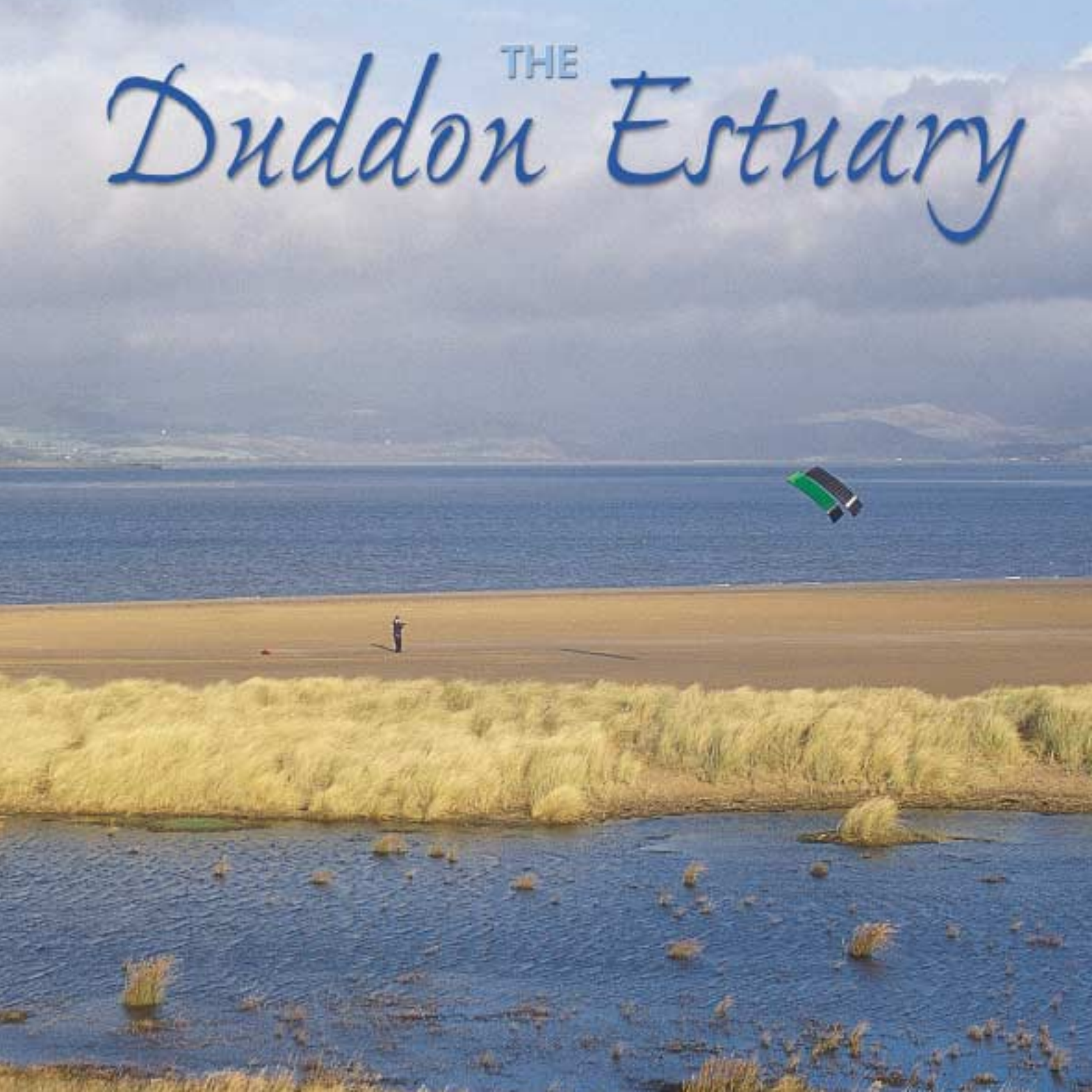


THE Duddon Estuary



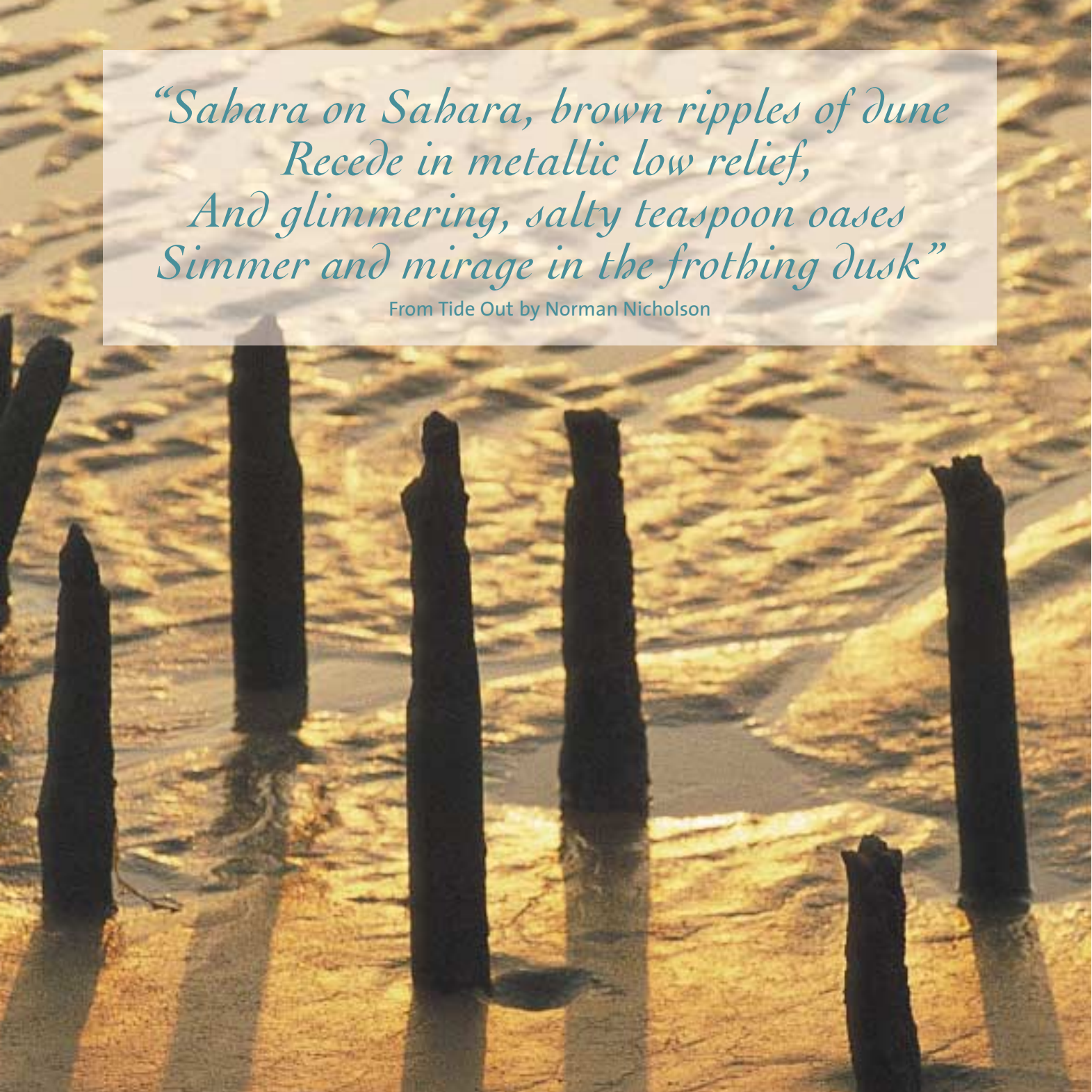
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Fishing boats at Askam Pier

Front Cover Pic: Kite flying at Sandscale Haws

A photograph of a beach at sunset. In the foreground, several dark, vertical wooden posts are scattered across the sand. The water in the background is filled with golden, rippling patterns, reflecting the low sun. The overall scene is warm and atmospheric.

*“Sabara on Sabara, brown ripples of dune
Recede in metallic low relief,
And glimmering, salty teaspoon oases
Simmer and mirage in the frothing dusk”*

From Tide Out by Norman Nicholson

An Introduction

The Duddon Estuary is a jewel in the crown of the Cumbrian coastline. Residents and visitors alike never cease to be impressed by the beauty of its setting, the strength of its tides, the breadth of its history and the diversity of its wildlife.

The estuary has been the subject of admiration and fascination for generations



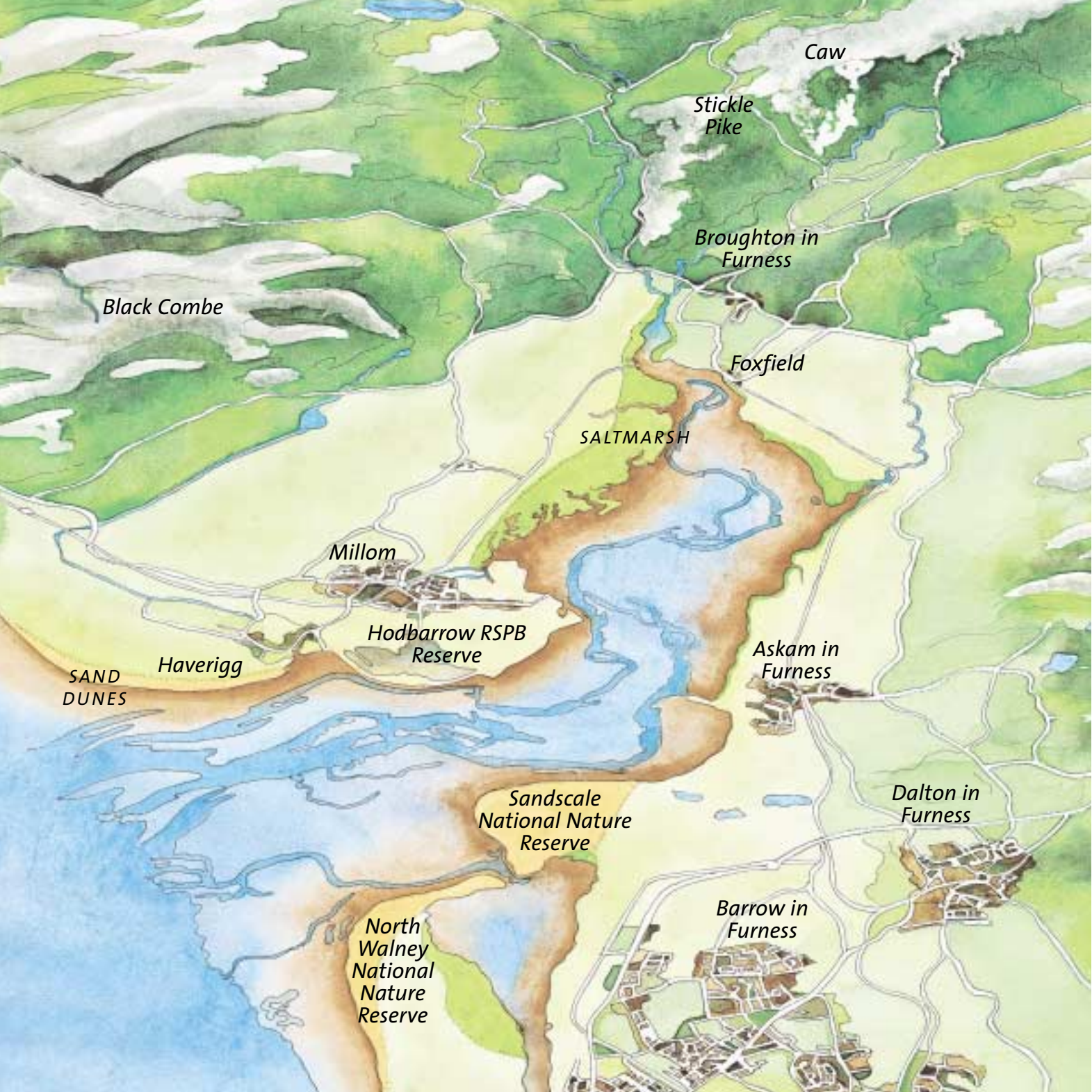
and its impressive, understated charms are sure to delight people for years to come.

Within the Duddon Estuary there are strong and important links between the land, sea, people, wildlife and industry. It is vital that these relationships are respected and maintained to ensure the special character and qualities of the estuary can be enjoyed by future generations.

LEFT PAGE:
Stakes at Kirkby Pool

THIS PAGE
*The Duddon Estuary
as seen from Corney
Fell*

*Dunnerholme Rock,
one of only two rocky
outcrops on the
estuary*



Caw

Stickle
Pike

Broughton in
Furness

Foxfield

Black Combe

SALTMARSH

Millom

Hodbarrow RSPB
Reserve

Askam in
Furness

SAND
DUNES

Haverigg

Sandscale
National Nature
Reserve

Dalton in
Furness

North
Walney
National
Nature
Reserve

Barrow in
Furness

A Journey through Space and Time

The Duddon Estuary lies at the southwest tip of Cumbria between the Furness Peninsula and Millom, to the north of the bustling port town of Barrow-in-Furness. Surrounded by the backdrop of the Lake District high fells, and dominated by the distinctive landmark of Black Combe on the northwestern shore and Kirkby Moor to the east, the estuary holds an enviable and dramatic position.



This impressive landscape has been formed over millions of years, and yet the present view is believed to look very similar to that of 10,000 years ago, after the retreat of the Holocene glaciers. These glaciers laid down a huge amount of sediment which has been reworked ever since by the mighty tides

to produce the changing patterns of the Duddon sands and estuary.

The Duddon Estuary is not merely a vast expanse of mud and sandflats. Enclosed within the boundaries of the surrounding hills and the Irish Sea an amazing array of habitats and landscape types hide a wealth of wildlife.



LEFT PAGE:
Map of the Duddon Estuary

THIS PAGE
Angerton Marsh, one of the largest swathes of saltmarsh to be found on the estuary

Channels at dusk

A Journey through Space and Time

From its source high in the Cumbrian fells, the River Duddon follows an exciting and varied journey as it makes its way to the Irish Sea. From high moorland it flows down through the woodlands and steep valleys of Dunnerdale, under Duddon Bridge and into the wide, open landscape of the estuary itself.



The channel flows past the extensive saltmarshes of the inner estuary which border much of the four and a half thousand hectares of mud and sand flats. Finally, the channels pass between the vast sand dune systems at Sandscale, Haverigg and North Walney before they meet the Irish Sea.

THIS PAGE
*Looking north up
the estuary from
Sandscale Haws
NNR*

A Journey through Space and Time

Jutting up into the south of the estuary like a scrawny, beckoning finger is the Isle of Walney, linked to Barrow-in-Furness by Jubilee Bridge across the Walney Channel. The unusual geological formation of this barrier island is the result of erosion and reworking of glacial sediments, rather than coastal deposition, and has generated a great deal of interest worldwide.

This dynamic environment sets a scene for a unique and fascinating estuary. An estuary which has been immortalised by the writings of many famous authors and poets, expressing the beauty and character of the area. William Wordsworth was particularly fond of the Duddon, expressing his heartfelt love of the river and its wider

l a n d s c a p e
i n t h e D u d d o n
S o n n e t s .
N o r m a n
N i c h o l s o n ,

the famous Millom poet, dedicated his work to the portrayal of honest un sentimental tales of his home and surrounding culture and landscape.



*“Not hurled precipitous from steep to steep;
Lingering no more ‘mid flower enamelled lands
And blooming thickets; nor by rocky bands
Held; but in radiant progress towards the Deep
Where mightiest rivers into powerless sleep
Sink, and forget their nature - now expands
Majestic Duddon, over smooth flat sands
Gliding in silence with unfettered sweep!”*

From The River Duddon
by William Wordsworth

THIS PAGE
Sand patterns formed
by the ever changing
tides

The glaciers and earth processes may have left their distinctive legacy on the landscape, but another force has exerted a great influence on the Duddon Estuary: man.

The earliest evidence of human settlement on the Duddon has been found on the northern tip of Walney Island. Cooking pots and arrowheads dating back to Neolithic and Bronze Age people have been found, supporting claims that even thousands of years ago, North Walney was a favourite spot!



The Industrial Age

The Duddon and its surrounding area was dominated by fishing and farming until the eighteenth Century when dramatic changes in technology and industry began to have profound effects on the landscapes and fortunes of the estuary and its people.



The Duddon Bridge Furnace has placed the area firmly in the industrial history books. The furnace was established in 1736 and using the water power of the River Duddon, produced pig iron from imported haematite transported up the Duddon by boat. The iron was then sent to Bristol and Chepstow to be fashioned into ship

chains and anchors. The furnace ceased to operate in 1867, but its remains are regarded as one of the best surviving examples of a charcoal-fired blast furnace in Britain.

Not long after the furnace closed, rich haematite deposits were found around the estuary, particularly at Hodbarrow and Askam. These soon became the sites of major ore mines and blast furnaces. With these mines came the associated iron works, railways, service industries and an influx of outside labour.



LEFT PAGE:
*Ships gathered at
Millom Pier c. 1920*

THIS PAGE
*Duddon Bridge
Furnace*

*The building of the
Hodbarrow Outer
Wall c. 1900*

The Industrial Age

The Hodbarrow mine evolved to become one of the most productive and important haematite mines in the world. Mining began in 1880 and with it started an epic battle with the sea. After two unsuccessful attempts to shield the mine from the sea by barriers, an enormous engineering project was set in place to build what has come to be known as the Hodbarrow Outer Wall. Five years and almost £600,000 later, the wall was completed in 1905 and deemed to be "a work of an unusual and exceptional kind". This wall repelled the sea, and although the mines closed in 1968, continues to stand testimony to the impressive engineering feat.



The iron industry may be gone, but reminders of this great age are still present in the landscape. Large swathes of slag bank, the result of the large scale iron manufacture, dominate the shoreline at Askam, Millom and Barrow. Today Hodbarrow is now a slightly saline lagoon following the subsidence and flooding of the mine area and Askam Pier continues to extend into the estuary as a reminder of the industrial age.

These industrial legacies now serve a very different purpose as favoured nesting, roosting and feeding sites for some of the interesting birds, plants and amphibians found around the Duddon.



THIS PAGE
Looking towards the ironworks over the rooftops of Millom

Hot slag being tipped at Millom

RIGHT PAGE
Walney Island and Barrow in Furness from the air

*“You can hear the noisy oystercatcher fishing
The ringing of the Curlew’s “coo-tee”
The tapping of the turnstone seeking supper
The whispered song sung by the rolling sea”*

From Fish Pie with Orchestra by Judith Nicholls





A Wealth of Wildlife

The wide variety of landscapes and habitats to be found around the Duddon Estuary are home to an array of wildlife.

The area is a haven for birds. In addition to its year round residents, the Duddon provides a vital link in the chain of migratory routes for thousands of birds flying north to their breeding grounds in the arctic having wintered in Africa and the Mediterranean.



Birds are drawn to the Duddon because of its location and the rich food source it provides. This banquet for hungry birds is provided by the small fish from the shallow water around the coastline, invertebrates and soft plants found on the saltmarsh, and rag worms, lug worms, mussels and other tasty morsels found in and around the vast mud and sand flats.



LEFT PAGE:
Ringed Plover - one of the Duddon's regular visitors

THIS PAGE
A tiny part of the enormous sand dune system at Sandscale Haws

Turnstone, knot and redshank roosting

Dune helliborine

A Wealth of Wildlife

Because of the wildlife importance of the Duddon, the estuary has been awarded a number of national and international conservation designations.



It is a site of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act (1981). The estuary has been awarded this national designation due to its wintering and breeding birds, natterjack toad population, invertebrates, geological features of North Walney and sand dunes and saltmarsh habitats.

More recently the area covered by the SSSI designation has been classified as a Special Protection Area (SPA) under the Birds Directive (1979). The Estuary qualifies as an SPA as it regularly supports nationally important numbers of breeding sandwich terns and provides feeding and roosting areas for many wintering and passage bird species.

The SSSI area south of Askam in Furness also falls within the area of Morecambe Bay candidate Special Area of Conservation (cSAC). This international designation is awaiting classification under the Habitats Directive (1994) because of important habitats such as saltmarsh, sand dune systems and mud and sand flats.

Because of the SPA and cSAC designations, the Duddon Estuary has been identified as a European marine site and a management scheme is being developed to ensure its sustainable management for the future.

The Duddon Estuary is also a Ramsar site, one of a series of important wetlands around the world.



THIS PAGE
Sandwich terns
fighting over a
sandeel

Lapwing

A Wealth of Wildlife

Species	When?	Habitat/ feeding requirements	See Pic on Page
Sandwich tern <i>Sterna sandvicensis</i>	Summer visitor (May – Sep).	Nest on bare slag material. Feed on sand eels and sprat.	14
Knot <i>Calidris canutus</i>	Winter visitor (Aug – April).	Feed on small shellfish and worms in intertidal areas	13
Pintail <i>Anas acuta</i>	Winter visitor (Sept - March)	Feed on small snails and other invertebrates	17
Redshank <i>Tringa totanus</i>	Winter visitor (Oct – March)	Feed on small shellfish and crustaceans	13
Ringed Plover <i>Charadrius hiaticula</i>	Winter visitor (Oct – March)	Worms and small insects	12
Sanderling <i>Calidris alba</i>	Winter visitor (Aug – April)	Feed on Sandhoppers, flies and other invertebrates	
Dunlin <i>Calidris alpina alpina</i>	Winter (Oct – Mar)	Feed on worms and shellfish	
Red-breasted merganser <i>Mergus serrator</i>	Year round	Feed on Small fish and worms	
Curlew <i>Numenius arquata</i>	Winter (Oct – Mar)	Worms and other intertidal invertebrates	
Shelduck <i>Tadorna tadorna</i>	Breeding Year round	Nest in saltmarsh and farmland. Feed on worms and small crustaceans	17
Eider <i>Somateria mollissima</i>	Breeding Year round	Nest in sand dunes and beaches. Feed on mussels and small crustaceans	
Lapwing <i>Vanellus vanellus</i>	Breeding Year round	Feed and nest on saltmarsh	14

THIS PAGE
Migration patterns
of birds within the
Duddon estuary

A Wealth of Wildlife



The Duddon's wildlife interest is not limited to birds. One of its other important residents is the internationally rare Natterjack Toad, found at only 50 sites in the UK, 5 of which are located on the Duddon Estuary and make up approximately 20% of the UK population. This species is particularly selective in its requirements, needing shallow seasonal ponds for successful spawning and loose material for burrowing into during hibernation.

The estuary is home to three Nature Reserves, at Sandscale Haws, Hodbarrow Lagoon and North Walney.

Sandscale Haws National Nature Reserve, managed by the National Trust is one of the best examples of a complete sand dune system in the North West of England. This complex environment boasts a variety of wildlife, not least of which are the colourful fungi that spring to life in autumn and over half of the Natterjack Toad population found on the Duddon.



North Walney National Nature Reserve is a dramatic and diverse environment.

Within its 650 hectares can be found sand dunes, heathland, saltmarsh, mudflats and impressive vegetated shingle ridges. These habitats are home to huge numbers of birds, insects and plants, including the rare Walney geranium. It is hard to believe that these two fascinating Reserves lie only minutes from the bustling town of Barrow-in-Furness.



THIS PAGE
Natterjack toad

Wax cap toadstools

The Walney geranium - Walney Islands only endemic species

A Wealth of Wildlife

On the Northern shore of the estuary, Hodbarrow Lagoon RSPB Reserve is another unusual and exciting site. Formed by the flooding of the mine after production had ceased, it is now home to over 100 bird species, protected from the force of the sea by the imposing outer barrier. Hodbarrow Lagoon and the nearby slag banks are important breeding sites for hundreds of sandwich common, little and arctic terns. The reserve is also a fantastic place to view other birds such as ringed plover, tufted duck and great crested grebe.



*“At the bank’s bottom step
The obtuse angled
Thrust of the tide
Shovels the pebbles
Inwards and slant wise,
for the surf to suck back again
The breadth of a winkle shell
From where they were before”*

From Shingle
by Norman Nicholson

THIS PAGE
Pintail with Shelduck
in the background

Hodbarrow Lagoon
from the air



BWBI

The Duddon Estuary Today

Not only did the mining industry leave its mark on the physical landscape of the area, but it also left its mark on the social landscape. Both Millom and Askam grew considerably, dominated by the characteristic 19th century terraced housing, still standing today.

Further up the valley, the historic market town of Broughton is a favourite with visitors flocking to see the Georgian Market Square. The Elizabethan custom of the yearly charter reading is re-enacted here on the first day of August each year.

The way of life in the estuary has almost come full circle. Today the Duddon is mainly an agricultural area with farmers making best use of the surrounding fell sides and marshland for grazing.



LEFT PAGE:
*Boats moored at
Haverigg Holiday
Village*

THIS PAGE
*Young boy playing at
Kirkby*

*Looking across
farmland to Kirkby
Moor at the northern
end of the estuary*



The Duddon Estuary Today

Fishing has also continued through the years with pleasure boats and commercial fishing taking place within and from the estuary waters.



The Duddon Estuary is home to species such as sea bass, turbot, sole, plaice and flatfish with very important plaice nurseries found at the mouth of the estuary.

Barrow-in-Furness remains the major service centre in the area providing a growing wealth of retail and leisure facilities. Shipbuilding has recently re-emerged to complement the

tradition of building submarines, as one of Barrow's premier industries with vessels built and launched from the port.

In recent years a new industry has made its mark around the Duddon. Love them or loathe them, the wind-powered turbines around Haverigg and on the fell sides are very much a part of the 21st century Duddon Estuary, providing a renewable energy source from the prevailing winds from the Irish Sea.



LEFT PAGE:
Plaice

THIS PAGE
*Pleasure boats
moored in the
Walney Channel*

*Wind turbines at
Haverigg*



The Future of the Duddon



Sustainable management is the key to the future of the Duddon Estuary. The Duddon Estuary Partnership, set up in the early 1990's has done much to promote this. The partnership, with its wide range of members and representatives from the main bodies responsible for management of the Duddon Estuary, provides a forum for discussion, debate and conflict resolution; a good basis for a successful future.

Everyone can help to manage and maintain the Duddon Estuary. Please respect the sensitive features and the wildlife when out and about. A small effort from everyone may result in a large difference in the longer term. Let's do what we can to keep the Duddon Estuary for future generations to enjoy.

LEFT PAGE:
*Walking at sunset
around Roanhead*

THIS PAGE
*The Duddon Estuary
as drawn by Jack
Ambrose, Askam
Village School*

Acknowledgements

If you would like to know more about the Duddon Estuary please contact:

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Ken Hopper - Front Cover - Duddon Estuary; Page 1 - Fishing boats at Askam Pier;
Page 3 - Dunnerholme Rock; Duddon from Corney Fell; Page 4 - Angerton Marsh; Channels at dusk;
Page 6 - Looking north from Sandscale Haws; Page 7 - Sand patterns; Page 13 - Dunes at Sandscale Haws;
Page 22 - Sunset at Roanhead.

Ian Brodie - Page 2 - Stakes at Kirkby Pool; Page 9 - Duddon Bridge Furnace; Page 19 - Young boy at Kirkby.

Peter Lewis - Page 11 - Aerial view of Walney; Page 17 - Hodbarrow Lagoon; Page 21 - Boats in Walney Channel.

Steve Cove - Page 8 - Ships at Millom Pier.

Peter Robinson - Page 18 - Boats at Haverigg; Page 21 - Haverigg Windfarm.

Millom Museum (CCC Archive Services) - Page 8 - Hodbarrow Outer Wall; Page 10 - Ironworks, Millom.

Gilbert Scunah - Page 10 - Slag tipping.

Steve Young - Page 12 - Ringed Plover; Page 14 - Lapwing.

John Leedel - Page 13 - Birds roosting; Page 17 - Pintail and Shelduck.

John Weir - Page 16 - Wax cap toadstool; Walney Geranium.

Alaister Smith - Page 14 - Sandwich Terns.

John Leedel - Page 13 - Birds roosting; Page 17 - Pintail and Shelduck.

Robert Petley-Jones/EN - Page 16 - Natterjack toad.

Peter Wakely/EN - Page 19 - Looking towards Kirkby Moor; Page 13-17 - Dune helliborine.

Paul Kay/MWPA - Page 20 - Plaice.

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