

= Cley Marshes =

Cley Marshes is a 176 @-@ hectare (430 @-@ acre) nature reserve on the North Sea coast of England just outside the village of Cley next the Sea , Norfolk . A reserve since 1926 , it is the oldest of the reserves belonging to the Norfolk Wildlife Trust (NWT) , which is itself the oldest county Wildlife Trust in the United Kingdom . Cley Marshes protects an area of reed beds , freshwater marsh , pools and wet meadows and has been designated as a Site of Special Scientific Interest (SSSI) , Special Area of Conservation (SAC) , Special Protection Area (SPA) , and Ramsar Site due to the large numbers of birds it attracts .

The reserve is important for some scarce breeding species , such as pied avocets on the islands , and western marsh harriers , Eurasian bitterns and bearded reedlings in the reeds , and is also a major migration stopoff and wintering site . There are also several nationally or locally scarce invertebrates and plants specialised for this coastal habitat . It has five bird hides and an environmentally friendly visitor centre and further expansion is planned through the acquisition of neighbouring land and improvements to visitor facilities .

The site has a long history of human occupation , from prehistoric farming to its use as a prisoner of war camp in the Second World War . The reserve attracts large numbers of visitors , contributing significantly to the economy of Cley village . Despite centuries of embankment to reclaim land and protect the village , the marshes have been flooded many times , and the southward march of the coastal shingle bank and encroachment by the sea make it inevitable that the reserve will eventually be lost . New wetlands are being created further inland to compensate for the loss of coastal habitats .

= = History = =

= = = Prehistory to 1926 = = =

Norfolk has a long history of human occupation . Both Modern and Neanderthal people were present in the area before the last glaciation between 100 @,@ 000 and 10 @,@ 000 years ago , and humans returned as the ice retreated northwards . The archaeological record is poor until about 20 @,@ 000 years ago , partly because of the prevailing conditions , but also because the coastline was much further north than at present . As the ice retreated during the Mesolithic , the sea level rose , filling what is now the North Sea . This brought the Norfolk coastline much closer to its present line , so that many ancient sites are now under the sea . The oldest signs of habitation on the marshes are prehistoric Clactonian flint blades possibly from 400 @,@ 000 years ago , but few other prehistoric remains have been recorded here .

Fragments of a Roman vase and jug have been found on the beach . A 1797 map showed what was described as the ruins of " Cley Chapel " , although it is more likely that they belonged to a barn . A 1588 map showed " Black Joy Forte " , which may have been intended as a defence against the Spanish Armada . There are a number of post @-@ medieval earthworks , presumably sea defences , and pits which may have been associated with salt @-@ making .

Until the mid @-@ 1600s , much of the area now known as Cley Marshes was part of a vast tidal marsh and was covered by seawater twice a day . The shoreline itself was hundreds of metres north of its present location . The raised area in the north @-@ west corner , called the " Eye " , has been farmed since the earliest human habitation . It was 28 ha (70 acres) in extent in 1651 , but is now much reduced by coastal erosion . Access to the Eye was by an ancient causeway , passable at low tide . John Heydon started the process of embanking the marshes to reclaim the land in 1522 , and his banks were extended and improved by Dutchman Jan van Hasedunch from 1630 . Simon Britiff , Lord of the local Manor of Cley , completed the scheme by building the bank on the east side of the Cley channel . Only the east and west banks have survived ; the north bank was breached by the sea in 1897 , then rebuilt with a concrete facing , but abandoned after another bad storm in 1921 .

Cley and nearby Blakeney had been prosperous and important ports in the Middle Ages , but land

reclamation schemes , especially those by Henry Calthorpe in 1640 just to the west of Cley , led to the silting up of the shipping channel and relocation of the wharf . Further enclosure in the mid @-@ 1820s aggravated the problem , and also allowed the shingle ridge at the beach to block the former tidal channel to the Salthouse marshes to the east of Cley . In an attempt to halt the decline , Thomas Telford was consulted in 1822 , but his recommendations for reducing the silting were not implemented , and by 1840 almost all of Cley 's trade had been lost to Blakeney and other Norfolk ports . The population stagnated , and the value of all property decreased sharply . In the mid @-@ nineteenth century , the Lord of the Manor constructed the present road to the beach in exchange for closing the ancient right of way across the marshes .

In the decades preceding World War I , this stretch of coast became famous for its wildfowling ; locals were looking for food , but some " Gentleman Gunners " hunted to collect rare birds . One of the best known of the latter was E. C. Arnold , who collected for more than fifty years , and gave his name to the marsh at the north @-@ east corner of the present reserve .

= = = Nature reserve era = = =

Cley Marshes reserve was created in 1926 when Norfolk birdwatcher Dr Sydney Long bought the land which now makes up the reserve for the sum of £ 5 @,@ 100 , to be held " in perpetuity as a bird breeding sanctuary " . Long then established the Norfolk Wildlife Trust .

The reserve was extended in 1962 through the lease of the adjacent 11 @-@ hectare (27 @-@ acre) Arnold 's Marsh from the National Trust ; this had long been the primary feeding area for waders , but much of the best habitat had been lost to the advancing shingle ridge . New pools and hides were created on the reserve from 1964 , and the sale of permits for access to the hides became a useful source of income for the NWT . Further pools and hides were established during the 1970s , and a visitor centre was built in 1981 on the site of the current building .

Over the long history of the reserve , it has had only three wardens , all from the same family . Robert Bishop was warden from 1926 to 1937 , and was followed by his grandson , Billy , from 1937 to 1978 . Billy 's son , Bernard , who was appointed in 1978 , is still managing the reserve .

The reserve now covers 176 hectares (430 acres) , and is of international importance for its breeding and wintering birds . It was designated as a Site of Special Scientific Interest (SSSI) in 1954 , and in 1986 it was subsumed into the 7 @,@ 700 @-@ hectare (19 @,@ 000 @-@ acre) North Norfolk Coast SSSI . The larger area is now additionally protected through Natura 2000 , Special Protection Area (SPA) and Ramsar listings , and is part of the Norfolk Coast Area of Outstanding Natural Beauty (AONB) . The reserve has been referred to as " a Mecca for birdwatchers " .

= = = Second World War coastal fortifications = = =

During the Second World War , Royal Artillery military fortifications were established at the beach end of the reserve , including two 6 @-@ inch (15 @.@ 24 cm) guns , five buildings , two pillboxes , a minefield , and concrete anti @-@ tank blocks . A spigot mortar emplacement and an Allan Williams Turret machine gun emplacement were sited closer to the village . One of the pillboxes and remains of the beach gun emplacements were still surviving as of 2012 .

The military camp held 160 men and was later used to hold prisoners of war . Italian , but not German , prisoners were allowed to attend dances at the anti @-@ aircraft camp at nearby Stiffkey . Near the end of the war , the camp was used to house East European refugees , and it was finally pulled down in 1948 . Many of the wartime buildings were destroyed by the Royal Engineers in 1955 , but the generator house was taken over by the coastguard service as an observation post . It was acquired by the NWT in 1983 , and the upper part was used as a look @-@ out , while the larger lower section became a beach café . The building was overwhelmed by shingle in a storm in 2008 and subsequently demolished .

= = Access and facilities = =

The reserve is to the north of the A149 coast road just east of the village of Cley next the Sea , 6 km (3 @.@ 7 mi) north of Holt . The visitor centre and car park are to the south of the road , opposite the reserve . The reserve can be reached by public transport using the bus service that stops outside the visitor centre .

The reserve is viewable from the visitor centre , footpaths next to the A149 and down the East Bank , the beach and the road running from the beach back to the main road . It can be accessed by footpaths at three points , each leading to one or more bird hides . Beach Road and the beach itself form part of the Peddars Way long distance footpath .

The present visitor centre , which opened in June 2007 , is on a small hill overlooking the reserve . It contains a café and shop , and is open daily . The reserve and hides are open at all times , with free access to NWT members , although non @-@ members must buy a permit .

The visitor centre is built on environmentally friendly principles . Its roof is covered with living sedum plants , rainwater is collected for re @-@ use , and the building 's energy profile is reduced using solar water heating , wind turbines and geothermal heat pumps . It has won a number of awards including the Emirates Glass LEAF architectural award for the sustainability category . The success of the centre has led to plans to develop it further , offering more services and educational facilities and enhancing its profitability for the Trust . The centre and four of the five bird hides are accessible to wheelchair users .

In 2012 the NWT launched a public appeal to raise £ 1 million to purchase 58 hectares (143 acres) of private land immediately to the east of the existing reserve , and adjoining the existing 66 ha (163 acre) Trust reserve at Salthouse Marshes . This purchase would create a unified 8 km (5 mi) stretch of NWT @-@ owned coastal land and expand the Cley reserve by one @-@ third .

= = Fauna and flora = =

= = = Birds = = =

The key breeding species are reed bed specialists such as the marsh harrier , Eurasian bittern and bearded reedling , and the island @-@ nesting avocet . Other birds nesting in the wetland include northern lapwing , common redshank and sedge , reed and Cetti 's warblers . Eurasian spoonbills , ruffs and black @-@ tailed godwits are present for much of the year , and a pair of little egrets bred for the first time in 2010 ? 2012 .

Spring migrants including little gull , black tern , Temminck 's stint and garganey may pass through on their way to breed elsewhere , and terns frequently visit from the colonies on Blakeney Point . In the autumn , birds arrive from the north . Some , such as whimbrels , curlew sandpipers and little stints , just pausing for a few days to refuel before continuing south , others staying for the winter . Offshore , great and Arctic skuas , northern gannets and black @-@ legged kittiwakes may pass close by in favourable winds . Large numbers of ducks winter on the reserve , including many Eurasian wigeons , Eurasian teals , mallards and gadwalls , goldeneyes and northern pintails . Red @-@ throated divers are usually on the sea , and brent geese feed on sea lettuce and other green algae . Barn owls and sometimes hen harriers quarter the marshes in winter , and snow bunting flocks can be found on the beach .

The reserve 's location means that migrants may be found , sometimes in huge numbers when the weather conditions are right . These may include vagrant rarities , including a western sandpiper in 2012 , a displaying great snipe in 2011 , a trumpeter finch in 2010 and a collared pratincole in 2009 . In order to maintain a good habitat , parts of the reed bed are cut and sold for thatch each year to establish a mosaic of plants of different ages .

= = = Other animals = = =

Water voles are a highly threatened species in the UK , with a huge decline in numbers of 70 ? 90

% , mainly due to predation by the introduced American mink , but also habitat loss and water pollution . They are still common at Cley , which is one of a number of East Anglian sites now of national importance for this species . Brown hares are widespread , and European otters may be seen , with spraints regularly found at the southern end of East Bank . The common frog , common toad and common lizard all occur on the reserve .

Arnold 's Marsh and the other lagoons nearest the beach are salty due to the percolation of seawater through the shingle bank . These saline lagoons may cover mud , firm sand or submerged vegetation , and hold some rare and threatened invertebrates including starlet sea anemone , lagoon sand shrimp , Atlantic ditch shrimp , the mysid shrimps *Paramysis nouveli* and *Neomysis integer* , lagoon cockle , the bug *Orthotylus rubidus* and spire snail . Little whirlpool ramshorn snail has been found in a freshwater channel . Rare beetles associated with these coastal environments include yellow pogonus , *Bembidion ephippium* and *Tachys scutellaris* . These marshes are the only reliable UK site for the Pogonus species , and even here it is localised and hard to find .

= = = Plants = = =

The shingle ridge that protects the reserve from the sea and extends to Blakeney Point attracts biting stonecrop , sea campion , yellow horned poppy , sea thrift , bird 's foot trefoil and sea beet . Sea barley is a scarcer species of this habitat . In the damper areas , sea wormwood , sea lavender and scrubby sea @-@ blite also thrive . The saltmarsh contains glassworts and common cord grass in the most exposed regions , with a succession of plants following on as the marsh becomes more established : first sea aster , then mainly sea lavender , with sea purslane in the creeks and smaller areas of sea plantain and other common marsh plants . The uncommon spiral tasselseed and long @-@ bracted sedge are other saltmarsh specialists . The upper saltmarsh has a number of scarce species including lesser centaury , curved hard @-@ grass and sea pearlwort , with soft hornwort in the dykes .

The drier areas of the reserve contain maritime grasses such as sea couch grass and sea poa grass . The reedbeds are dominated by common reed with saltmarsh rush , brackish water crowfoot , sea clubrush and common bulrush also common in the various wetland habitats . The coastal pastures at Cley and the adjacent Salthouse Marshes have jointleaf rush , common silverweed and less common grasses such as annual beard grass , marsh foxtail and slender hare 's @-@ ear . The site is generally rich in plants , especially those that can cope with saline environments , but three species appear to have been lost : divided sedge was last recorded in 1999 , grey hair @-@ grass in 1982 and lax @-@ flowered sea lavender in 1977 . Lichens are not suited to the prevailing habitat , but the nationally rare soot lichen occurs on untreated wood . The locally rare bryophyte Heim 's pottia occurs in the saltmarsh , and the coastal variety piliferum of cuspidate earth @-@ moss is found at Salthouse .

= = Recreation = =

A 2005 survey at Cley and five other North Norfolk coastal sites found that 39 per cent of visitors gave birdwatching as the main purpose of their visit . The 7 @. 7 million day visitors and 5 @. 5 million who made overnight stays in the area in 1999 are estimated to have spent £ 122 million , and created the equivalent of 2 @, 325 full @-@ time jobs . Cley Marshes , like Titchwell Marsh RSPB and Holkham NNR , attracts 100 @, 000 or more visitors annually .

Of the six sites , Cley and Titchwell have the highest proportion of pre @-@ planned visits , and Cley , together with neighbouring Blakeney , had the highest per capita spend per visitor . The equivalent of 52 full @-@ time jobs in the Cley area are estimated to result from the £ 2 @. 45 million spent by the visiting public .

The large number of tourists can have negative effects ; wildlife may be disturbed , particularly species that breed in exposed areas , such as ringed plovers , and plants can be trampled , which is a particular problem in sensitive habitats such as sand dunes and vegetated shingle . Damage can be reduced by measures such as wardening the breeding colonies and using fences , boardwalks

and signs to control access . The access paths to the hides , other than the northernmost , are largely boardwalked , and an extensive programme of fence replacement and improvements to the control of water levels on the reserve took place in 2010 ? 2011 .

= = Threats = =

The reserve shelters behind a ridge of shingle that runs west from Weybourne along the Norfolk coast , before becoming a spit extending into the sea at Blakeney Point . Saltmarshes can develop behind the shingle , but the sea attacks the ridge and spit through tidal and storm action . The amount of shingle moved by a single storm can be " spectacular " ; the spit has sometimes been breached , becoming an island for a time , and this may happen again . The northernmost part of nearby Blakeney was lost to the sea in the early Middle Ages , probably due to a storm .

The spit is moving towards the mainland at about 1 m per year , and for the last two hundred years maps have been accurate enough for the encroachment of the sea to be quantified . Blakeney Chapel , just west of the reserve , was 400 m (440 yd) from the sea in 1817 , but this had reduced to 195 m (215 yd) by the end of the twentieth century . The landward movement of the shingle also means that the channel of the River Glaven becomes blocked increasingly often , leading to flooding of the reserve and Cley village . The Environment Agency considered a number of remedial options to protect these vulnerable areas , and a new route for the river to the south of its original line was completed in 2007 at a cost of about £ 1 @. @ 5 million .

The sea defences at Cley were badly breached in 1742 , 1897 , 1953 and 1996 , with smaller incursions in 1993 and 1998 . The massive 1953 flood reached 8 km (4 mi) inland at Cley . A 2 m (6 ft) storm surge in December 2013 flooded much of the English east coast , and breached the shingle ridge at Cley , flooding the reserve and damaging or destroying the hides . Restoration of the reserve was assisted by Natural England , and the removal of salt was helped by natural freshwater springs . As of 2015 , the reserve was fully restored and functioning .

Although the financial benefits from the recreational value of the reserve currently outweigh the costs of maintaining the sea defences , managed retreat is likely to be the long @- @ term solution to rising sea levels at Cley and along much of the rest of the North Norfolk coast , and has already been implemented at other major sites including Titchwell Marsh . The important reedbeds at Cley will inevitably be lost due to increased saltwater flow into the marshes . To compensate , the Environment Agency and the Norfolk Wildlife Trust have been working since 2010 to make a new wetland near Hilgay . The 60 @- @ hectare (150 @- @ acre) Hilgay Wetland Creation Project is converting former farmland into a variety of wetland habitats by using banks , ditches and a lake to manage water levels . The Trust sees this as the first stage of a long @- @ term plan to create a roughly 10 @, @ 000 @- @ hectare (25 @, @ 000 @- @ acre) Wissey Living Landscape .