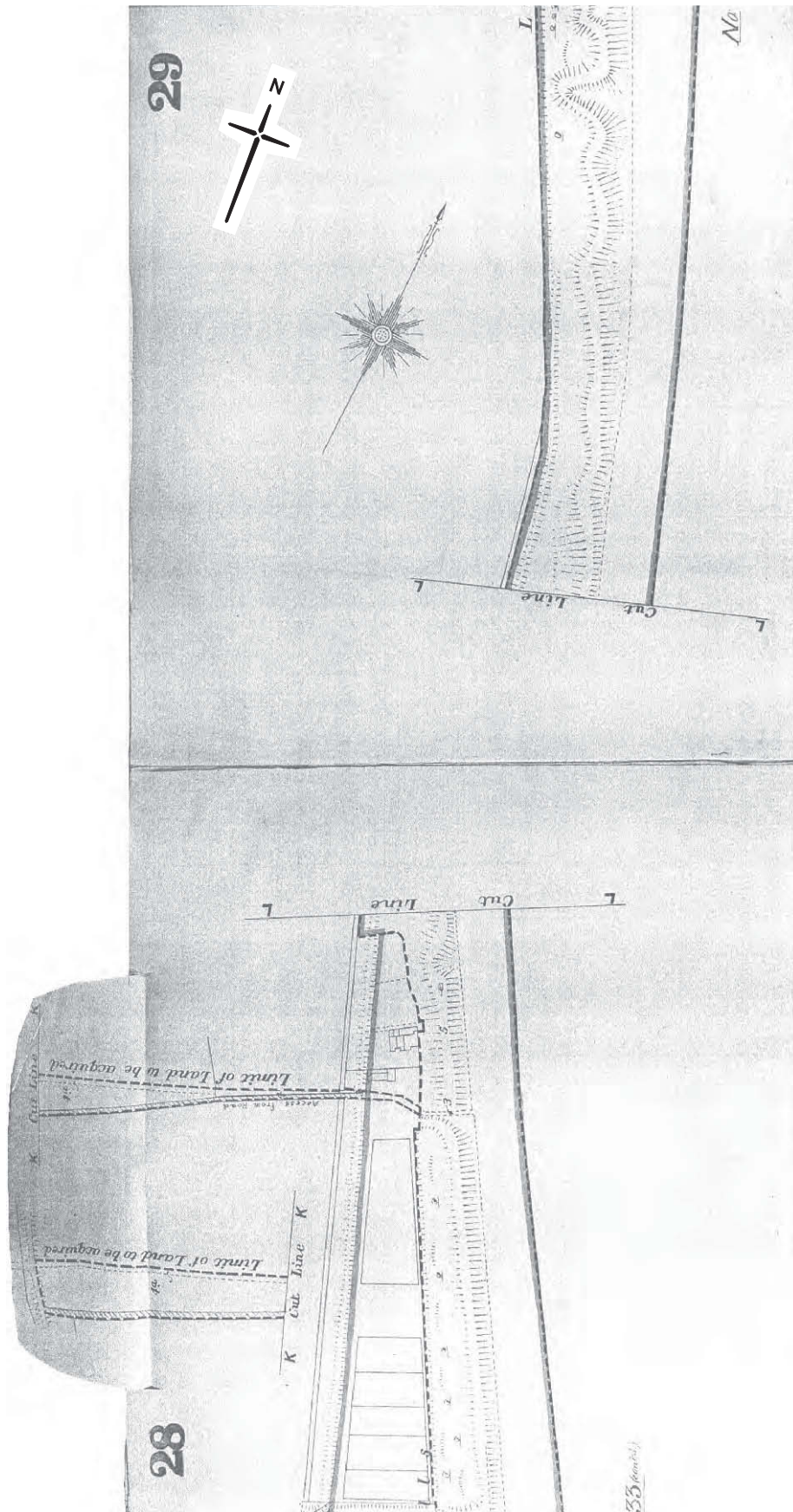


Fig 19.15 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

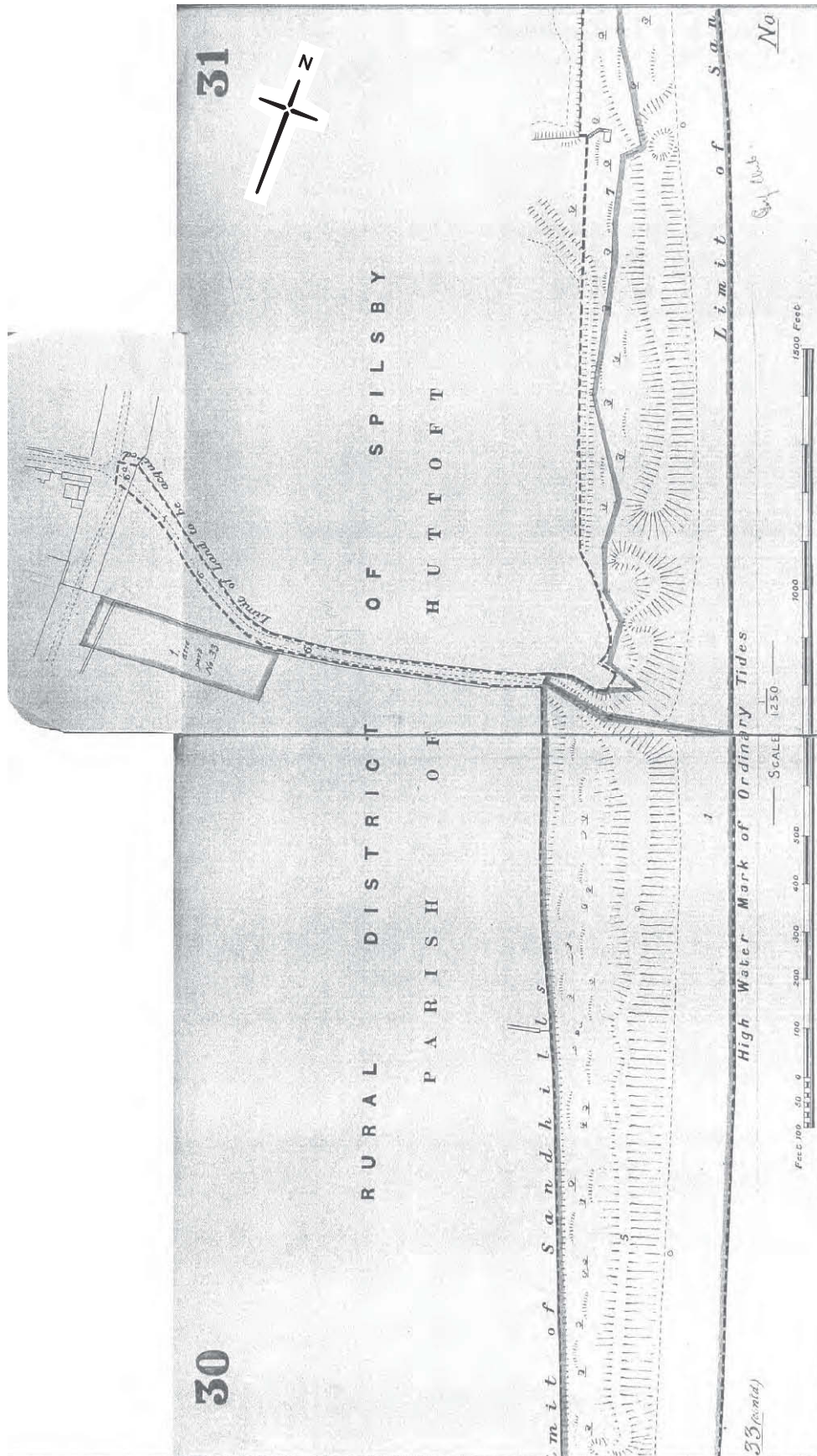


Fig 19.16 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

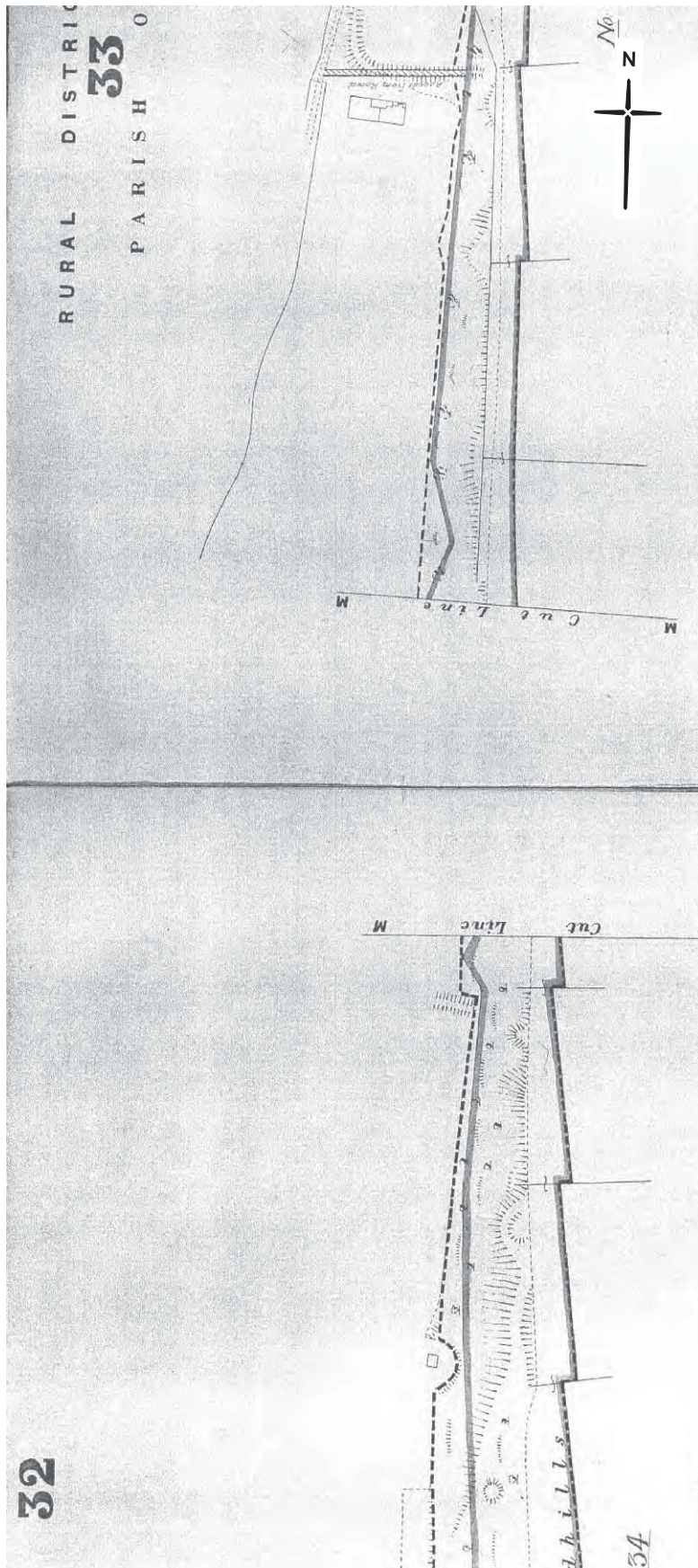


Fig 19.17 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25



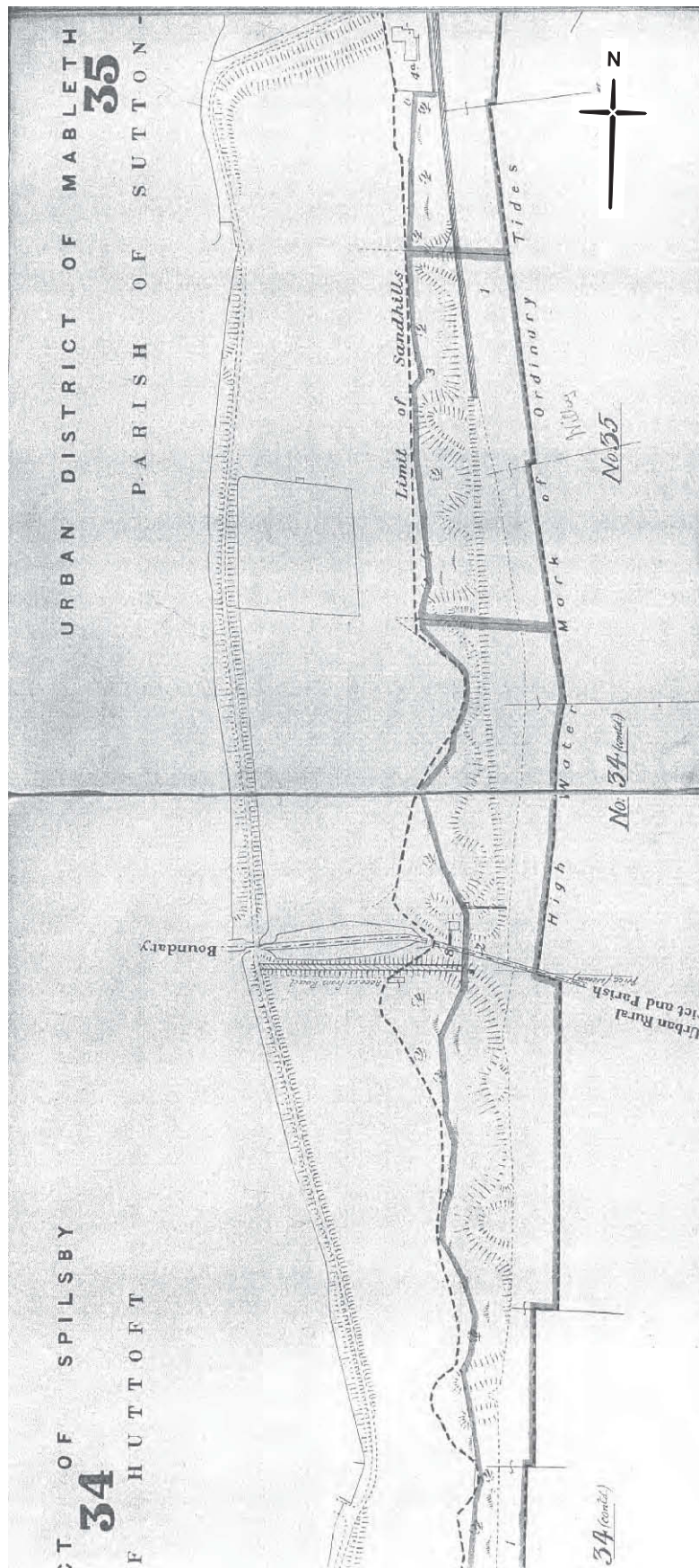


Fig 19.18 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

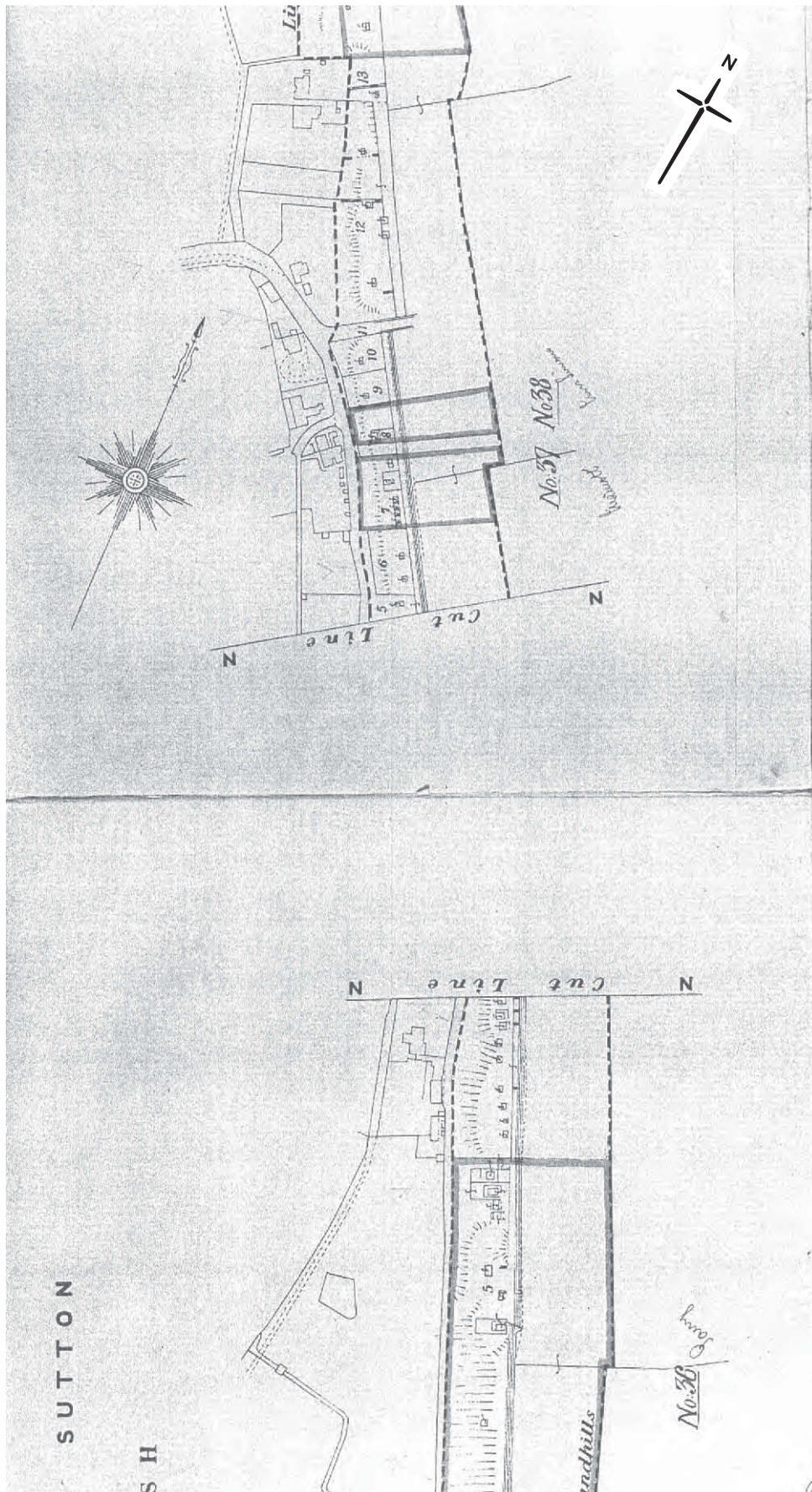


Fig 19.19 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

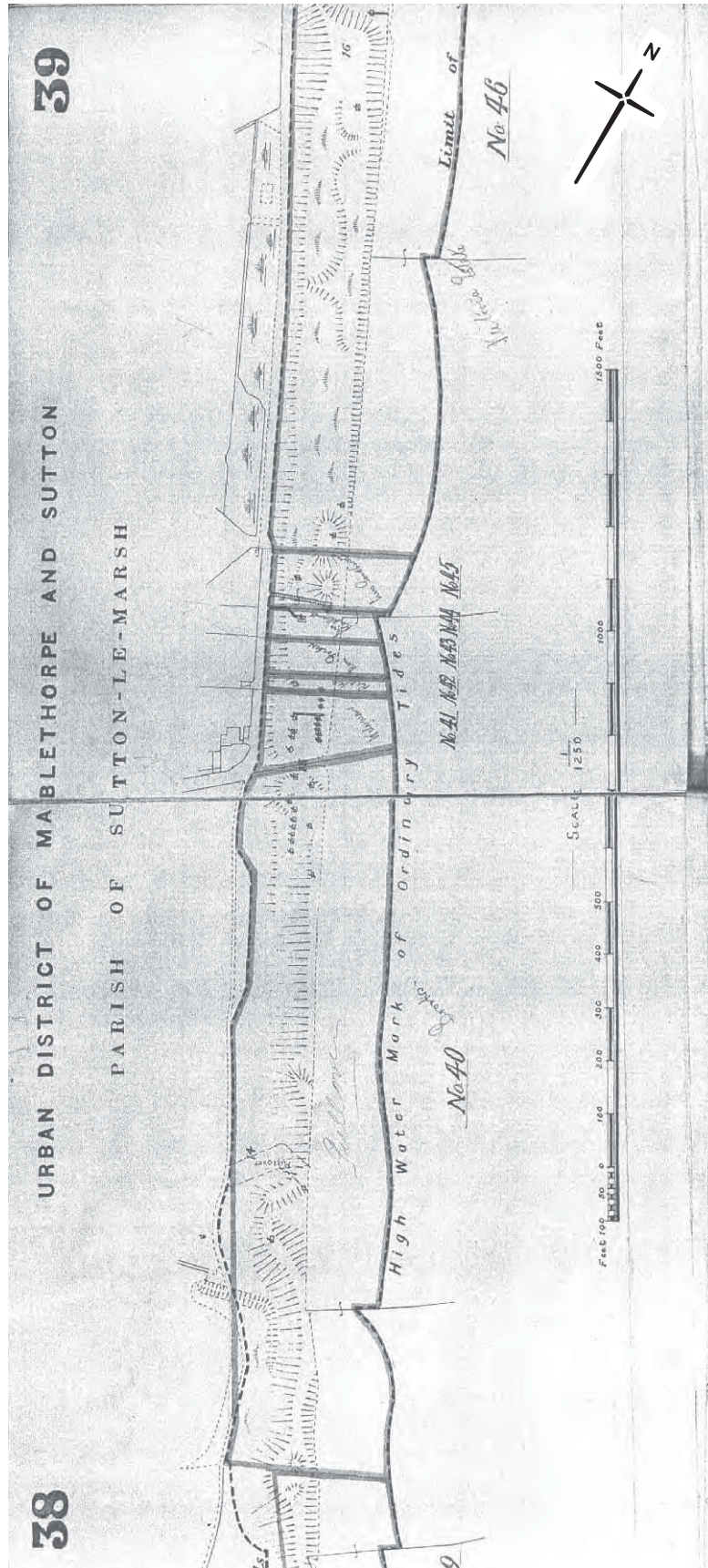


Fig 19.20 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

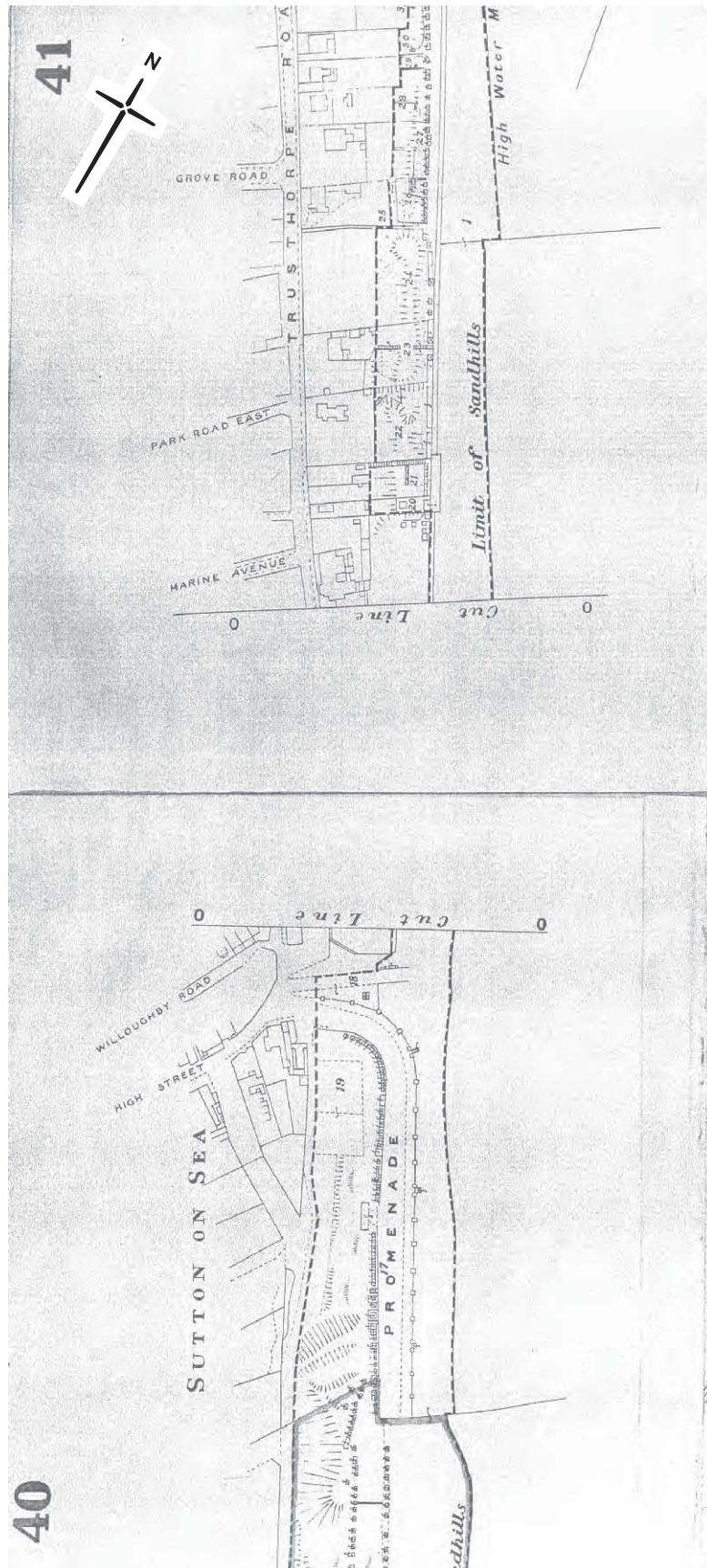


Fig 19.21 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

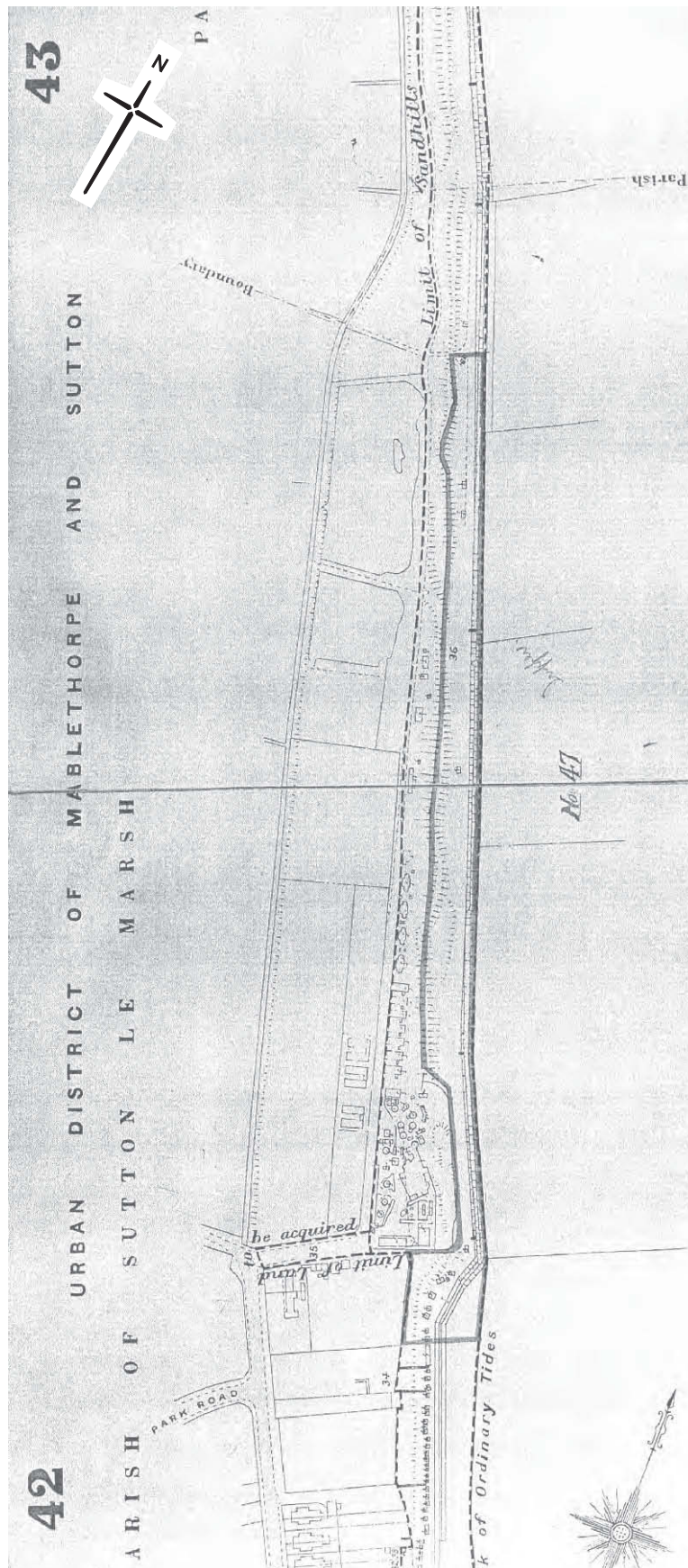


Fig 19.22 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

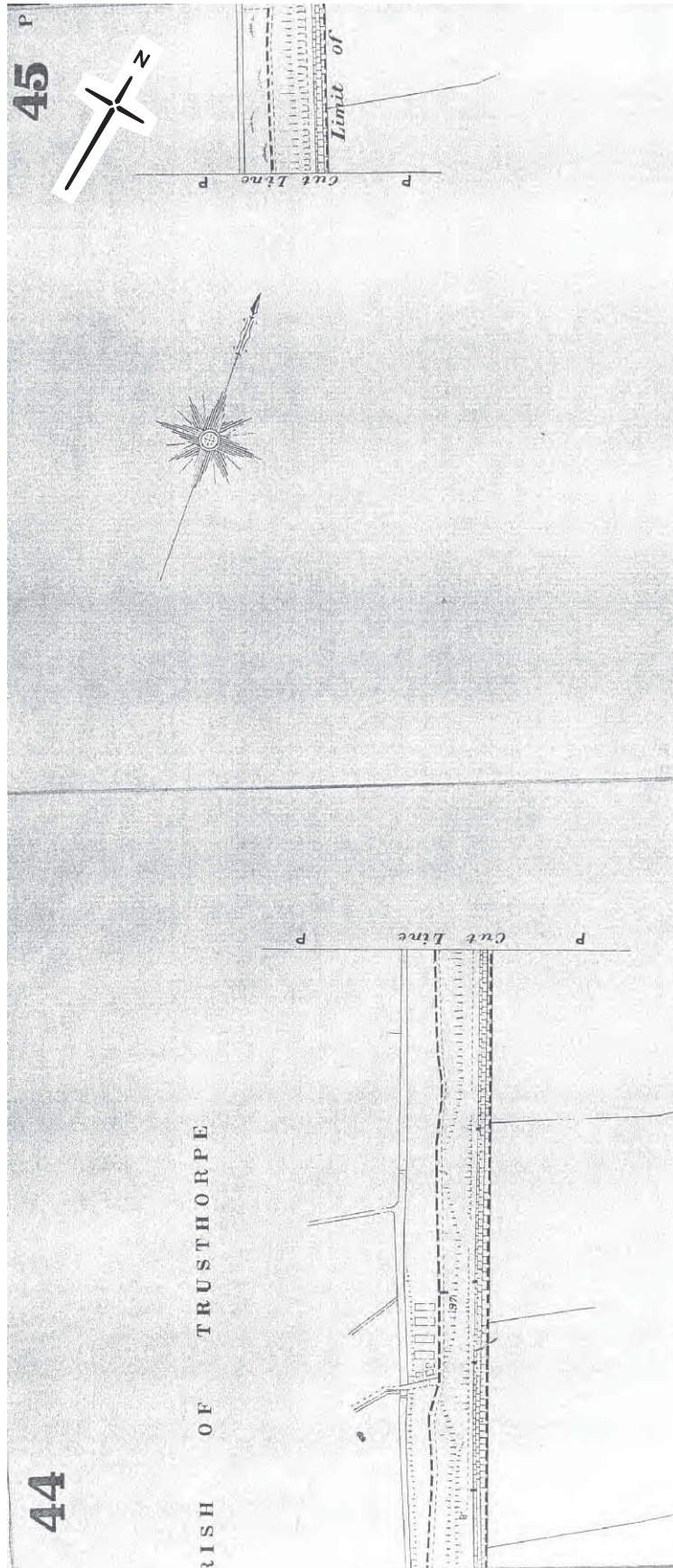


Fig 19.23 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

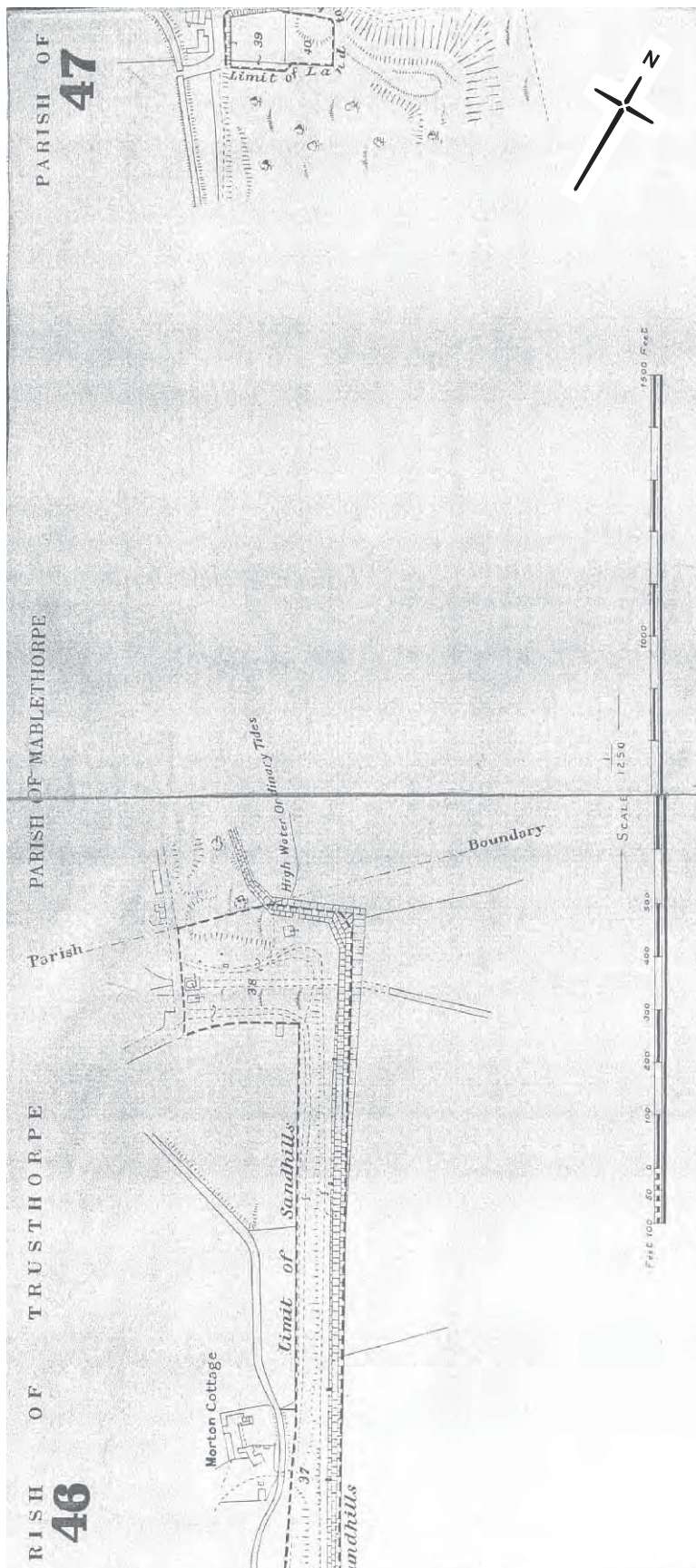


Fig 19.24 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25

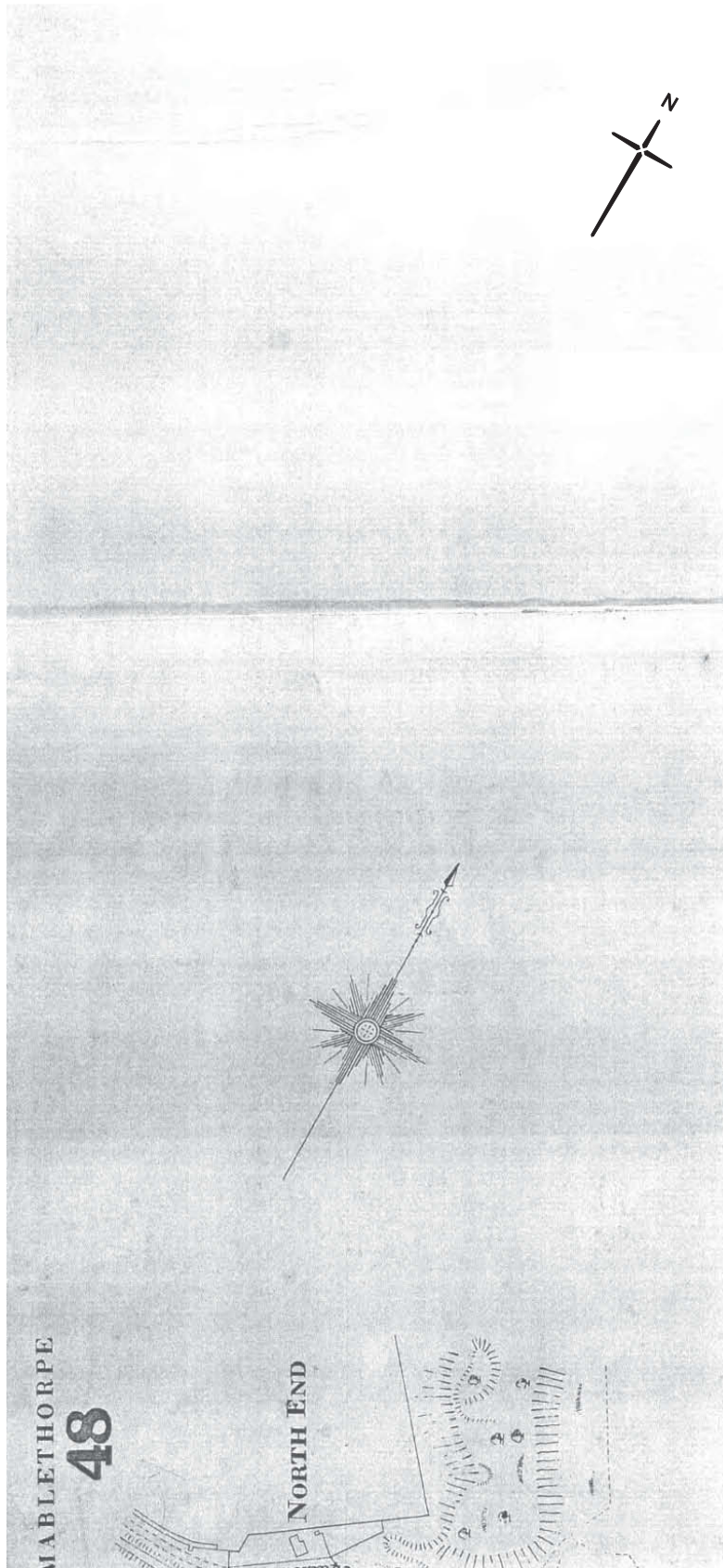


Fig 19.25 Map of coastal strip, 1937, Skegness to Mablethorpe, sheets 1-25



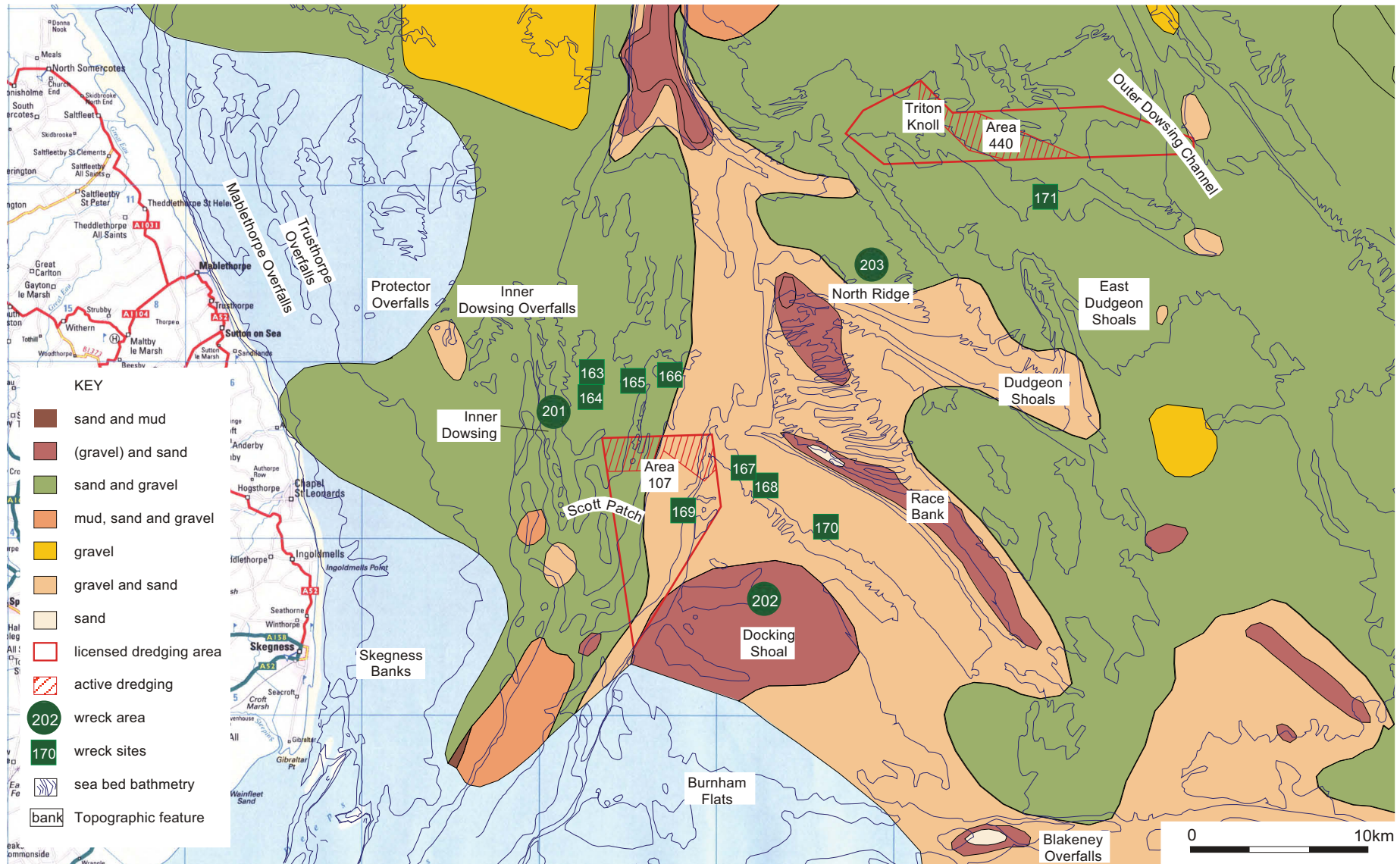


Fig 20 Sea bed bathymetry, geology, sediments, and NMR findspots/monuments in vicinity of licensed dredging areas 107 and 440

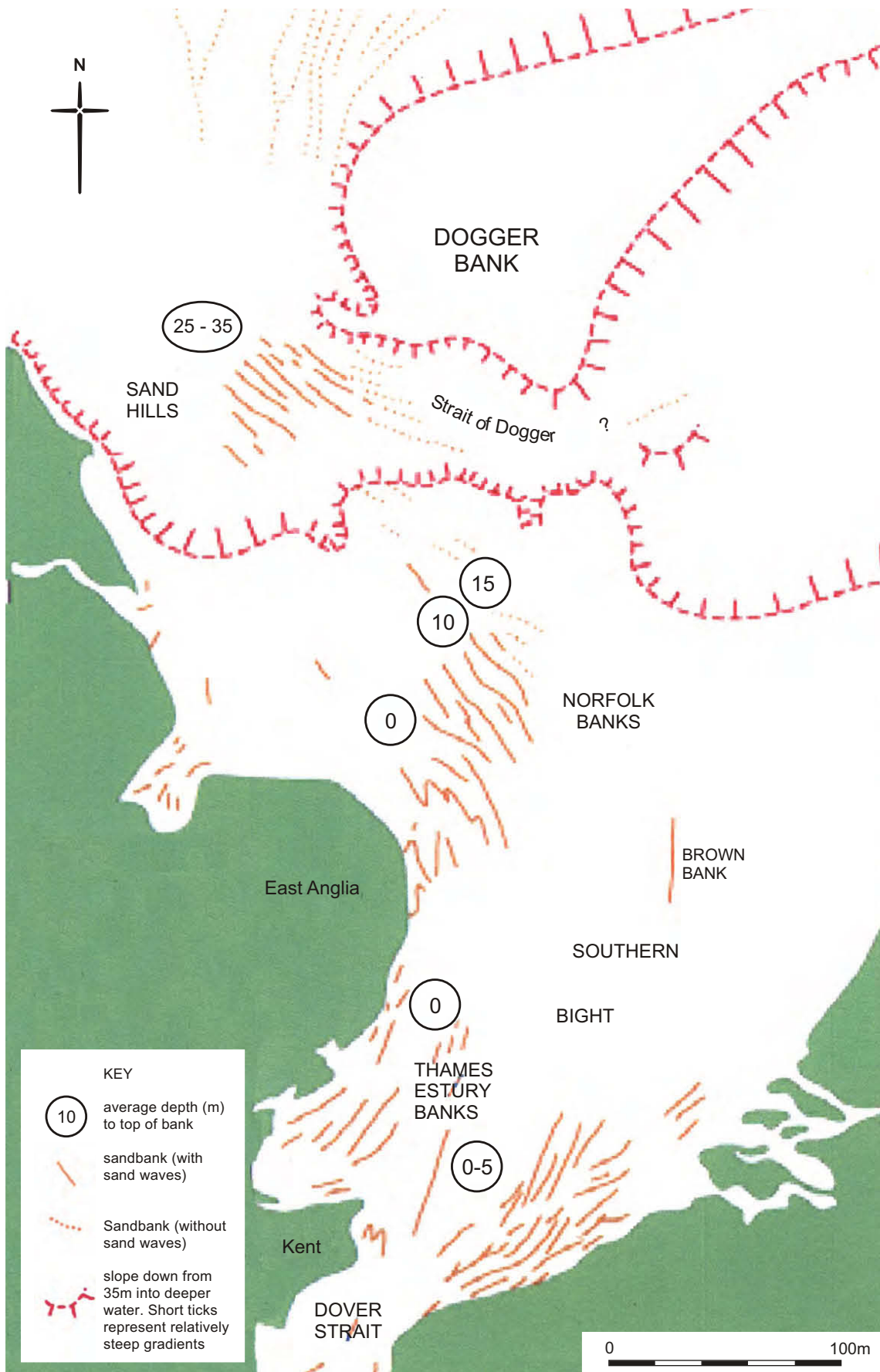


Fig 21 Map showing offshore sand banks, notably Dogger Bank, in south-western part of the North Sea (after Fleming 2002)



Fig 22 Fossils from the bottom of the North Sea, collected from Dogger Bank area (van Kolfschoten and van Essen 2004)

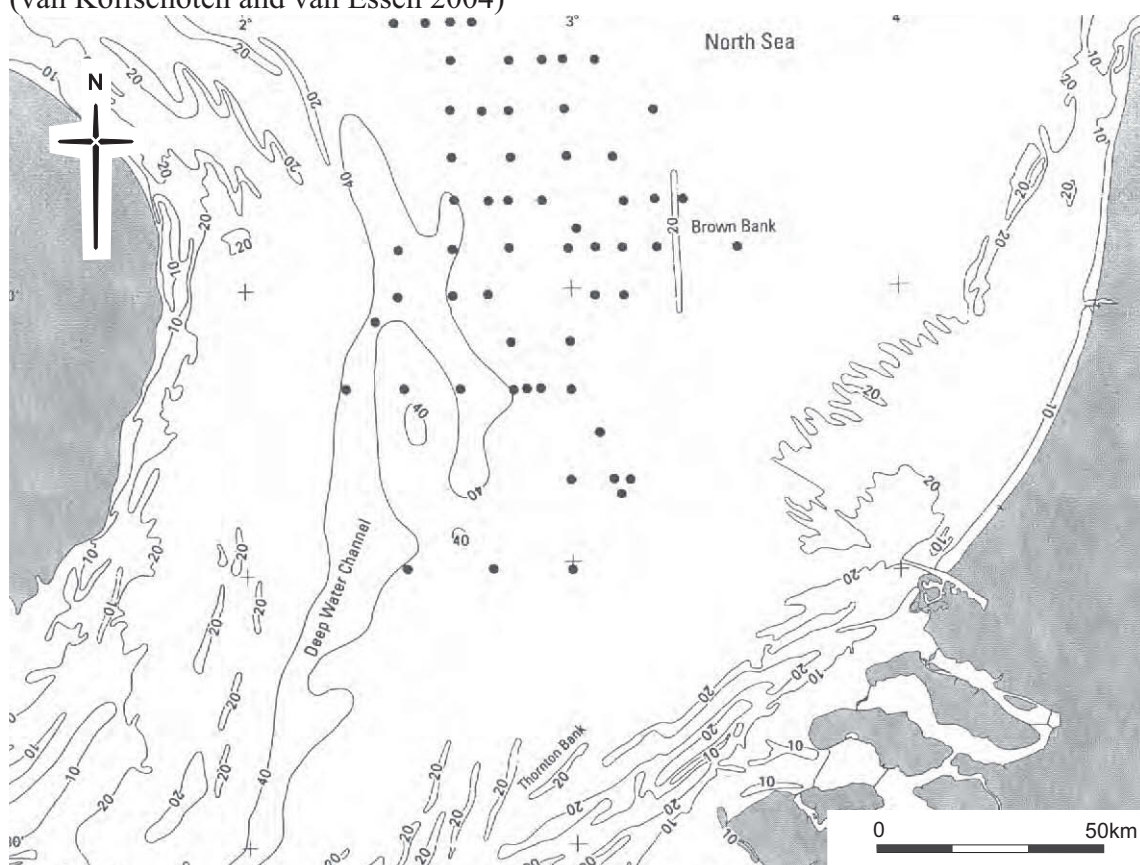


Fig 23 Map showing locations of mammal fossil concentrations in area of Brown Bank (after Drees 1986, based on unpublished data by J Mulder) (van Kolfschoten and van Essen 2004)

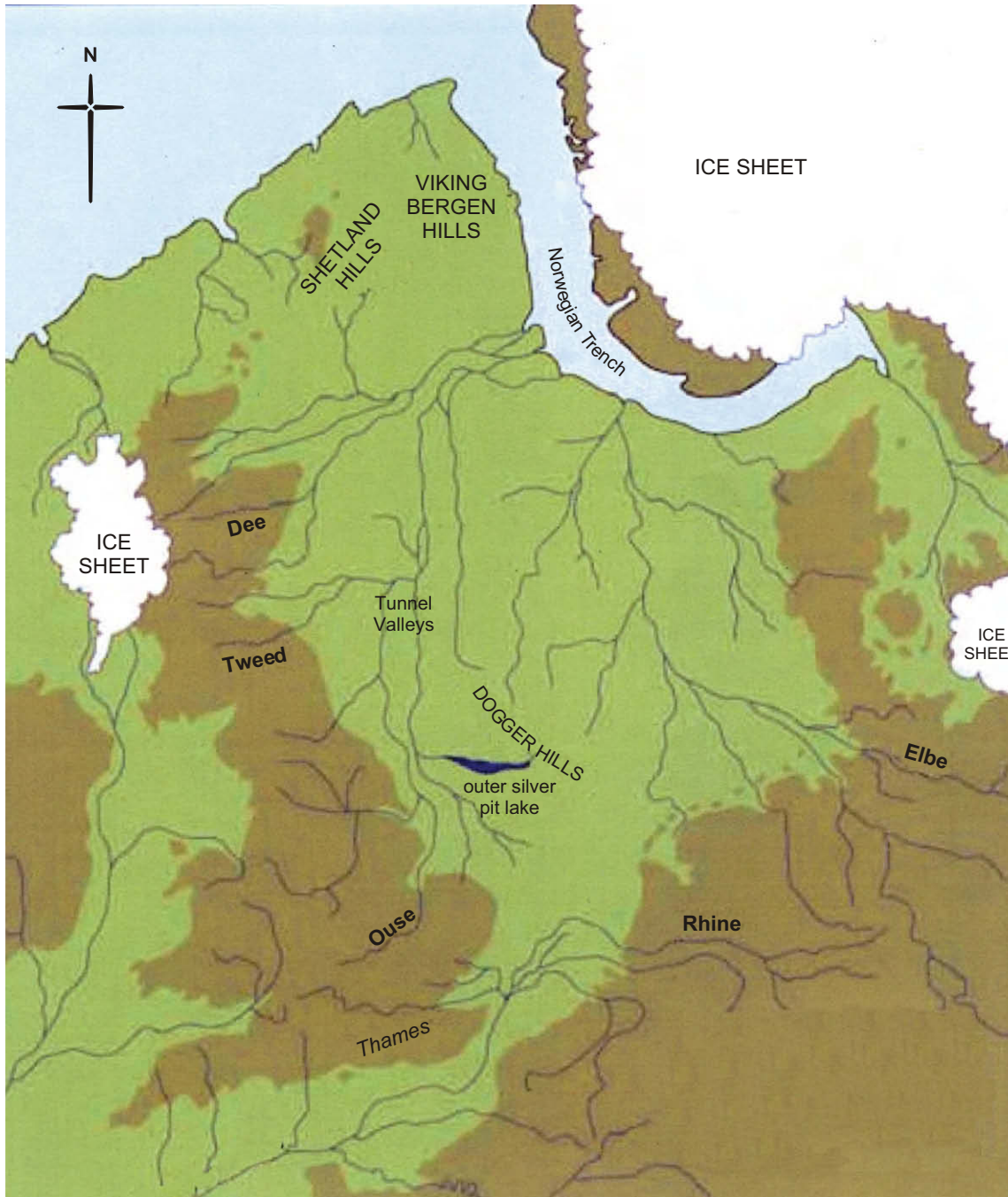


Fig 24 Map showing extent of dry land and river courses in North Sea basin at the end of Devensian period (after Fleming 2002)

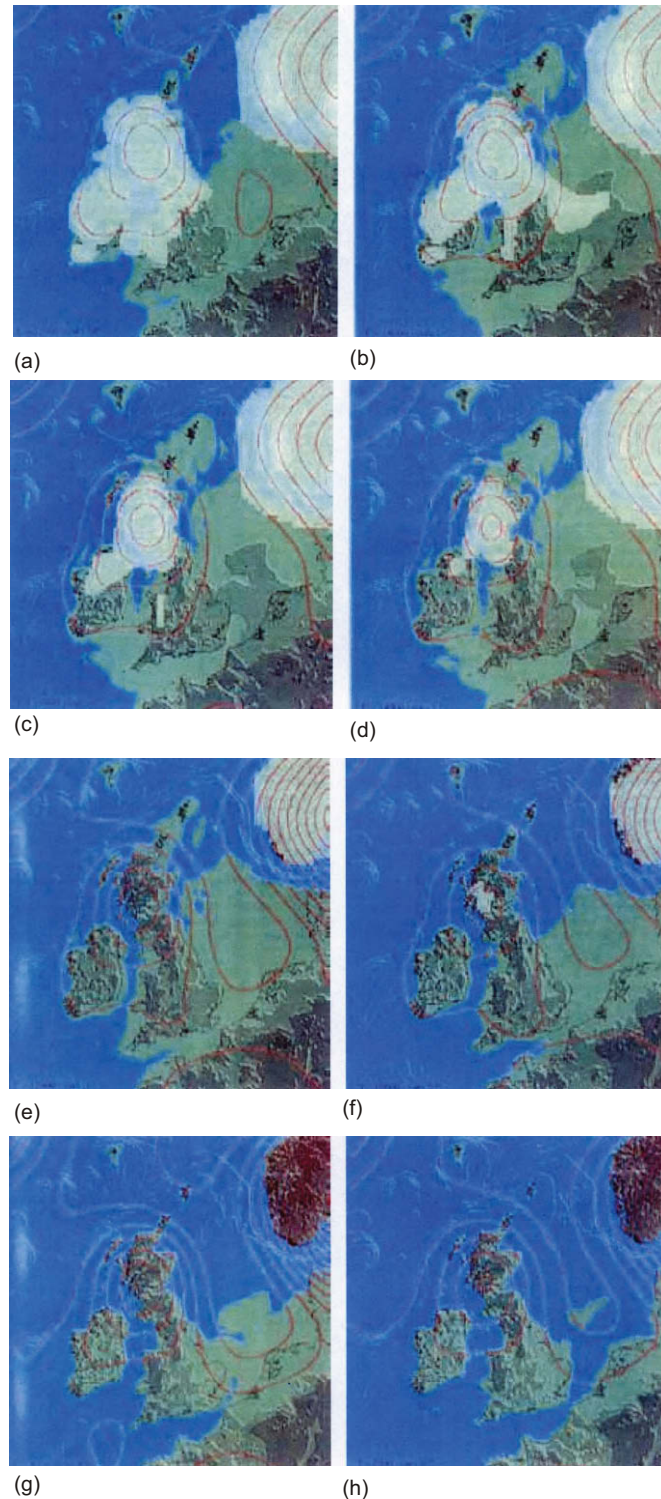


Fig 25 Isobase maps of predicted shorelines, shoreline locations and ice sheet limits for selected epochs. (a) 22,000 years BP corresponding to the adopted time of maximum glaciation over the British Isles, (b) 18,000 years BP corresponding to the time of deglaciation of large ice sheets, (c) 16,000 years BP, (d) 14,000 years BP, (e) 12,000 years BP, (f) 10,000 years BP, (g) 8,000 years BP, (h) 7,000 years BP. The maximum ice heights for these epochs are : 1,500m at the time of glacial maximum at 22,000 years BP, 1,400 m at 18,000 years BP, 1,300m at 16,000 years BP, 1,000m at 14,000 years BP and 400m at 10,000 years BP. Palaeowater depths are also indicated with contours at 50, 100, 150 and 200m. Isobase contour intervals are 50m for (a) to (d), 25m for (e) and (f) and 10m for (g) and (h) (after Lambeck 1995)

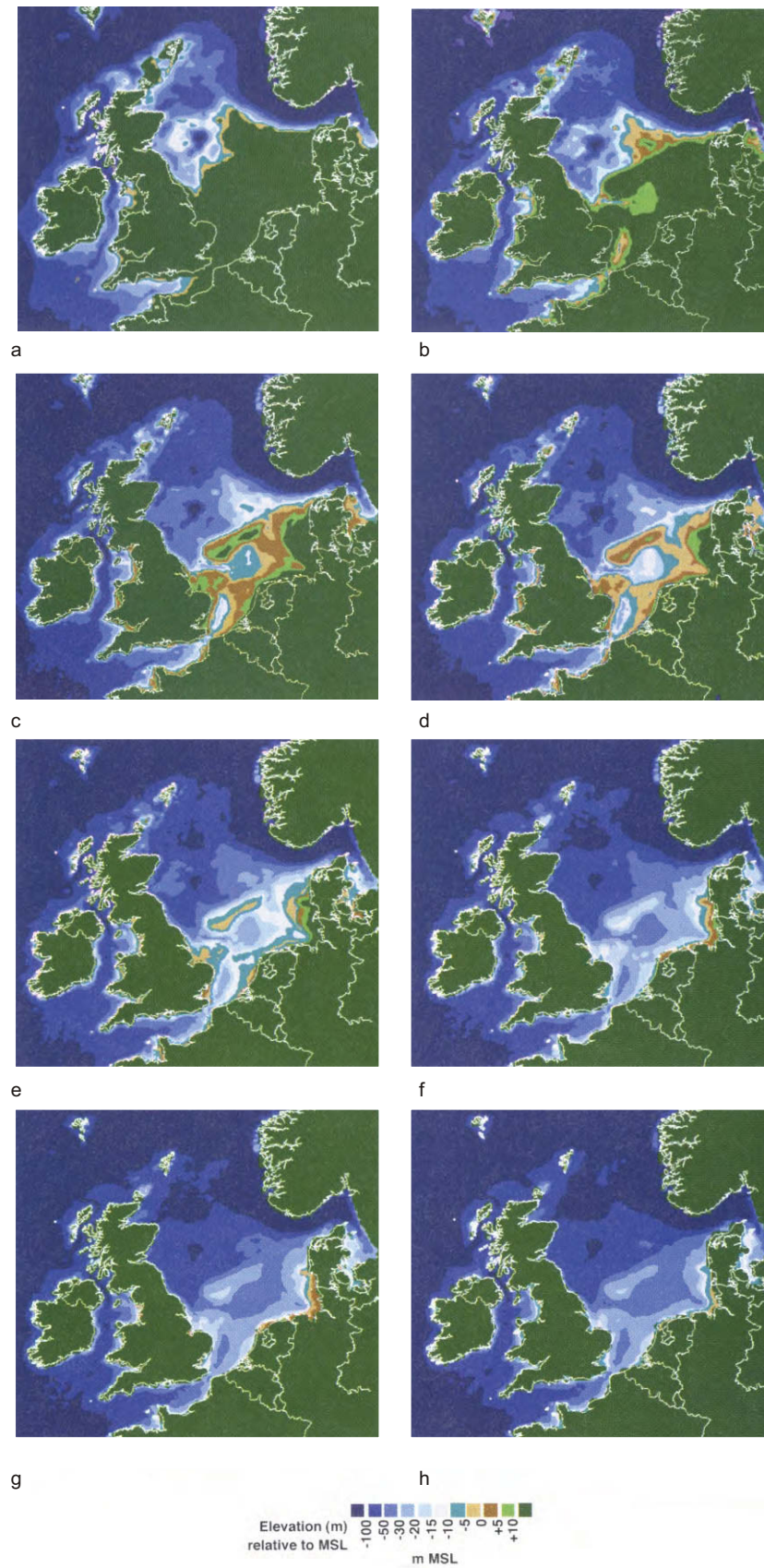


Fig 26 Palaeogeographic reconstructions of north-western Europe, showing coastal extents during the Mesolithic period: (a) 10,000 years BP, (b) 9,000 years BP, (c) 8,000 years BP, (d) 7,500 years BP, (e) 7,000 years BP (f) 6,000 years BP, (g) 5,000 years BP and (h) 4,000 years BP (after Shennan 2000)

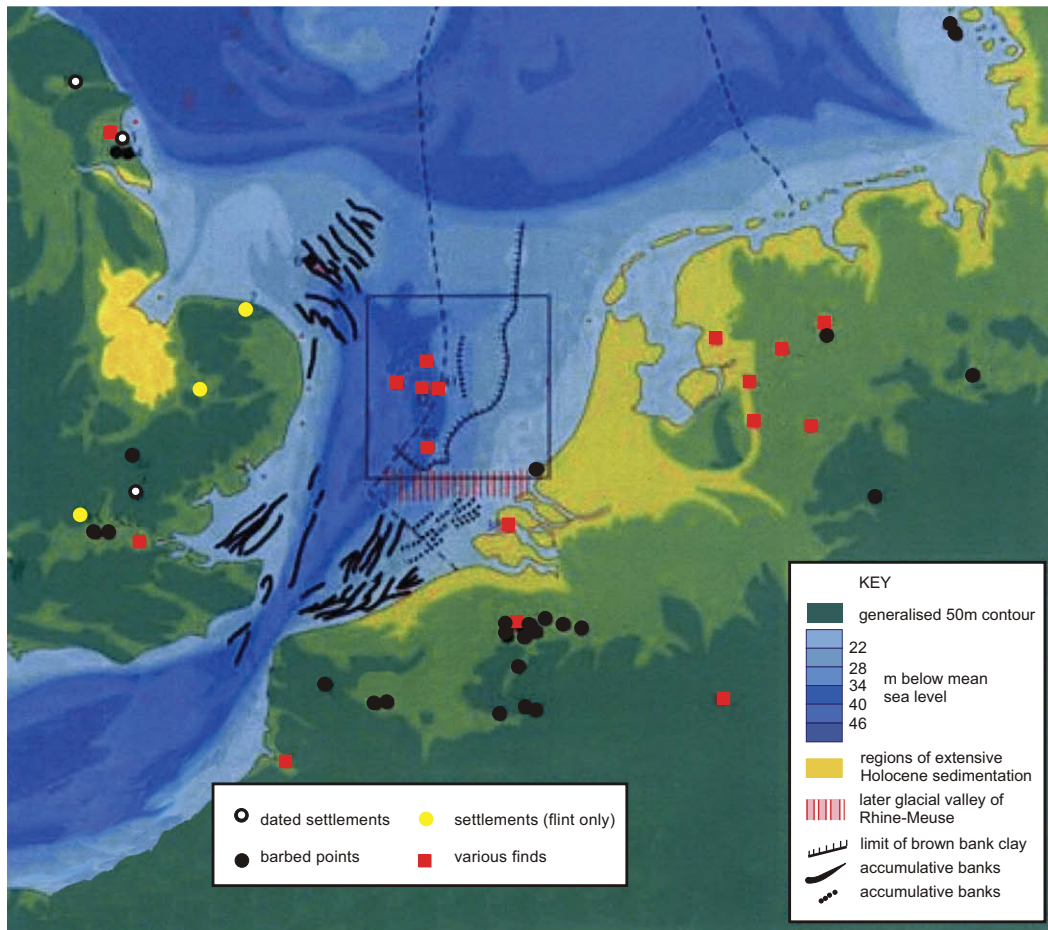


Fig 27 Map showing known areas of potential, in a southern North Sea, for survival submarine prehistoric archaeological deposits (after Fleming 2002)



Fig 28 Map of the North sea basin showing areas of shallow water, which are the areas of highest potential for prehistoric human habitation (after Long et al 2004)

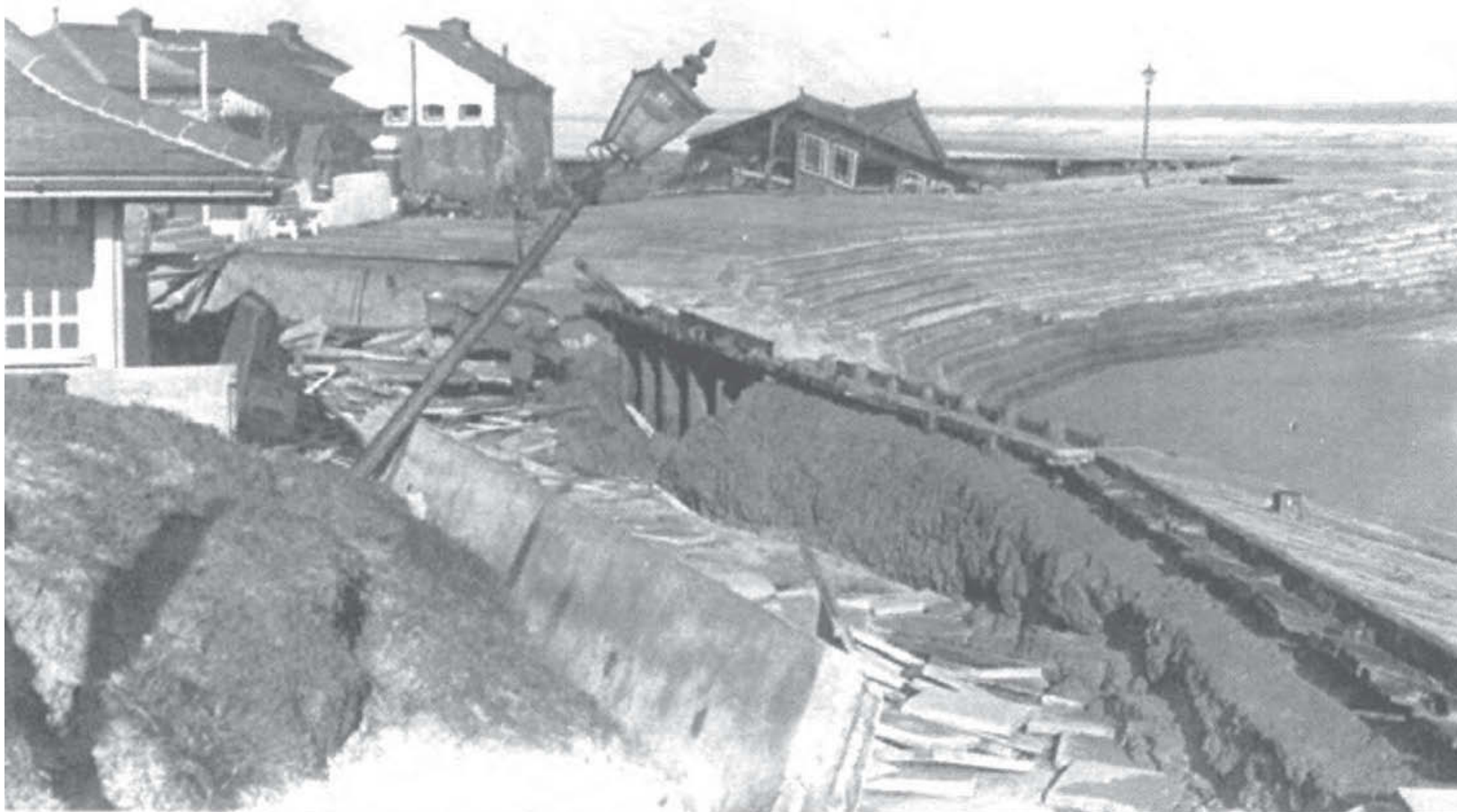


Fig 29 Mablethorpe beach after the storm surge of 1953 (Environment Agency 2004)



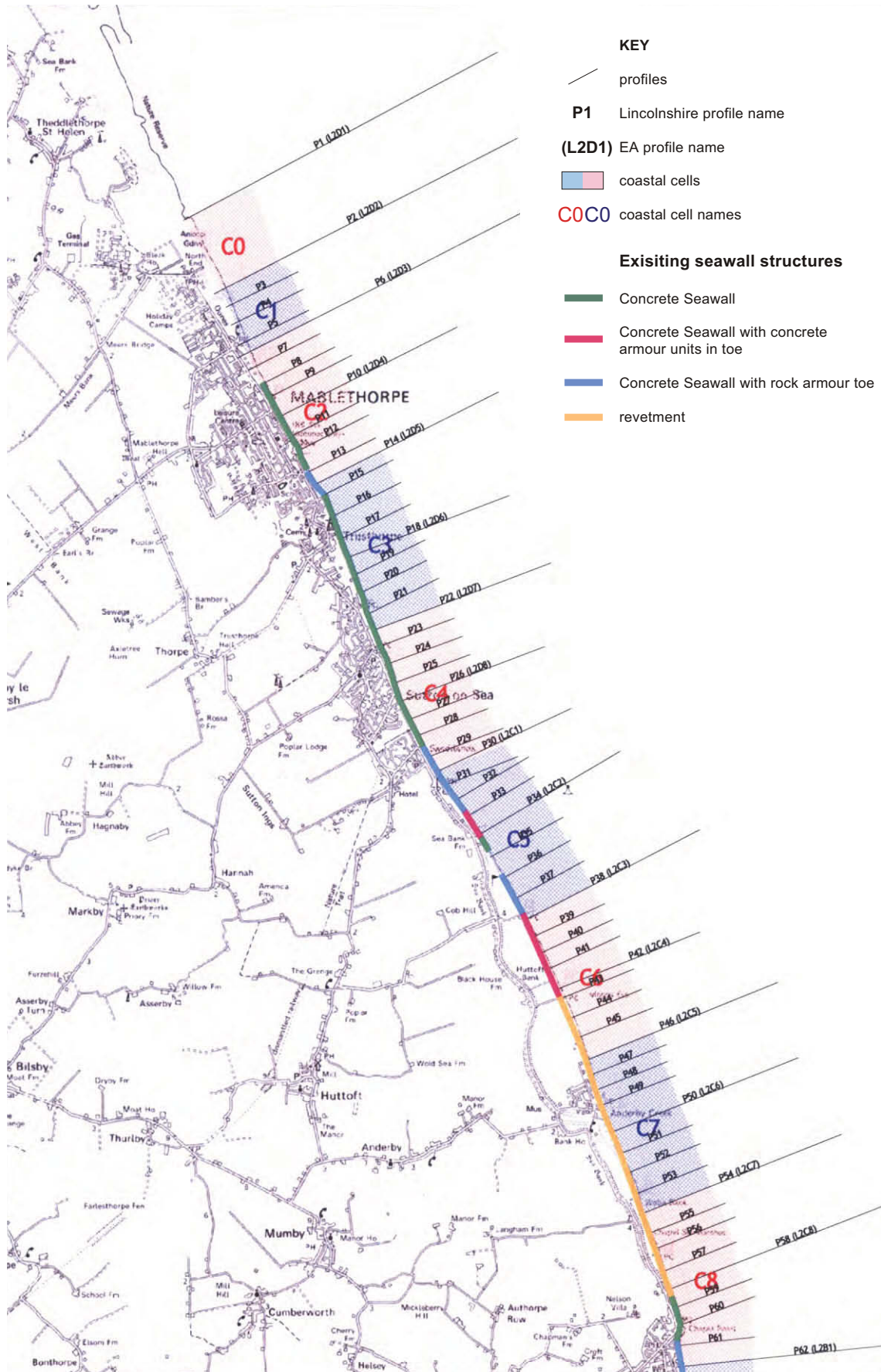


Fig 31.1 Plan of existing coastal defences, showing profile locations, coastal cells and existing seawall structures (Environment Agency 2004)

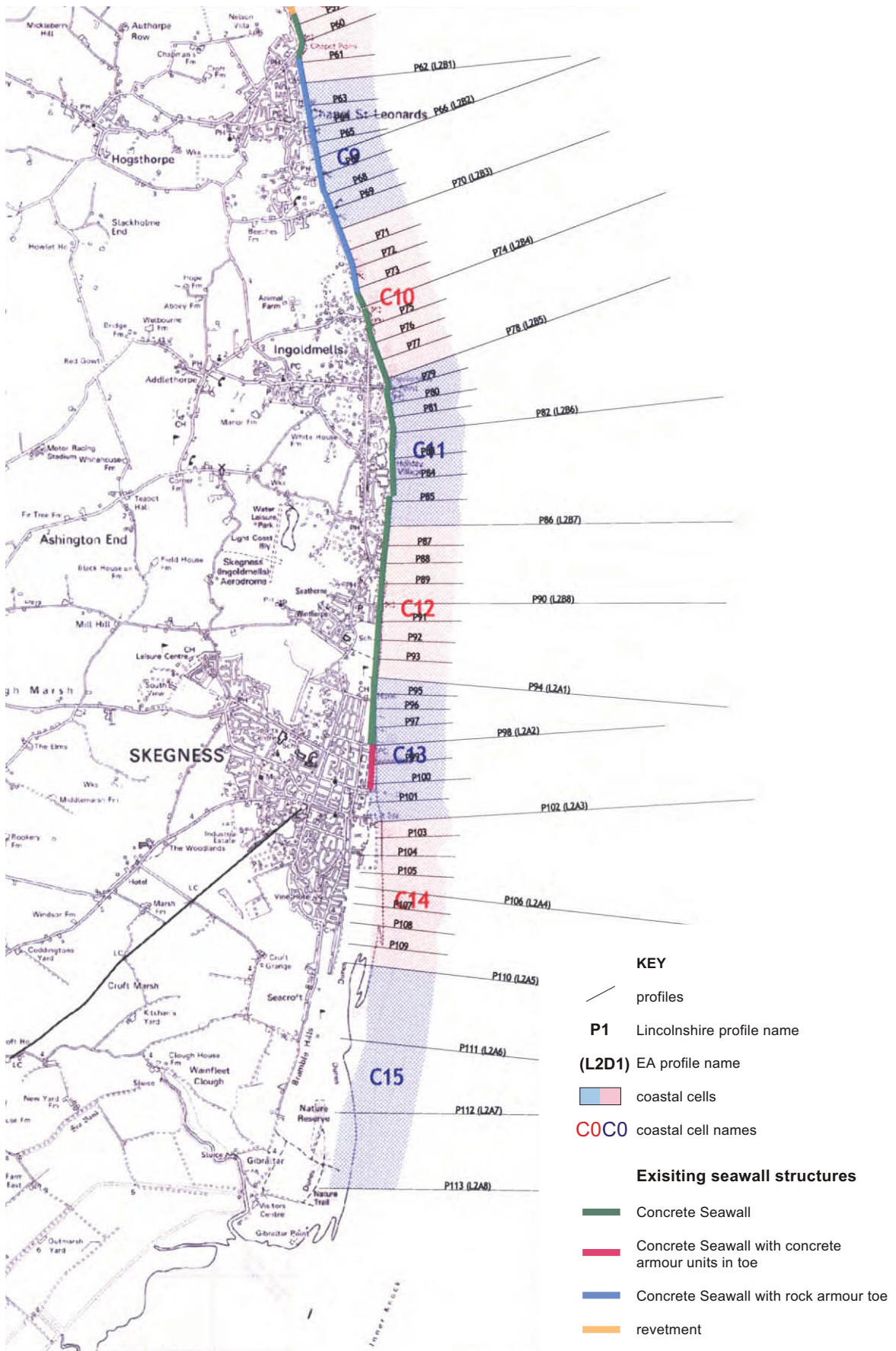


Fig 31.2 Plan of existing coastal defences, showing profile locations, coastal cells and existing seawall structures (Environment Agency 2004)

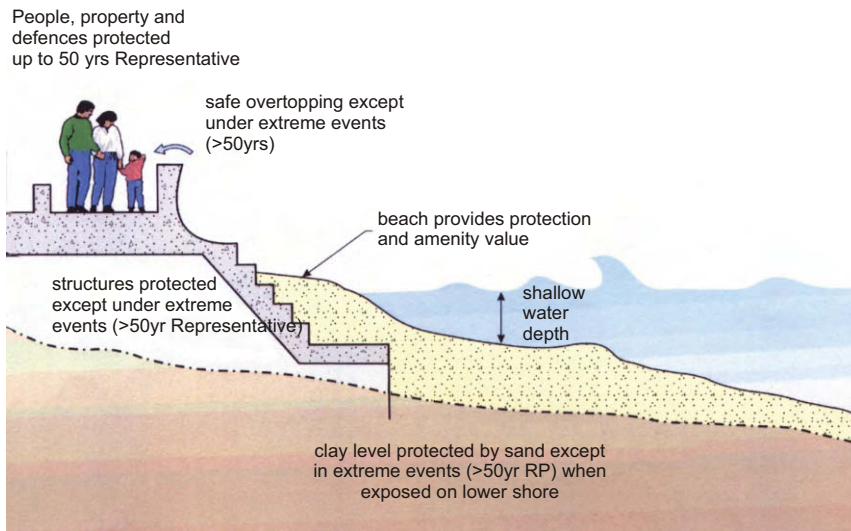


Fig 32 Cross section of Lincolnshire beach, showing how replenishment improves the beach (Environment Agency 2004)

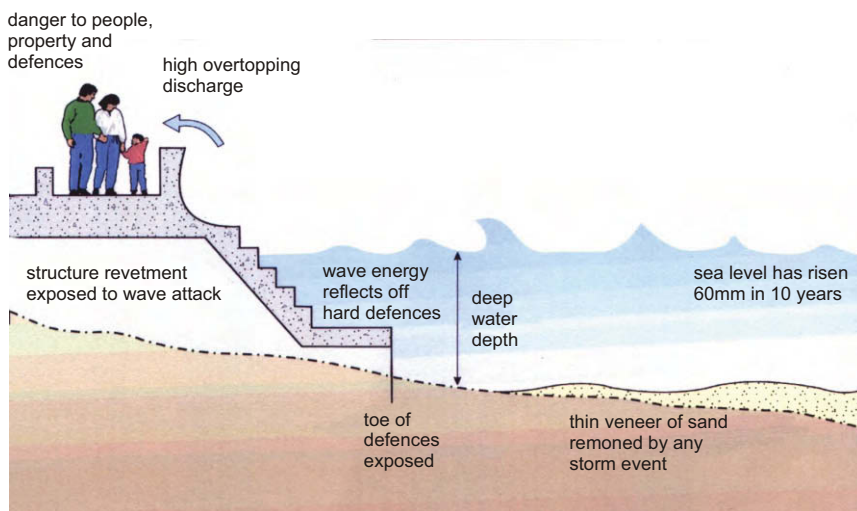


Fig 33 Cross-section showing damage that coastal erosion will do if beaches are not replenished after 10 years (Environment Agency 2004)

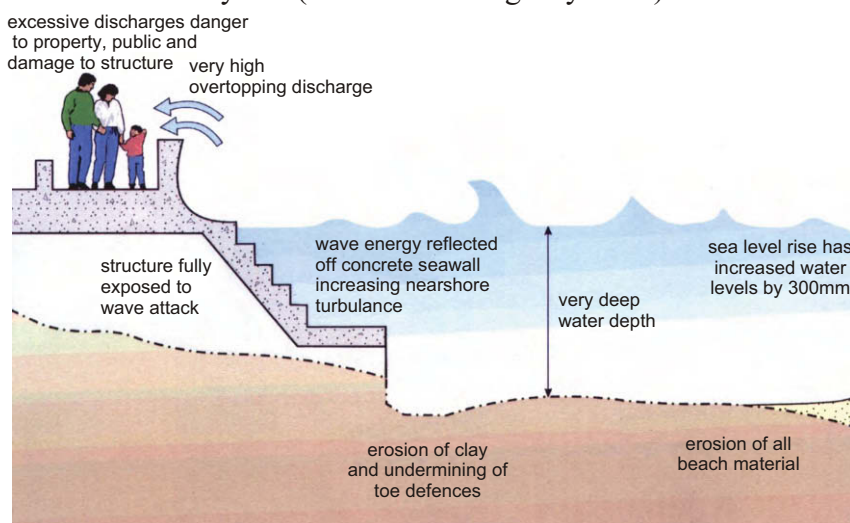


Fig 34 Cross section showing damage that coastal erosion will do if not replenished after 50 years (Environment Agency 2004)

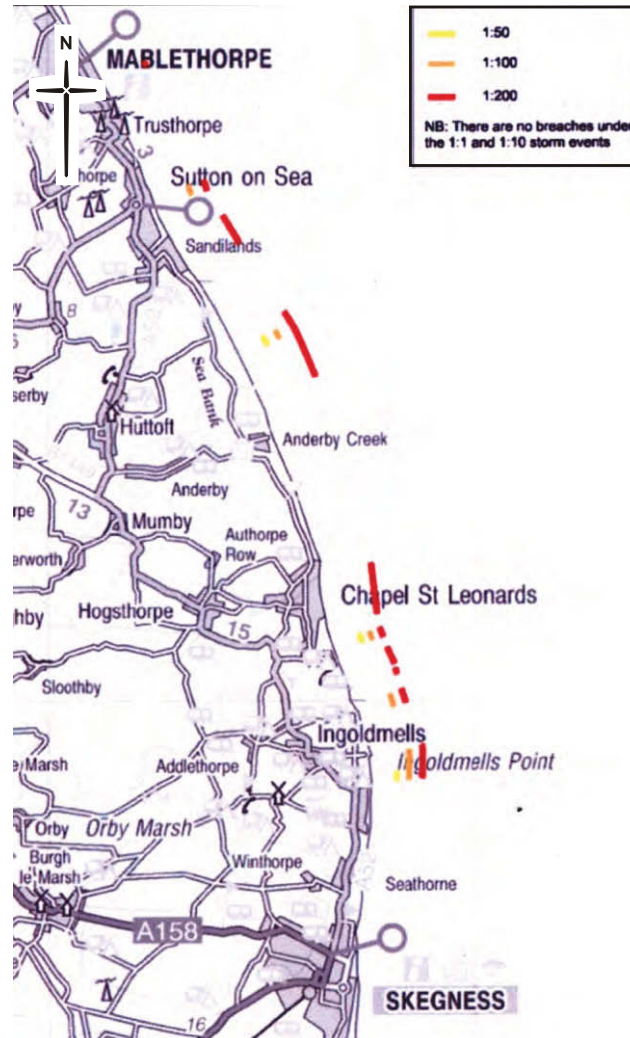


Fig 35 Location of defences at risk under a 1:50, 1:100 and 1:200 year storm event (Environment Agency 2004)

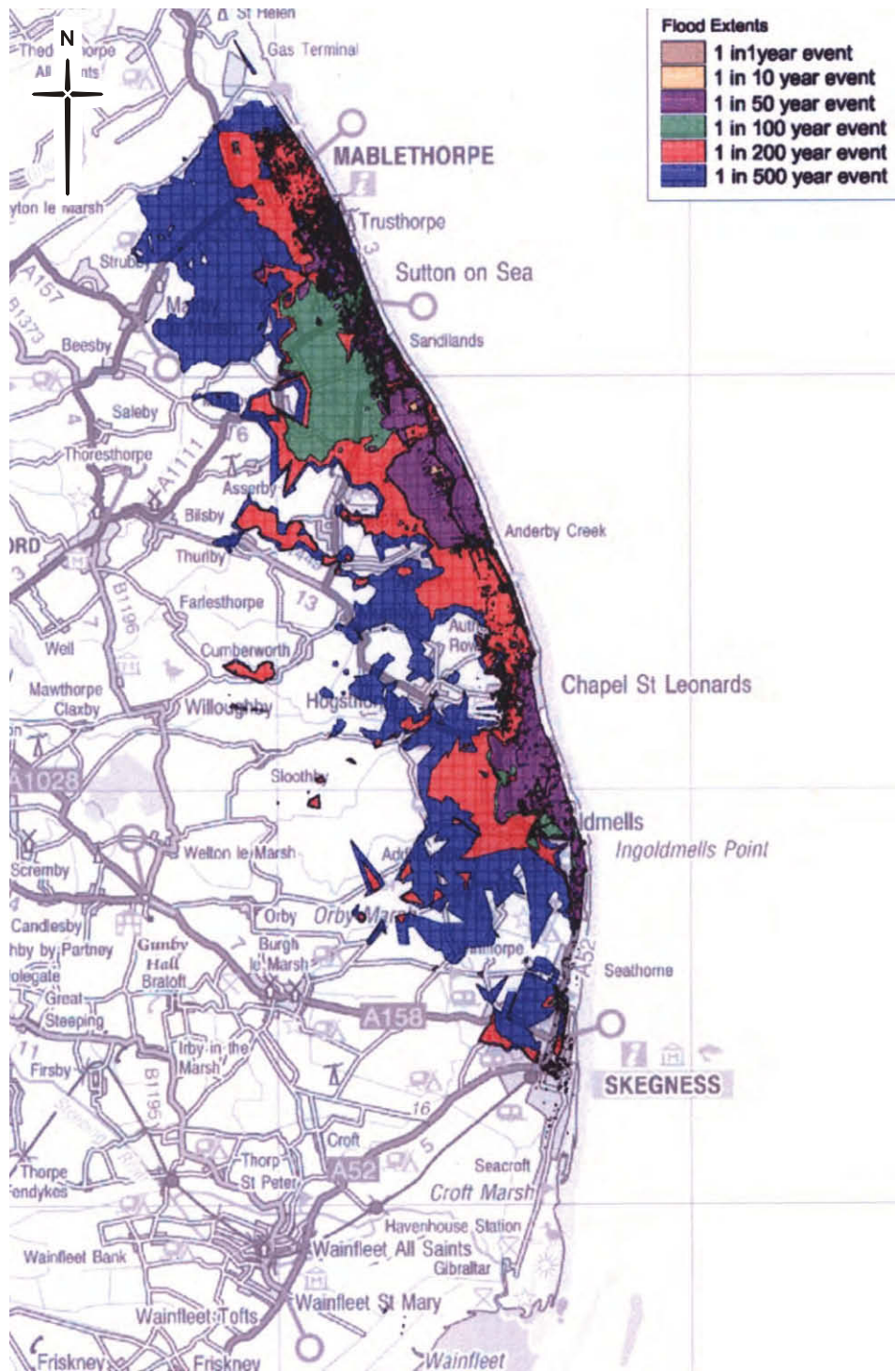


Fig 36 Extent of flood risk zones, if no action taken (Environment Agency 2004)



Fig 37 Trusthorpe beach prior to renourishment in 1994 (Environment Agency 2004)



Fig 38 Trusthorpe beach after renourishment (Environment Agency 2004)



Fig 39 Re-colonisation of Chapel Six Marshes following renourishment (Environment Agency 2004)



Fig 40 Image of renourished beach at low water, looking north from Vickers point (Environment Agency 2004)



Fig 41 Image of renourished beach at Anderby Creek (Environment Agency 2004)



Fig 42 Image of renourished beach at Gibraltar point (Environment Agency 2004)

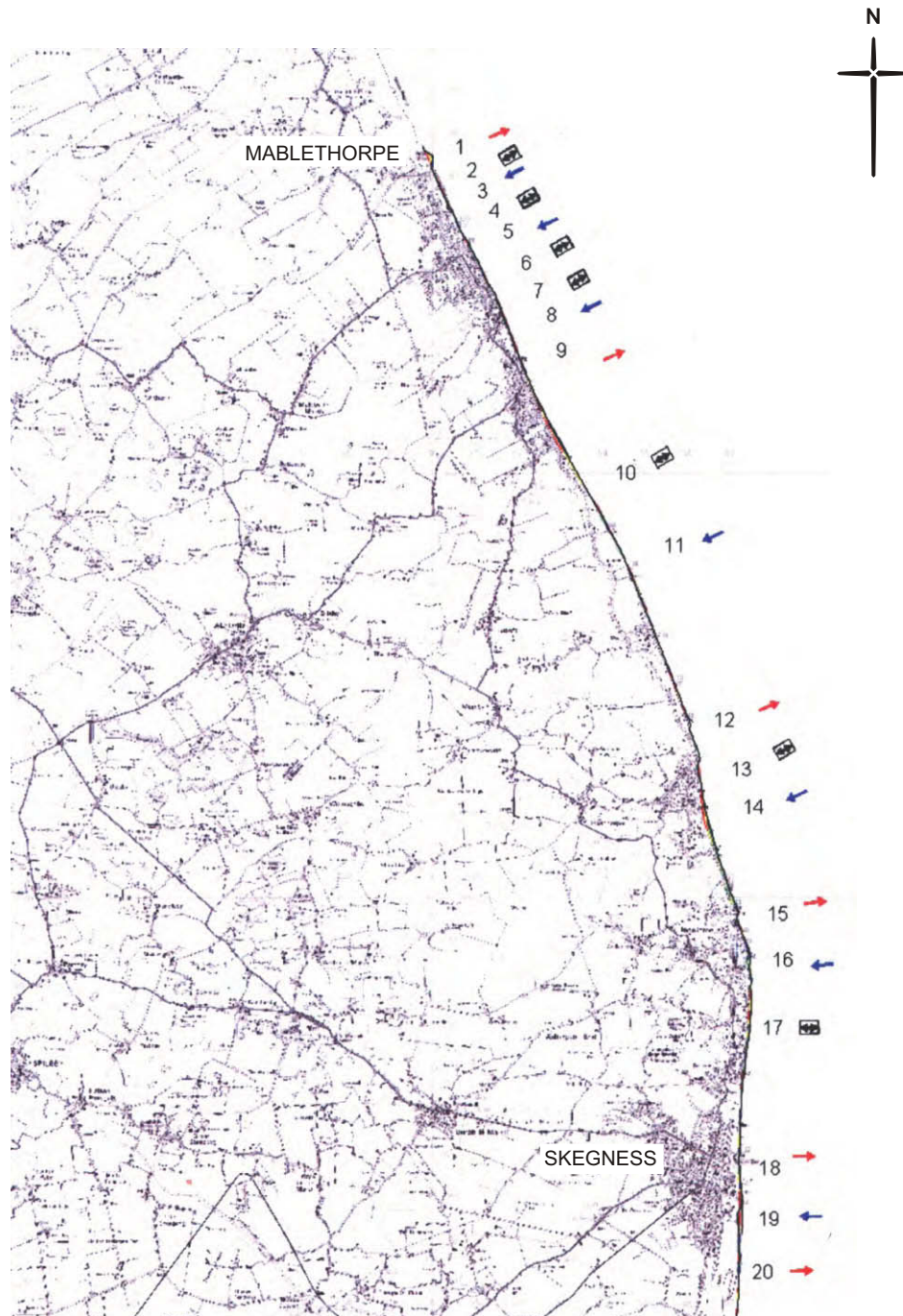


Fig 43 Potential shoreline change predicted for Lincolnshire coast (Environment Agency 2004)



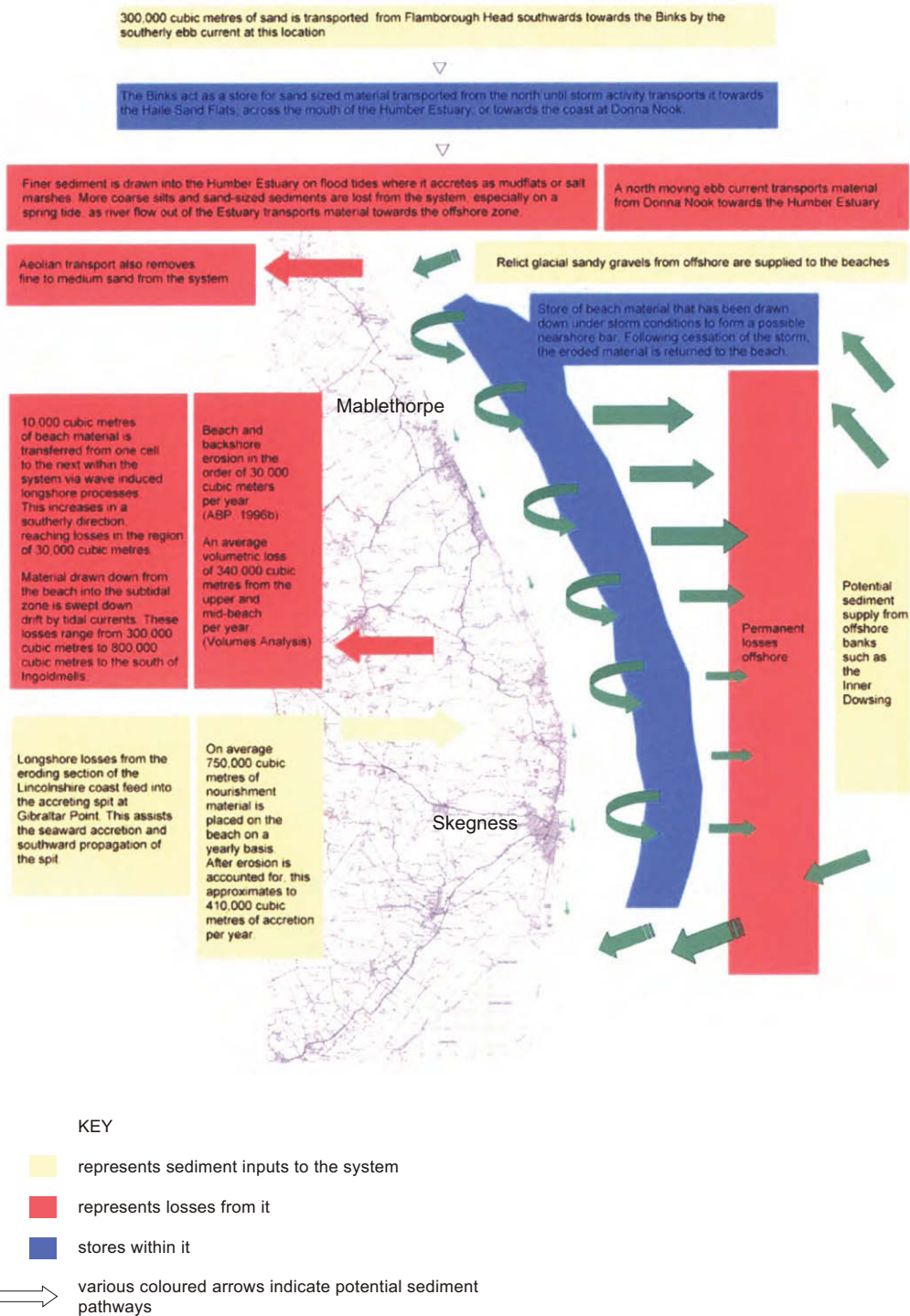


Fig 44 Conceptual model showing coastal processes at work on Lincolnshire coast (Environment Agency 2004)

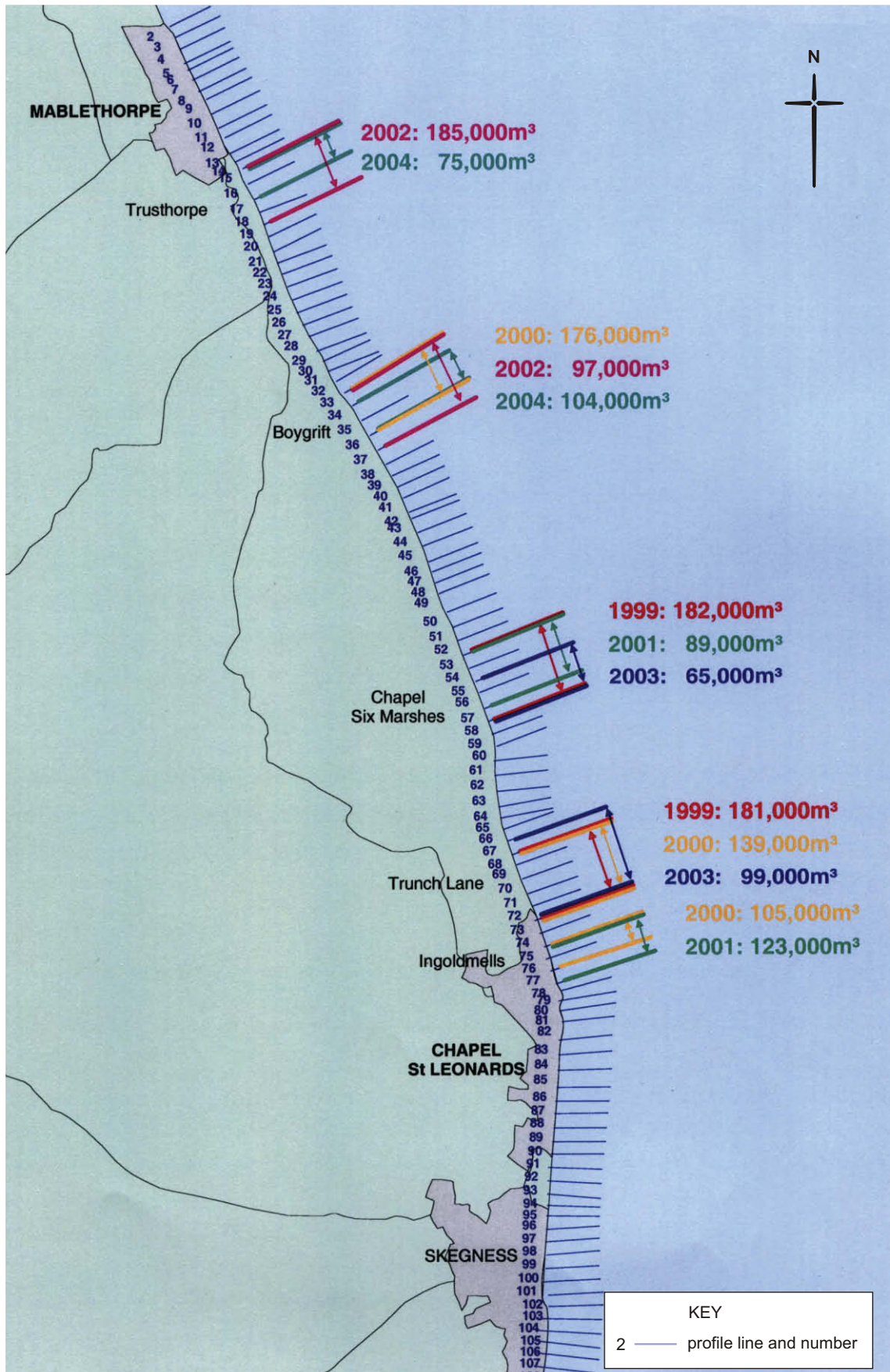


Fig 45 Locations and volumes of beach recharge between 1999 and 2004 (Environment Agency 2004)