

## Appendix: List of Managed Realignment Projects in Europe

Existing managed realignment projects in Europe are listed below alphabetically per country and indicating the geographical location, method of implementation, year of project completion and project size. Note that few projects are listed for the USA, but the list is not intended to be comprehensive. The objective is to demonstrate that, although not widely recognised as managed realignment, some initiatives outside Europe fit the wider definition used in this book.

This list was produced based on evidence from existing literature and online sources, especially the Online Managed Realignment Guide<sup>1</sup> (OMReG). The OMReG provides a useful list of the managed realignment projects in Europe and their main characteristics. In February 2013, it listed a total of 102 projects in Europe, half of which in the UK. Information about the implementation of managed realignment projects is scattered and not always readily available. Some missing entries and inconsistencies found in the OMReG are corrected in the list provided here, which includes projects already implemented or under construction (as of February 2014). An online map of managed realignment projects in the UK is available from <http://binged.it/1fFF9pF>. This resource is intended to be regularly updated and include projects in other countries in the future, providing up-to-date information about managed realignment projects.

For some of the projects listed in OMReG, no other source of information was found during the research conducted for the production of this book. Some projects, especially in the UK, Belgium, Netherlands and France, are documented in the grey literature and, a selected few, also in scientific publications. The main source of information for each project listed below is identified as a footnote (note that more sources might exist for some projects); when a footnote is missing, the OMReG is the main source of information.

Site name	Location	Method	Year	Area (ha)
<i>Belgium</i>				
Bergenmeersen <sup>a</sup>	Scheldt	Controlled tidal restoration—CRT	Works started in 2013	41
Dijlemondig <sup>b</sup>	Dijle estuary	Controlled tidal restoration—CRT	Works started in 2013	207

<sup>1</sup> The OMReG is an online catalogue (<http://www.abpmer.net/omreg/>) about managed realignment produced by ABPmer, a private environmental consultancy based in Southampton, UK.

Site name	Location	Method	Year	Area (ha)
Hedwige-Prosper <sup>59</sup>	Scheldt	Realignment of defence	Works started in 2010	465
Heusden <sup>c</sup>	Scheldt	Breach of defence	2006	10
Kalkense Meersen <sup>59</sup>	Scheldt	Realignment of defence	Works started in 2013	606
Ketenisse schor <sup>60</sup>	Scheldt	Realignment of defence and land lowering	2003	60
Lippenbroek <sup>59,d,e</sup>	Scheldt	Controlled tidal restoration—CRT	2006	10
Paardebroek <sup>60</sup>	Scheldt	Realignment of defence	Works started in 2013	28
Paardenschor <sup>60</sup>	Scheldt	Realignment of defence and land lowering	2004	12
Paddebeek <sup>60</sup>	Scheldt	Realignment of defence	2003	1.6
Polders of Kruikebe <sup>59</sup>	Scheldt	Realignment of defence and controlled tidal restoration—CRT	Works started in 2013	650
Vlassenbroek and Wal-Zwijn <sup>59</sup>	Scheldt	Realignment of defence and controlled tidal restoration—CRT	Works started in 2012	416
Wijmeers 1 <sup>58</sup>	Scheldt	Realignment of defence	Works started in 2013	159
Wijmeers 2 <sup>58</sup>	Scheldt	Realignment of defence	Works started in 2013	28
Yzer mouth	Yzer	Removal of defence	2001	50
<i>Denmark</i>				
Geddal Strandenge	Limfjord	Breach of defence	1992	140
Viggelsø	Odense Fjord	Breach of defence	1993	66
<i>France</i>				
Aber de Crozon <sup>f</sup>	Crozon	Removal of defence	1981	87
Île Nouvelle <sup>g</sup>	Gironde estuary	Breach of defence	2000	265
Polder de Sébastopol <sup>h</sup>	Ile de Noirmouthier	Controlled tidal restoration	1999	132
Sète-Marseillan <sup>i</sup>	Languedoc-Roussillon	Managed retreat	2010	?
<i>Germany</i>				
Anklamer Stadtbruch	Oderhaff	Breach of defence	2004	1750
Beltringharder Koog <sup>j</sup>	North Friesland	Controlled tidal restoration	1988	853
Billwerder Insel	Elbe estuary	Removal of defence	2008	20
Dorumer Sommerpolder	East Friesland	Removal of defence	2001	4
Hahnöfer Sand	Elbe	Removal of defence	2002	104
Hauener Hooge	Ley Bay	Breach of defence	1994	80
Karrendorfer Wiesen	Greifswald Bodden	Removal of defence	1993	350
Kleinensiel Plate	Weser	Breach of defence	2000	58
Kleines Noor	Flensburg Fjord	Breach of defence	2002	14
Kreetsand <sup>k</sup>	Elbe	Realignment of defence (not yet breached)	1999 and 2012	30
Langeooger Sommerpolder <sup>l</sup>	Island of Langeoog	Removal of defence	2004	215

Site name	Location	Method	Year	Area (ha)
Luneplate	Weser	Controlled tidal restoration	2008	215
Lütetsburger Sommerpolder	Mainland coast of East Friesland	Removal of defence	1982	15
Pepelower/Tessmanner Wiesen	Salzhaff	Breach of defence	2002	120
Polder Freetz	Island of Rügen	Removal of defence	2002	180
Polder Friedrichshagen (Ziesetal)	Greifswald Bodden	Removal of defence	1999	90
Polder Neuensien (Südwestteil)	Island of Rügen	Breach of defence	2002	40
Polder Roggow	Salzhaff	Breach of defence	2002	40
Polder Wehrland	Peenestrom	Removal of defence	2004	113
Riepenburg	Elbe	Removal of defence	1995	1
Rönnebecker Sand	Weser	Breach of defence	2002	34
Salzwiesenprojekt Wurster Küste (Berensch/Spieka-Neufeld)	Mainland coast of East Friesland	Controlled tidal restoration	1995	280
Sommerpolder Wurster Küste	Mainland coast of East Friesland	Breach of defence	2007	145
Spadenländer Spitze	Elbe	Removal of defence	2000	7.5
Strandseenlandschaft Schmoel	Kiel Bay	Breach of defence	1989	40
Tegeler Plate Polder	Weser	Breach of defence	1997	150
Teilpolder Waschow	Peenestrom	Removal of defence	2004	66
Vorder-/Hinterwerder Polder	Weser	Breach of defence	1997	30
Wrauster Bogen	Elbe	Removal of defence	1991	2.2
<i>Netherlands</i>				
Breebaart	Dollard	Controlled tidal restoration—CRT	2001	63
Bunkervallei, de Slufter	Island of Texel	Breach of defence	2002	3
De Kerf	North Holland	Breach of defence	1997	30
Groene Hoek, de Slufter	Island of Texel	Breach of defence	2002	13
Groene Strand	Island of Terschelling	Breach of defence	1996	23
Holwerder Zomerpolder	Mainland coast of Friesland	Breach of defence	1989	28
Klein Profijt	Oude Maas	Breach of defence	2005	6
Kroon's Polders	Island of Vlieland	Realignment of defence	1996	85
Noard Fryslân Bûtendyks	Friesland	Realignment of defence	2001	135
Tiengemetten	Haringvliet	Breach of defence	2007	500
<i>Spain</i>				
Marismas de la Vega de Jaizubia	Bidasoa estuary	Removal of defence	2004	23

Site name	Location	Method	Year	Area (ha)
<i>UK</i>				
Abbotts Hall <sup>m</sup>	Blackwater	Controlled tidal restoration	1996	84
Alkborough <sup>n</sup>	Humber	Breach of defence	2002	84
Alnmouth 1	Aln	Breach of defence (2 adjacent areas, one beach in each)	2006	8
Alnmouth 2	Aln	Breach of defence	2008	20
Amble Marshes <sup>o</sup>	Camel	Controlled tidal restoration	2010	56
Annery Kiln	Torridge	Breach of defence	2000	3.8
Barking Creek <sup>p</sup>	Barking Creek	Removal of defence	2006	0.3
Barking tidal barrier <sup>c</sup>	Barking Creek	Breach of defence	2006	1.0
Black Devon Wetlands <sup>q</sup>	Forth/Black Devon	Controlled tidal restoration	2000–2005	28
Black Hole Marsh	Axe	Controlled tidal restoration	2009	6
Bleadon Levels	Axe	Breach of defence	2001	13
Brancaster West Marsh <sup>r</sup>	North Norfolk	Realignment of defence	2002	7.5
Brandy Hole	Crouch	Breach of defence	2002	12
Chalkdock Marsh	Chichester Harbour	Controlled tidal restoration	2000	3.2
Chowder Ness <sup>s</sup>	Humber	Realignment of defence	2006	15
Clapper Marshes <sup>b</sup>	Camel	Controlled tidal restoration	2004–2011	10
Cone Pill	Severn	Breach of defence	2001	50
Devereux Farm <sup>t</sup>	Hamford Water	Breach of defence	2010	6
Freiston <sup>u</sup>	The Wash	Realignment of defence	2002	66
Glasson	Conder	Controlled tidal restoration	2005	6.4
Goswick Farm <sup>b</sup>	South Low River	Controlled tidal restoration	2010	4.5
Halvergate	Yare	Realignment of defence	2005	5
Havergate Island	Ore	Realignment of defence	2000	8.1
Hesketh Out Marsh <sup>v</sup>	Ribble Estuary	Realignment of defence	2008	168
Horsey Island	Hamford Water	Controlled tidal restoration	1995	1.2
Kennet Pans <sup>w</sup>	Firth of Forth	Realignment of defence	2008	8.2
Lepe/Darkwater <sup>x</sup>	Dark Water	Controlled tidal restoration	2007	5
London Gateway Wildlife Reserve	Thames	Realignment of defence	2010	27
Lower Clyst (Goosemoor) <sup>y</sup>	Exe estuary	Controlled tidal restoration	2004	6.2
Man Sands <sup>z</sup>	South Devon coast	Removal of defence	2004	2
Medmerry <sup>aa</sup>	West Sussex coast	Realignment of defence	2013	320
Millennium Terraces	Thames	Realignment of defence	1998	0.5

Site name	Location	Method	Year	Area (ha)
Nigg Bay <sup>ab</sup>	Cromarty Firth	Realignment of defence	2003	25
Northey Island	Blackwater	Realignment of defence	1991	0.8
Orplands <sup>ac</sup>	Blackwater	Realignment of defence	1995	38
Paull Holme Strays <sup>c</sup>	Humber	Realignment of defence	2003	80
Pillmouth <sup>ad</sup>	Torridge	Realignment of defence	2000	12.9
Ryan's Field	Hayle	Controlled tidal restoration	1995	6.23
Saltram (Blaxton Meadow)	Plym	Controlled tidal restoration	1995	5
Seal Sands (North-west Enclosure)	Tees	Controlled tidal restoration	1993	9
Skinflats Tidal Exchange Project—STEP Forth <sup>ae</sup>	Firth of Forth	Controlled tidal restoration	2009	11
Stear Peninsula <sup>af</sup>	Parrett estuary	Realignment of defence	2014 (expected)	416
Thorness Bay	The Solent	Breach of defence	2004	7
Thornham Point	Chichester Harbour	Breach of defence	1997	6.9
Tollesbury <sup>ag</sup>	Blackwater	Realignment of defence	1995	21
Teraven Meadows <sup>b</sup>	Camel	Controlled tidal restoration	2007	15
Trimley Marsh <sup>ah</sup>	Orwell	Breach of defence	2000	16.5
Upper Lantern Marsh <sup>ai</sup>	Ore	Breach of defence	1999	37
Vange Marsh	Thames	Controlled tidal restoration	2006	1
Walborough	Axe	Controlled tidal restoration	2004	4.5
Wallasea <sup>aj</sup>	Crouch	Realignment of defence	2006	115
Warkworth	Coquet	Breach of defence	2009	0.4
Watertown Farm	Yeo	Breach of defence	2000	1.5
Welwick <sup>ak</sup>	Humber	Realignment of defence	2006	54
<i>USA</i>				
Cheniere Ronquille Barrier	Louisiana	Realignment of defence	2010	187
Island Restoration <sup>al</sup>				
East Harbor Lagoon <sup>am</sup>	Cape Cod National Seashore	Controlled tidal restoration	2011	?
Isles Dernieres Restoration	Louisiana	Realignment of defence	1999	314
Trinity Island <sup>an</sup>				
Little River Marsh Restoration <sup>ao</sup>	North Hampton, New Hampshire	Controlled tidal restoration	2000	81
Whiskey Island Restoration <sup>ap</sup>	Louisiana	Realignment of defence	2004	420
Surfside Beach (9 houses relocated)	Brazoria County, Texas	Managed retreat	?	—
Tarramar Beach	City of Galveston, Texas	Managed retreat	?	—
Sunny Beach	West Galveston Island	Managed retreat	2010	—

Site name	Location	Method	Year	Area (ha)
Wailea Beach	Maui	Managed retreat	2012	–
Brighthorn Beach Hotel	Coney Island, New York	Managed retreat	1888	–
Diamond City	North Carolina	Managed retreat	1899	–

<sup>a</sup> De Beukelaer-Dossche, M. and Decleyre, D. (eds.), 2013, [www.vliz.be/imisdocs/publications/250657.pdf](http://www.vliz.be/imisdocs/publications/250657.pdf)

<sup>b</sup> Sigma Plan, <http://www.sigmaplan.be/en/>

<sup>c</sup> Van den Bergh, E.; Verbessem, I.; Van den Neucker, T.; De Regge, N. and Soors, J., 2008. Evaluation of managed realignments in the Scheldt estuary. 6th European Conference on Ecological Restoration (Ghent, 8–12 Sept. 2008)

<sup>d</sup> Jacobs, S.; Beauchard, O.; Struyf, E.; Cox, T.; Maris, T. and Meire, P., 2009. Restoration of tidal freshwater vegetation using controlled reduced tide (CRT) along the Schelde Estuary (Belgium). *Estuarine, Coastal and Shelf Science*, 85, 368–376

<sup>e</sup> Beauchard, O., Jacobs, S., Cox, T. J. S., Maris, T., Vrebos, D., Van Braeckel, A., and Meire, P., 2011. A new technique for tidal habitat restoration: evaluation of its hydrological potentials. *Ecological Engineering*, 37, 1849–1858

<sup>f</sup> Digue Richet, Inventaire général du patrimoine culturel, [http://patrimoine.region-bretagne.fr/sdx/sribzh/main.xsp?execute=show\\_document&id=MERIMEEIA29004203](http://patrimoine.region-bretagne.fr/sdx/sribzh/main.xsp?execute=show_document&id=MERIMEEIA29004203)

<sup>g</sup> Conservatoire du Littoral, <http://www.conservatoire-du-littoral.fr/siteLittoral/222/28-ile-nouvelle-33-gironde.htm>

<sup>h</sup> Pays de La Loire, RNR de Sébastopol, <http://www.paysdelaloire.fr/les-pays-de-la-loire/reserves-regionales/actu-detaillee/n/polder-de-sebastopol/>

<sup>i</sup> Heurtefeux, H.; Sauboua, P.; Lanzellotti, P. and Bichot, A., 2011. Coastal Risk Management Modes: The Managed Realignment as a Risk Conception More Integrated. In: Savino, M. (ed.), *Risk Management in Environment, Production and Economy*. InTech, Rijeka, Croatia

<sup>j</sup> RESTORE, 2013. Case study: Beltringharder Koog Regulated Tidal Exchange Scheme. Available at: [http://restorerivers.eu/wiki/index.php?title=Case\\_study%3ABeltringharder\\_Koog\\_Regulated\\_Tidal\\_Exchange\\_Scheme](http://restorerivers.eu/wiki/index.php?title=Case_study%3ABeltringharder_Koog_Regulated_Tidal_Exchange_Scheme)

<sup>k</sup> IBA Hamburg, 2013. Pilot Project Kretsand, <http://www.iba-hamburg.de/en/themes-projects/elbe-islands-dyke-park/pilot-project-kretsand/projekt/pilot-project-kretsand.html>

<sup>l</sup> Barkowski, J.W.; Kolditz, K.; Brumsack, H. and Freund, H., 2009. The impact of tidal inundation on salt marsh vegetation after de-embankment on Langeoog Island, Germany—six years time series of permanent plots. *Journal of Coastal Conservation*, 13, 185–206

<sup>m</sup> Pickaver, A., 2010. A sustainable coastal defence re-creating wildlife habitats alongside economic farming methods, Abbott's Hall Farm—UK. OURCOAST project. Available from: <http://ec.europa.eu/ourcoast/index.cfm?menuID=8&articleID=5>, <http://www.wwf.org.uk/filelibrary/pdf/mu52.pdf>

<sup>n</sup> Manson, S. and Pinnington, N., 2012. Alkborough Managed Realignment (Humber estuary). Measure analysis in the framework of the Interreg IVB project TIDE. Measure 30. 25 pages. Hull. <http://www.tide-toolbox.eu/pdf/measures/Alkborough.pdf>

<sup>o</sup> Environment Agency, Camel Valley Wetland Restoration. [http://www.environment-agency.gov.uk/static/documents/Leisure/Camel\\_Valley\\_Wetland\\_Restoration.pdf](http://www.environment-agency.gov.uk/static/documents/Leisure/Camel_Valley_Wetland_Restoration.pdf)

<sup>p</sup> RESTORE Partnership (n/a), Lower River Roding Regeneration Project—Summary Report. [http://restorerivers.eu/wiki/images/e/ef/Lower\\_River\\_Roding\\_Regeneration\\_Project.pdf](http://restorerivers.eu/wiki/images/e/ef/Lower_River_Roding_Regeneration_Project.pdf)

<sup>q</sup> Clackmannanshire Council, Black Devon Wetland, <http://www.clacksweb.org.uk/environment/blackdevonwetland/>

<sup>r</sup> Myatt, L.B.; Scrimshaw, M.D., Lester, J.N. and Potts, J.S., 2002. Public perceptions of managed realignment: Brancaster West marsh, North Norfolk, UK. *Marine Policy*, 26, 45–57

<sup>s</sup> Hemingway, K.L., Cutts, N.C. and R. Pérez-Dominguez., 2008. Managed Realignment in the Humber Estuary, UK. Institute of Estuarine & Coastal Studies (IECS), University of Hull, UK. Report produced as part of the European Interreg IIIB HARBASINS project. <http://ec.europa.eu/ourcoast/download.cfm?fileID=863>

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- <sup>aj</sup> ABPmer, 2013. Wallasea Wetlands Creation Project. <http://www.abpmer.net/wallasea/>
- <sup>ak</sup> [http://restorerivers.eu/wiki/index.php?title=Case\\_study%3AWelwick\\_Managed\\_Realignment\\_Scheme](http://restorerivers.eu/wiki/index.php?title=Case_study%3AWelwick_Managed_Realignment_Scheme)
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