



Braunton Marsh

MANAGEMENT STUDY 2007

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Foreword

The collection of separate pastures, collectively known as the Braunton Marshes, represents a unique microcosm of traditional rural life in North Devon. The enclosure of the Marsh in 1811 for cattle grazing, and its continued management by the Braunton Marsh Inspectors and by the Braunton Marsh Internal Drainage Board, have created an invaluable example of traditional farming practices and methods of land drainage. Braunton Marsh is one of the few remaining marshes to be managed by an independent Internal Drainage Board.

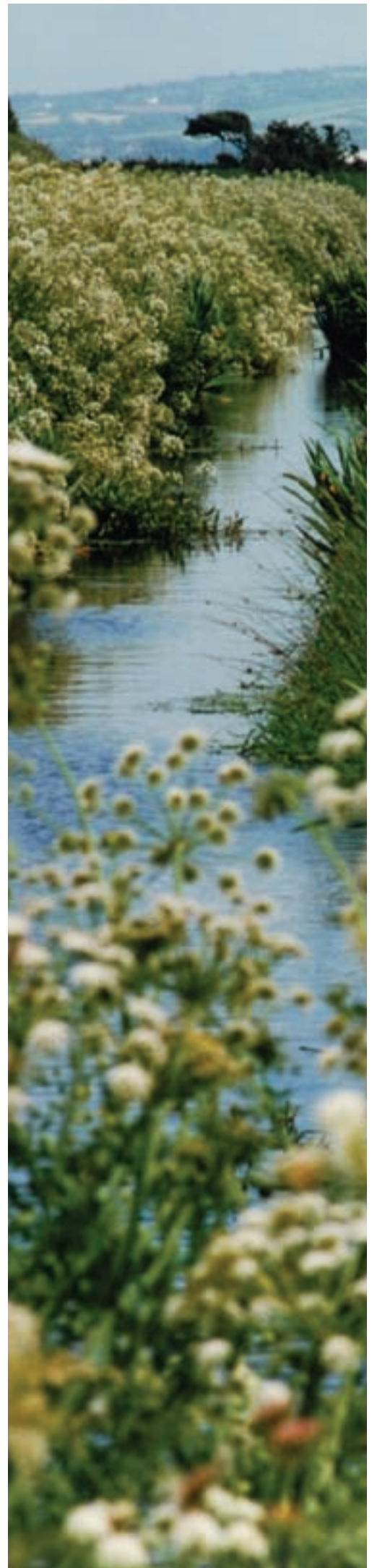
The Taw Torridge Estuary Forum has commissioned this Management Study to document and to raise awareness of the agricultural, historical, social, economic and environmental development of Braunton Marsh, which have contributed to making this area so distinctive and so important. The Study also ensures that the enormous contribution of all of the members of the marsh community in the management of the Marsh is recognised and celebrated. Without their support, this Study would have been impossible.

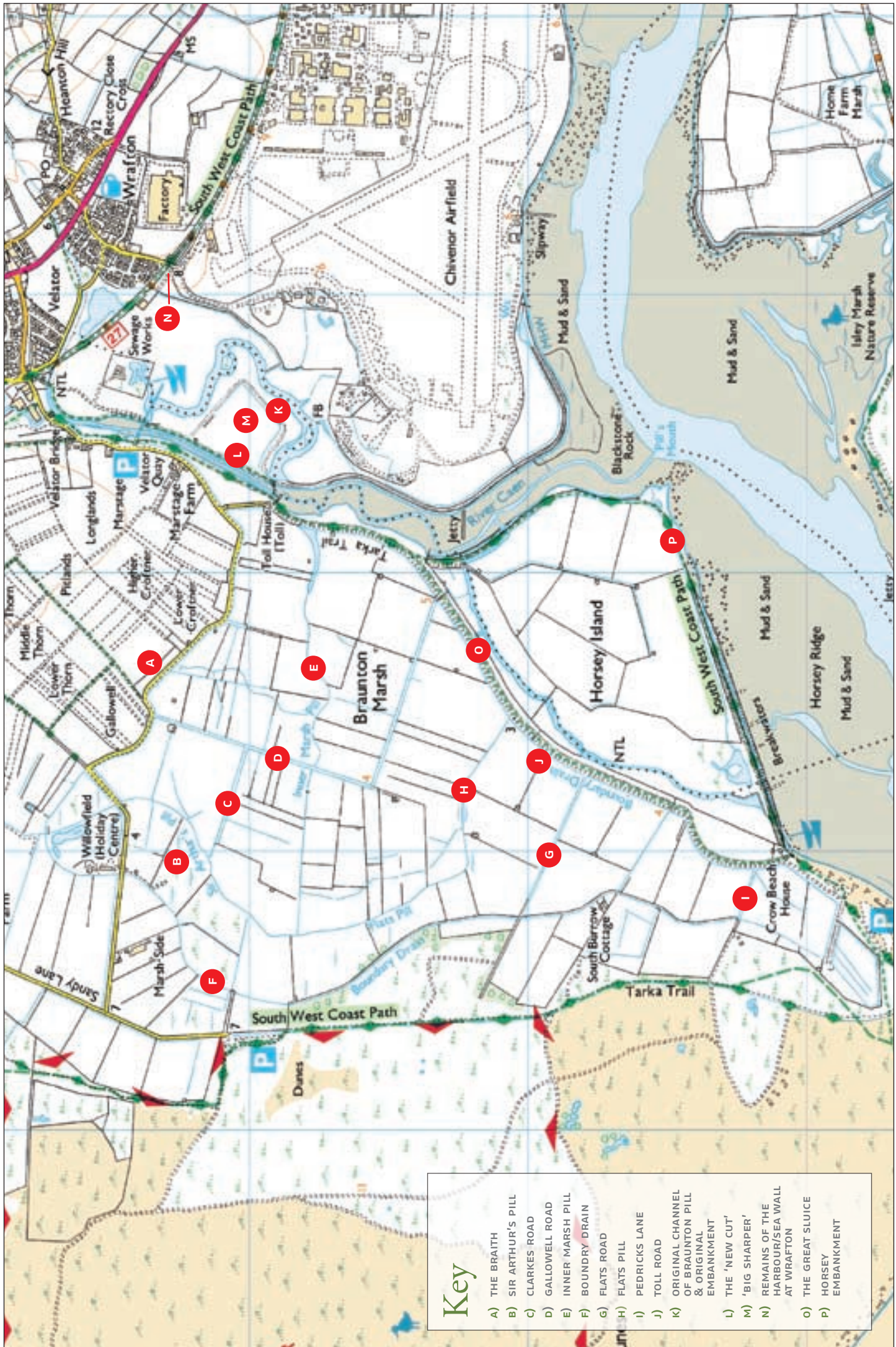
In our modern world, traditional practices are often not valued until they have been lost. This Study attempts to record a thriving part of North Devon's heritage and lifestyle, which deserves our full support and protection.



Rose Day
Chairman
Taw Torridge Estuary Forum

31st. December 2006





- Key**
- A) THE BRAITH
 - B) SIR ARTHUR'S PILL
 - C) CLARKES ROAD
 - D) GALLOWELL ROAD
 - E) INNER MARSH PILL
 - F) BOUNDRY DRAIN
 - G) FLATS ROAD
 - H) FLATS PILL
 - I) PEDRICKS LANE
 - J) TOLL ROAD
 - K) ORIGINAL CHANNEL OF BRAUNTON PILL & ORIGINAL EMBANKMENT
 - L) THE 'NEW CUT'
 - M) 'BIG SHARPER'
 - N) REMAINS OF THE HARBOUR/SEA WALL AT WRAFTON
 - O) THE GREAT SLUICE
 - P) HORSEY EMBANKMENT

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1 Introduction






The Braunton Marshes, discretely bordering Devon's rolling hills, lie near the mouth of the Taw Torridge Estuary, and are situated on the side of the former saltmarsh known as Braunton Marsh. The pastures, collectively known as the Braunton Marshes, are characterised by their landscape of flat pastures interspersed with numerous slow-flowing freshwater channels, and are inhabited by abundant wildlife and grazing cattle. Save for the numerous linhays, scattered across the quiet rural pastures, the significance that human activity has played in shaping the current vision of the Marshes is not immediately clear. However, delve a little further, and the Braunton Marshes yield a fascinating history of a developing agricultural community, which has sought to maximise the opportunities presented by its close association with the sea.

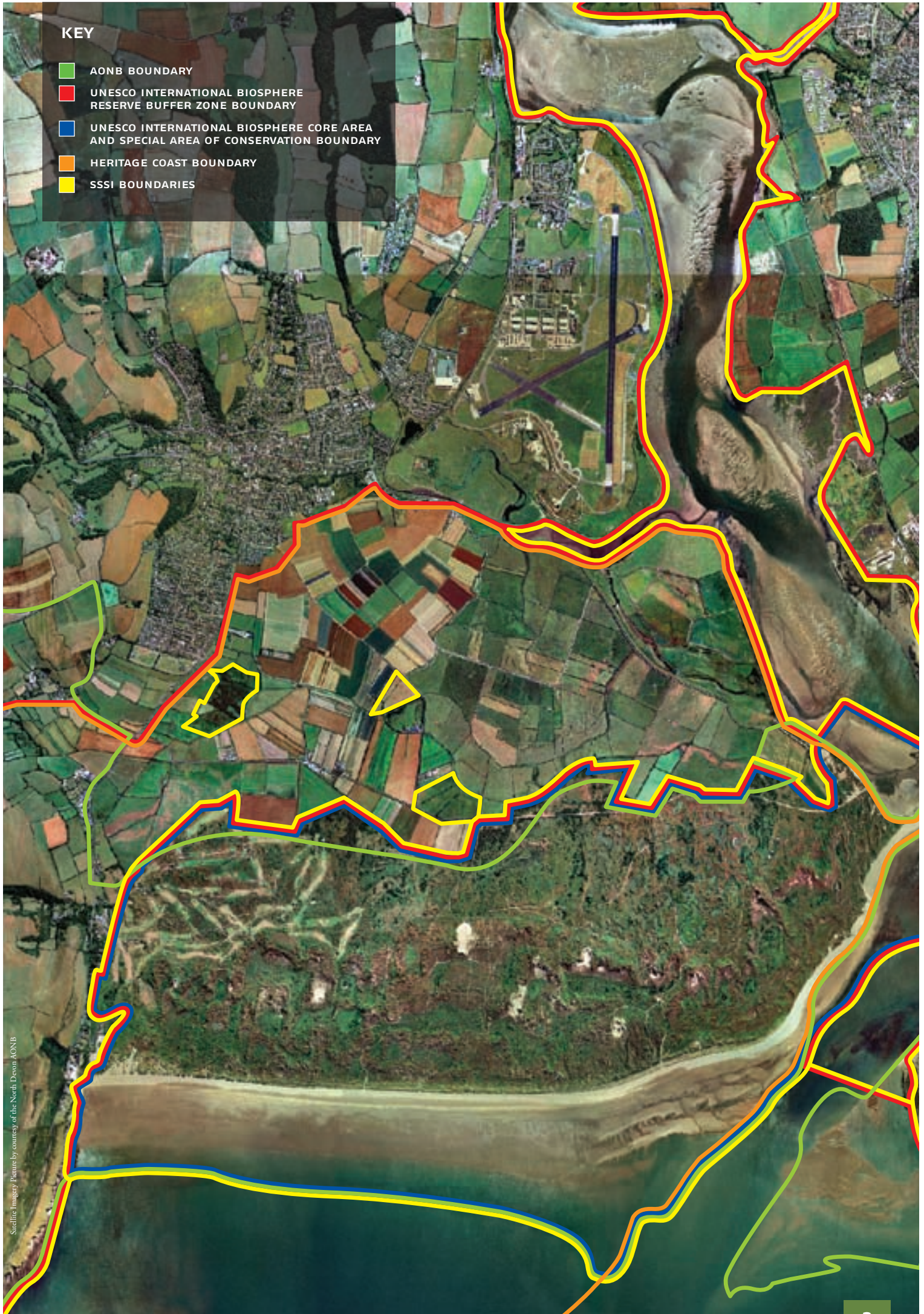
Today, the Braunton Marshes continue to be strongly influenced by the deep agricultural roots of the area. As can be seen across many of the coastal areas of North Devon, the agricultural community has been responsible for the retention of a largely unspoilt landscape. On the Braunton Marshes, the quality of the landscape is recognised by its inclusion within the wider Coastal Preservation Area, which influences any local planning developments. The Braunton Marshes are also valued as an environmental resource in their own right, and are adjacent to a number of national and international environmental designations. The Braunton Marshes lie between the SSSI designations of the Taw Torridge Estuary to the south, and Swanpool to the north. The SSSI of Greenaway and Freshmarsh also straddles the northern limits of the former saltmarsh. To the west, the Marshes are bordered by Braunton Burrows, an area which constitutes part of the North Devon Areas of Outstanding Natural Beauty (AONB). In recognition of the rare habitats within this dune system, Braunton Burrows is also protected as a Special Area of Conservation within the European Natura 2000 network and, in addition, forms the Core Area of the UNESCO International Biosphere Reserve. Braunton Marshes lie within the Biosphere Reserve Buffer Zone and the 1992 designation of the North Devon Heritage Coast, which is a non-statutory landscape definition. Many parts of the Marsh are also deemed to have the potential to become Devon County Wildlife Sites.

The following pages chart the changing landscape and culture of human activity on the Braunton Marsh, from its origin as a tidal saltmarsh, through the creation of the embankments, the enclosure of pastures, and the subsequent 200 years since their reclamation from the sea. In addition to the area's unique developmental history, this special region of land reveals the impact of technology on land-management practices experienced across the UK over the past century. Current pressures, such as an expanding population, the recent struggles facing British agriculture, sea-level rise and contemporary political efforts towards achieving sustainable development, mean that this area will continue to face potentially dramatic change and new challenges into the future.



KEY

-  AONB BOUNDARY
-  UNESCO INTERNATIONAL BIOSPHERE RESERVE BUFFER ZONE BOUNDARY
-  UNESCO INTERNATIONAL BIOSPHERE CORE AREA AND SPECIAL AREA OF CONSERVATION BOUNDARY
-  HERITAGE COAST BOUNDARY
-  SSSI BOUNDARIES



2 The Developmental History of Braunton Marsh

2.1 Pre-reclamation

2.1.1 A Brief Geological History

Stand at any point on the Braunton Marshes to view the panorama of hills stretching clockwise from Saunton Point to Appledore, and you can begin to understand the processes that created the low-lying estuary landscape. Beneath your feet lie up to 30 metres of accumulated sediments, which have been washed down from the hilltops over millennia. However, surprisingly little research has been conducted into investigating or mapping the area's geological past.

Over the last 2 million years, the sea level fluctuated dramatically as glacial periods came and went. This profoundly affected the type and position of sediment eroded from the hills and deposited on the slopes of the estuary basin. Over shorter timescales, changes in the course of rivers have also dictated the location of alluvial deposits. Indeed, the highly fertile Braunton Great Field, adjacent to the Marshes, is said to correspond exactly to the raised river terrace left when an ancient river course deepened¹. The offshore accumulation of vast quantities of rock, ground-up and carried great distances during glaciations, added further to the complex depositional patterns that betray the history of the estuary. The deposition of these sediments, swept inland by the sea, have left tell-tale evidence such as the raised beaches at Saunton Point, and almost 6 metres of sand accumulated on the slopes of Braunton's West Hill². Today, such offshore sand reserves continue to provide the source of Braunton Burrows, which were created at some time since the end of the last glaciation, around 12,000 years ago. Potentially, the dune system may have been created as recently as around the 14th Century, when an increase in offshore sediments were forced inland through an intensification of storminess following the Little Ice Age. The formation of the dunes is central to the creation of the Braunton Marsh, creating a sheltered environment on the leeward side of the sand system, where suspended riverine sediments could settle and a saltmarsh could begin to form³ (Fig 1 and 2).

The fine alluvial sediments of the Braunton saltmarsh are described prior to reclamation in a report to the Board of Agriculture by Charles Vancouver in 1808⁷ (Box 1), who enthusiastically advocated the fertility of such soils (Box 2). Using more modern terminology, Vancouver refers to properties of a higher than average Nitrate and Phosphate content typically found in estuarine silts. Following reclamation in 1815, the fertility of the Marshes rapidly gained an excellent reputation, as indicated in an 1848 notice of sale for land on the Marsh⁸. However farmers do describe differences between different pastures in their cattle-fattening properties⁵. This is presumably as a consequence of the dramatic variation in the soils of areas now considered to be part of the Braunton Marshes. The depth and composition of sediment varies quite considerably across the area, from almost pure sand in the west,

to a reported six-foot depth of clay loam soils further east⁴. In many ways, the soils reveal the boundaries of the Braunton Marshes in the strictest sense, technically referring only to the pastures within the former saltmarsh in the Parish of Braunton. With the progression of time, however, the boundaries have become blurred. For example, to the east, part of the original area of Braunton Marsh, now known as 'Big Sharper' has also been bisected by the creation of a new channel in 1850, and now lies on the eastern side of Braunton Pill. Today, many areas too far north or south, such as Horsey Island, are also regularly considered to be part of Braunton Marsh.

"The soil and upper structure of this marsh, consists of a tender, rich, soapy, hazel-coloured loam, on a subsoil of silt or fine sand, below which a coarser stratum of sand occurs, and in which gradations it seems to have arisen from a dark blue, or rather black, tenacious clay or gault, the usual colour of marine or common sea mud. This Marsh is covered with a carpet or fine matting of all the plants and grasses peculiar to such situations; is subject to be occasionally submerged to a slight depth by the tidal waters, and contains by estimation about 1200 acres."

FIG 1. VANCOUVER'S 1808 DESCRIPTION OF THE SOILS OF BRAUNTON MARSH.⁷

"salt-marsh... when ripe and ready for embankment, is the mildest, most temperate, and permanently fruitful of any in the universe... being formed of animal and vegetable exuvia, combined with the finest particles of terrene matter the tidal waters could hold in suspension, can never fail yielding the most ample returns from all such districts rescued from the ocean."

FIG 2. VANCOUVER'S 1808 DESCRIPTION OF THE BENEFITS OF SALT-MARSH RECLAMATION.⁷

- 1 - Edmonds, E. A., 1972; The Pleistocene history of the Barnstaple area. Inst. Geol. Sci., Rep. 72/2
- 2 - Notes of Commander Gammon, various locations, Braunton Museum
- 3 - Parkinson, M. A., 1976; A tentative historical ecology of parts of the Taw estuary - Braunton Marsh. Trans. Devon. Assoc. 108; 37-60
- 4 - Whitley, N., 1861; On the embanking and reclamation of the marshlands of the manor of Heanton Punchardon, North Devon. Journal of Bath and West of England Society. 9; 283-295
- 5 - John Hartnoll and Owen Slade, personal communication, 2006
- 6 - Green-Pascoe Survey, 1809; Deposited Plan 17, Devon Records Office, Sowton, Exeter
- 7 - Vancouver, C., 1808; A General View of the Agriculture of the County of Devon, with observations on the means of its improvement. Report for the Board of Agriculture. Reprint 1969 (Copy held at North Devon Studies Library)
- 8 - Sale particulars, 1848; Inclledon-Webber Collection, Braunton Museum 3704M/SS



FIG 1. RELIC TIDAL GUTS ARE EVIDENT ACROSS THE BRAUNTON MARSHES

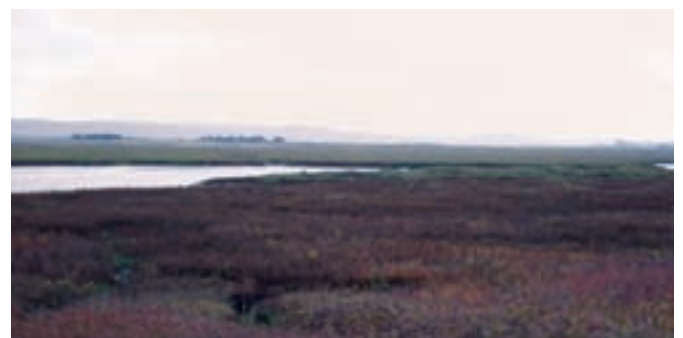


FIG 2. ACROSS THE ESTUARY, THE SALT MARSH AT ISLEY MARSH SUGGESTS HOW THE BRAUNTON MARSH MAY ONCE HAVE LOOKED

2.1.2 Braunton Marsh Prior to Enclosure

Agriculture has long been the primary industry for the people of Braunton. Over the past 1000 years, most farmers would have rented land and accommodation from the wealthy landowners of the area. In most cases, tenancy agreements would have included the right to graze stock on the common lands of Braunton (Appendix 2), which also included the area of the Braunton Marsh. It is also highly probable that the marshes and mud flats were also routinely used for the harvesting of cockles and seaweed at this time. The Marsh would have resembled a similar habitat to that seen today across the estuary at the Isley Marsh RSPB Reserve, and would have supported a wide variety of estuarine birds. The environment was almost undoubtedly a very hazardous one, with Parish register records reported to describe incidents of drowning at a place known as the 'stepping stones' in the marshes¹.

In 1808, Charles Vancouver visited Braunton while preparing to publish a report for the Board of Agriculture². Estimating the current value of the whole Marsh at just £10, Vancouver surmised that, upon reclamation, land could fetch up to £3 per acre². His recommendation for the enclosure of the saltmarsh at Braunton, Velator, Wrafton and South Burrow were well received by most major landowners. Soon after Vancouver's initial suggestion was made, moves to implement the enclosure and the new drainage system were rapidly explored, and the engineer, James Green, was appointed. However, records suggest that several contentious issues over the cost and the nature of the reclamation scheme delayed proceedings (Appendix 3). Nonetheless, just 3 years after the initial suggestion of reclamation was made, work on the embankment and the enclosure of Braunton Marsh was finally able to begin. The construction work commenced under the leadership of three Marsh Commissioners, who had been appointed under the 1811 'Act for the Inclosing, Draining, and Embanking of Lands in Braunton, in the County of Devon'. The Act of Parliament instructed upon the management of all stages of the reclamation, and laid out all of the responsibilities and powers of the Commissioners to oversee the construction work. The Act also determined what was to occur after the completion of the works, stipulating that the role of the Commissioners should revert to the responsibilities of one or more Marsh Inspectors, who would oversee the maintenance and management of the Marshes (For details of the role of the Marsh Inspectors see Appendix 5).

1 - Notes of Commander Gammon, various locations, Braunton Museum

2 - Vancouver, C., 1808; A General View of the Agriculture of the County of Devon, with observations on the means of its improvement. Report for the Board of Agriculture. David and Charles. (Reprint 1969) (Copy held at North Devon Studies Library)

2.2 Post-reclamation

2.2.1 Construction Work and the Financing of the First Reclamation, 1811-1815

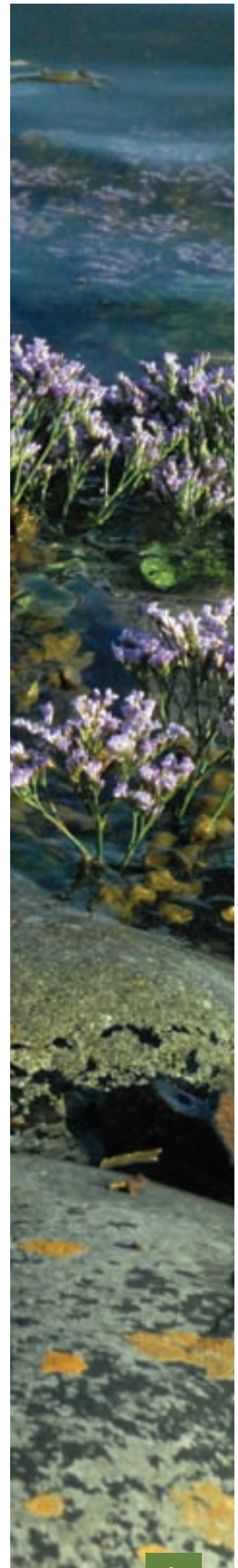
Unfortunately, details from 1811 until the completion of the works are very patchy, with research uncovering few indications of the embankment's construction phase or financial records. Despite this, occasional extracts from various documents do help to paint a hazy picture of the time, the details of which can be found in Appendix 4. Essentially, it appears that the construction works were divided into sections, with those landowners, who would gain direct benefit, lending the money for the works. The loans would be paid back from the proceeds made from selling various plots of land after the reclamation was complete. Details of one phase of construction show that tenants temporarily paid reduced rents during the period of construction work, but were expected to pay the interest on money loaned by their landlord for improvements to the land they were renting. After completion of the work, tenants were also expected to pay a lump sum, corresponding to the increased value of the land and the length of their lease. Both tenants and landowners, therefore, each had a vested interest and were watchful of the costs paid by the Commissioners for the enclosure and drainage works.

Records suggest that work on the embankments had progressed rapidly by 1813 and, in September 1813, around the time of the highest annual tides, the first sales of land on the Marsh were held, followed by two more in 1814. The allotment of land to the holders of Common Rights on the Marsh, and the instigation of the first drainage charges by the Marsh Inspectors in 1815, signified the final stages of reclamation work had been completed (Appendix 5). Sadly, there are no accounts of the ultimate cost of the combined works, although an early estimate made by Green in 1809 stated that reclamation could not be undertaken for less than £20,000¹ (calculated as equivalent to £1,156,807.46 against the 2005 Retail Price Index³). A secondary source also reported that the proceeds from the sale of lands amounted to around £25,000², although this remains unconfirmed by the primary sources accessed for this study.

1 - Extracts from the Diaries of Philip Roger Webber, Braunton Museum

2 - Parkinson, M. A., 1976; A tentative historical ecology of parts of the Taw estuary – Braunton Marsh. Rep. Trans. Devon. Assoc. Advmt Sci 108; 37-60

3 - Officer, L. H., 2006; Purchasing Power of British Pounds from 1264 to 2005. MeasuringWorth.com



2.2.2 The Second Reclamation, 1853-1857

After the first reclamation, the main quay was at Wrafton. The remains of a sea or harbour wall is positioned to the west of the railway underpass (now the Tarka Trail) on the western edge of the village. Until a few years ago, it is reported that the metal hooks for boat moorings could still be seen¹. The route to the original pill followed a winding channel, and was of insufficient depth for larger vessels. The records suggest a long-standing desire to develop a new quay along the Braunton Pill, which would be capable of mooring larger vessels. Despite the efforts made by the Marsh Inspectors to pursue this goal in the early 1840s, the development of the new quay at Braunton was not destined to occur until after the Heanton Estate was sold to the Williams family around 1850.



THE STRAIGHTENED SECTION OF THE BRAUNTON PILL, ALSO KNOWN AS THE 'NEW CUT'



THE OLD SEA WALL AT WRAFTON

In January 1853, the Williams' Estate revealed an ambitious plan for further reclamation of tidal lands of both Velator and Wrafton Marsh, to include the straightening of the Braunton Pill. Despite the misgivings of the engineer, Nicholas Whitley, the enclosure of 'a barren patch of sand' at Horsey Island was also undertaken. The details of this important phase of the development and diversification of the area surrounding, and influencing, the Braunton Marsh, are contained in Appendix 6. Details include the significant difficulties encountered by the construction of embankments on areas of quicksand, the structure of the banks, the necessity for land drainage, agreements with the Marsh Inspectors, and the overall cost, which totalled around £18,000 (calculated as equivalent to £1,110,958.38 against the 2005 Retail Price Index²). The reclamation and the straightening of the Pill were completed in 1857.

In fact, the overall venture to reclaim further agricultural land does not appear to have provided a substantial return on the Williams' Estate investment. Further insult may have been added to this injury, when the newly reclaimed lands were subsequently divided by the new Barnstaple to Ilfracombe railway line, which opened in 1874. However, along the recently straightened section of the Braunton Pill, the Williams' Estate also invested in the long-awaited new quay at Velator, which is thought to have been completed in 1870. It is probable that the diversification and the economic opportunity created by the construction of the new quay may have proved a more profitable enterprise. Unfortunately for the Williams' Estate, by the mid 1870s, expensive maintenance works were already necessary to protect the Western end of the Horsey Embankment through the construction of a stone groyne. Further expense was also required in order to strengthen parts of the new straightened embankments of the Braunton Pill, which were built on quicksand and already beginning to subside.

1 - Owen Slade, personal communication, 2006

2 - Officer. L. H., 2006; Purchasing Power of British Pounds from 1264 to 2005. MeasuringWorth.com



THE REMAINS OF A SHOOTING BRIDGE ACROSS DUCKPONDS NOW FOUND ON THE SITE OF THE ORIGINAL BRAUNTON PILL; A SITE BELIEVED TO HAVE HELPED INSPIRE HENRY WILLIAMSON'S "TARKA THE OTTER". THE REED BEDS FOUND HERE ARE ALSO BELIEVED TO HAVE BEEN HARVESTED FOR THATCHING. TOGETHER WITH THE EXPANSION OF TRADE CREATED BY THE NEW QUAY AT VELATOR, SHOOTING AND REED PRODUCTION DEMONSTRATE THE ECONOMIC DIVERSIFICATION ENABLED BY THE STRAIGHTENING OF THE ESTUARY CHANNEL.

3 The Twentieth Century

3.1 The Breach of the Horsey Embankments, 1910

3.1.1 The Storm

In December 1910, high tides combined with a south-westerly gale wreaked devastation along much of the North Devon coast. A report from the North Devon Journal Herald describes an estimated damage of over £5,000 was caused to the Braunton Marshes. Linhays and stone walls were destroyed, and large quantities of sand, gravel and debris were distributed over lands adjacent to the banks¹. Most of the livestock in the pastures affected by flooding were drowned, along with hundreds of partridges and rabbits¹ (Box 3).

“Visiting the scene on Saturday morning a labourer was surprised to find a number of live rabbits up a tree – a striking instance of animal sagacity. With the exception of the rabbits, three sheep, which miraculously escaped drowning in some totally inexplicable way in a linhay were the only living things left in the neighbourhood.”

BOX. 3 EXTRACT FROM A NORTH DEVON JOURNAL HERALD REPORT SHORTLY AFTER THE 1910 STORM¹

The North Devon Journal Herald article describes the ground on either side of the newly - straightened Braunton Pill as being flooded on every tide. The water was reported to extend from the railway line at Wrafton, across to Velator, and into the marsh pastures, posing a great risk of flooding to the houses nearby¹ (Box 4). The local newspaper article goes on to describe a large vessel being drawn through a breach in one of the embankments on the rush of the tide, whilst coming into Velator Quay, and exiting the Marshes when the tide turned¹. These descriptions suggest that the flooding of the Braunton Marsh was quite significant. However local legend and remaining photographic evidence from the time are focused upon what was presumably the worst damage, at Horsey Island. A breach in the embankment of the newly-straightened channel is also confirmed in a 1913 report of the repairs² but, unfortunately, provides few details about the scale or repercussions of the breach, or of the repair works required.

“Owing to the enormous breaches in the bank, the whole of the Marshes – which are some miles in length – are flooded at every tide, and houses in the neighbourhood are in constant danger of being flooded.”

BOX. 4 EXTRACT FROM A NORTH DEVON JOURNAL HERALD REPORT SHORTLY AFTER THE 1910 STORM¹

1 - Article, North Devon Journal and Herald, issue; 22.12.1910

2 - W. J. Douglas, 1813; Précis of the disaster and repairs to Horsey Embankment, River Taw, Devon. B170 add/123-131

3 - Original photograph held at Braunton Museum

4 - Original photograph held at Ilfracombe Museum



'BRAUNTON MARSH AFTER THE GALE - (DROWNED SHEEP)⁴



'BRAUNTON MARSH AFTER THE GALE - (DAMAGED BANK)³

3.1.2 Horsey Island Repair Work

Regardless of the truth or exaggeration in the North Devon Journal Herald editorial, it is certainly true that the 1910 storm caused extensive damage. Under the conditions set out by the Marsh Inspectors at the time of the second stage of reclamation in the 1850s, the Estate of the late Sir William Williams was now liable for the costs of the repair work, both along the straightened section of the Braunton Pill, and at the Horsey Embankment, where the worst of the breaches appear to have occurred. Three detailed records of the construction and of the schedule of repair works remain; the contract for repairs¹, the financial statement of repair work², and a final report produced by the engineer in charge, Mr W. T. Douglass³. The latter of these reports suggests that the breaching of the Horsey Embankments may have been owed partly to the activities of burrowing rats³, which had undermined parts of the banks. Plans indicate the exact size and position of 5 breaches on the Horsey Embankment that were subject to the repair work⁴. The widest and deepest of these breaches was Breach No.1, a gap of 254ft. in length, positioned closest to the White House, with shorter and/or shallower breaches of 160ft., 335ft., 140ft. and 66ft. in length^{3,4}. As might be expected, the repair work, which began in the summer of 1911, was not a straightforward affair. The expensive task of repairing the breaches was compounded by the difficulties of tidal scour, which frequently set back the work by further eroding the damaged sections of embankment. The innovative decision to sink derelict barges into some of the breaches was taken, yet reports seem to suggest that this served only to amplify the scouring action of the sea, as it poured around the gaps between the embankment and the barge. Two months after the seven months estimated to complete repairs, the original contractor resigned from the job, and subsequently work was completed under the administration of the Williams' Estate Trustees. The final cost of repairs eventually totalled £19,602³ (calculated as equivalent to £1,284,715.08 against the 2005 Retail Price Index⁵), with evidence that the final stages of work were still being conducted as late as February 1913³. Details of the repair works and the events of the time are provided in Appendix 7.

1 - Contract for the works of repair to Horsey Embankment, River Taw, Devon, 1811; B170 add/128-131

2 - W. J. Douglass, 1813; Financial Statement for the works of repair to Horsey Embankment, River Taw, Devon. B170 add/123-131

3 - W. J. Douglass, 1813; Précis of the disaster and repairs to Horsey Embankment, River Taw, Devon. B170 add/123-131

4 - W. J. Douglass, 1811; Plans and longitudinal sections of the breaches to the Horsey Embankment. B170 add/123-131

5 - Officer. L. H., 2006; Purchasing Power of British Pounds from 1264 to 2005. MeasuringWorth.com

3.2 Early Twentieth Century Agriculture

Agricultural life on the Marshes in the early Twentieth Century is unlikely to have differed much from that of the preceding fifty or one hundred years, with a continuation of traditional farming practices, and an ethos of pragmatism and self-sufficiency. The labour demands of the agricultural industry were high, and the numerous small farms employed many people to work on the land. With little technology, what machinery there was, was pulled by horses, with much work being done by hand. With respect to the Braunton Marsh itself, however, the labour requirements of this prime cattle-grazing land were comparatively low relative to the requirements of arable farming such as that conducted on the neighbouring Great Field. Over a typical year, a familiar pattern of activities was



A HERD CONTAINING 'DEVON REDS', A BREED LIKELY TO HAVE BEEN TRADITIONALLY FARMED ON THE BRAUNTON MARSH BOTH BEFORE, AND AFTER ITS' ENCLOSURE.

followed. Cattle were taken in over the winter months and reintroduced to the Marshes in the spring, the weed was cut and hedges were made towards the end of the summer and there was even time to maintain field drainage by cutting narrow channels across the pastures where necessary¹.

Traditionally, very little hay was ever cut on the Marshes. Relatively little improvement of the Marsh soils was needed, although some farmers occasionally spread a little potash or slag on their land to sweeten the grass². Similarly, on the embankments rented out by the Marsh Inspectors for sheep grazing, lime was occasionally also spread, perhaps once a decade, as indicated by a few rare entries within the Marsh Inspectors' records. Only sheep grazed the embankments, for fear of the damage that the cattle might cause to the banks. On the marshes themselves, sheep could not be grazed all year round owing to their increased susceptibility to contract Fascioliasis, or 'liver rot' caused by the parasite (*Fasciola hepatica*), also known as liver fluke. The marshes make a prime site for this condition, as the complicated lifecycle of the liver fluke is completed by association with freshwater snail *Lymnaea truncatula*, which live in marshy areas. Braunton Marsh was therefore traditionally used for grazing cattle, which fattened quickly on the rich pastures and were less affected by liver fluke. Historically, sheep only ever grazed the marshes during the autumn and winter months; a time when cattle had been taken off the marshes and liver fluke was less virulent³.



The Marsh lincays are intrinsically associated with the traditional cattle farming of the area. The construction of the numerous lincays on the marshes is believed to have started almost immediately after the initial enclosure was completed. Almost all lincays appear to have been built by the time of the 1842 tithe map of Braunton Parish. Lincays are two-storey, open-sided cattle shelters, with a talet which was used to store feed. Such buildings are found predominantly in the South West, and provided essential shade and shelter for cattle, giving relief from flies in summer and shelter from the cold in the spring and the autumn. Some Marsh farmers may also have used their Lincays to over-winter their cattle.

Throughout the first part of the century, farmers remained, as ever, responsible for the various boundaries and drains laid out when the Marsh was enclosed. The Marsh Inspectors continued to manage the drains under their jurisdiction, paid for by the drainage rates. As occurred during the previous century, the occupant of the Inspectors' House (section 3,4) was often employed for the purpose of drain clearance, and provided these services in return for free accommodation. The occupant of the Inspectors' House would also have been paid by most farmers to check and feed cattle as required. However farmers with milking cows would have needed to visit their animals twice a day, with most using the direct route of the 'milking path' from Braunton Village, which cut across the Great Field⁴.

1 - Reginald Ashdon, personal communication, 2006

2 - John Avery, personal communication, 2006

3 - Richard Dyer, personal communication, 2006

4 - Owen Slade, personal communication, 2006

3.3 Twentieth Century Changes in the Marsh

3.3.1 Creation of the Drainage Board 1943

The golden age of land drainage had peaked in the 1850s. With long-term agricultural decline, and with an increase in material and labour costs by the end of the First World War, land drainage was no longer economically viable¹. Disinvestment in existing drainage systems meant that agricultural productivity was falling despite the Government's aims to pursue optimal agricultural output. Following the recommendation of a Royal Commission in 1927, the Land Drainage Act of 1930 set about consolidating the 'complex, archaic and chaotic' drainage administrations across the UK into a uniform system². The proposals aimed to create central drainage authorities, responsible for river catchments. The central drainage authorities would then supervise elected internal drainage authorities, who were responsible for smaller drainage areas². It was anticipated that landowners would be unlikely to favour the disruption caused by the re-organisation without perceiving any personal advantages. To counter any resistance from landowners, the changes were also advocated on the grounds of increased employment, the partial shifting of the financial burden to general tax payers through grants and loans, and the expansion of traditional drainage areas to encompass more rate-paying landowners¹. Dictating the establishment of a more standardised system of management bodies for water catchment and drainage areas, in association with Local Authorities, the nationwide restructuring was to change the management structure of the Braunton Marshes forever.

In 1943, a proposal by the Ministry of Agriculture for a new drainage board appears in the



Marsh Inspectors' minutes¹. By this time, many other internal drainage boards (IDB), had already been established around the country. Spurred on by the food production campaign of the Second World War, the three Marsh Inspectors, together with four other marsh landowners, were invited by the Ministry of Agriculture to follow the lead of existing IDBs, and become the first board members of a new Braunton and District Drainage Board² (now referred to as the Braunton IDB). After the first year, members would then be elected from amongst the landowners. The Board was also to include representation from the District Council, a clerk, and an engineer. The proposals, however, were met with the suspicion of several marsh owners, concerned that existing rights and privileges for autonomous management of marsh drainage might be taken away. On October 1st 1944, the Marsh Inspectors' powers of drainage were officially transferred to the new Board, however animosity between some landowners continued for several years. The Board brought about an advance in technology with the initial introduction of a Priestman Cub Excavator (an early predecessor of a modern swing shovel) to help clean out the drains³. However, during the 1960s and early 70s it appears that the drains were once again cleaned by hand under the direction of the IDB.

1 - Bower, J., 1998; Inter-war land drainage and policy in England and Wales. *Agricultural History Review* 46(1); 64-80

2 - Marsh Inspectors' Minute Book 1

3 - Braunton and District Drainage Board Minute Book 2

3.4 The Changing Role of the Marsh Inspectors' House

The 'Inspectors' House' appears in the Marsh Inspectors' records of 1839, when the property was first rented for the sum of £6 per annum¹. For the remainder of the century, rental income from the property appears intermittently throughout the Marsh Inspectors' accounts, and it often provided free accommodation for employees of the Inspectors¹. The duties of the employees involved a variety of tasks, such as destroying rats and moles in the banks, checking and controlling water levels, cutting weed, cleaning drains, and impounding escaped stock. The ideal position of the property meant that the resident of the Inspectors' House was commonly paid by farmers to tend livestock on the Marshes^{1,3}, hence the records also occasionally refer to the house as both the 'Herdsman's' and 'Shepherd's Cottage'. To help the herdsman negotiate the many acres of Braunton Marsh, timbers were positioned across the drains and ditches, along with stones or metal pins set at various points within the enclosure walls, creating a network of paths which cut directly over the Marshes².

Towards the end of the Nineteenth Century, the records demonstrate more clearly that a person called William Clarke was the long-standing resident and herdsman at the Inspectors' House⁴. Mr Clarke is quite probably the inspiration behind the so-called Clarks' Road, part of the private, internal roads within the centre of the Braunton Marshes, lying less than a mile away. The enduring name of the road is perhaps testament to the affection held for Mr Clarke as a long-established local figure. William was succeeded by Fred Williams in 1908, a man who remained at the property until 1931⁴.

Since the first reclamation, tolls had been charged for the use of the toll road by anyone who was not a marsh owner, including those accessing the area for fishing and using the ferry when it remained in operation (see section 3.5). Nonetheless, the revenue from these tolls was traditionally small and relatively infrequent. References in the Marsh Inspectors' minutes of 1926 record the need to give notice for the removal of huts, which had been erected 'adjacent to the Ferry House', suggesting that the area was becoming increasingly appreciated for its recreational value⁴. By 1929, it appears that the advent of the internal combustion engine had already begun to change the traditional role of the occupants of the Inspectors' House. Owing to the increased costs of keeping the bank road in repair, a new schedule of toll prices was agreed, and tickets were issued, possibly for the first time⁴. It was agreed that the toll collector should receive three pence for each toll collected, and that no 'motor-lorries' were allowed to use the road without special permission from the Inspectors⁴. Occasional agreements were made for regular users, with five shillings a year being paid by the two keepers of the Crow-Point lighthouse, for access along the road with their motorbike and sidecar⁴.

From 1931, the role of herdsman fell to Mr F Bowen and, during the war years, records indicate that the house continued to be let, free of charge, to a Mr Cecil Summerfield in return for the services he provided to clean out and maintain the drains⁵. During the war, it appears this task was also assisted by Prisoners of War from Germany and Italy^{5,6}. Although the Inspectors' House does not appear to have been requisitioned, war damage contributions were paid out for the property over the three years following the war, until 1948. These payments may possibly have been warranted as a result of damage caused from the considerable increase in the volume of traffic past the Inspectors' House. The RAF and US army vehicles also caused damage to the toll road and to the boundary bank between the Marsh Inspectors' and Christie Estate land^{4,7}. However, the most noticeable difference on the marshes during the war would have been the sound of live firing echoing across from Braunton Burrows during the day, and by night, the illumination of the Braunton Marsh dummy aerodrome, which aimed to divert attention from the real airfield at Chivenor.



Picture by courtesy of Miriam Coleman-Cooke



Picture by courtesy of Miriam Coleman-Cooke



Picture by courtesy of Miriam Coleman-Cooke

Another side effect of the war was the development of further buildings, which prior to WWII, only consisted of the two Marsh Inspector properties, the linhays, and, just beyond the boundary drain, the Christie Estate's farm at South Burrow. During the Second World War, several huts were built on Marsh Inspector land close to the White House⁴. These were reported to have been manned around the clock during the war, with supplies being delivered by a local farmer with his horse and cart⁵. After the war, most of these buildings were removed, but the buildings of a radar station on a marsh called Willowfield can still be seen today, and are now used for holiday accommodation.

After the war, the dual role of Marsh Inspector employee and Herdsman appears to have returned to its familiar pattern once again. From 1949 to 1959, the house was occupied by Mr Fred Smith, along with his wife and two sons⁶. At this point, toll collection remained a minor function of the resident of the Inspectors' house, who would have been more than occupied with his responsibilities to maintain the drains, and to care for up to 1000 head of cattle, along with his own animals⁸. The Inspectors' House had long since included a cart-shed, a pig-house and various other outbuildings, including a salting house and a potato house. Along with a relatively self-sufficient smallholding, it is highly likely that it was a long-established practice for many Inspectors' house occupants to rent and farm some Marshes themselves. This was certainly true in the case of the Smith family, who kept sheep, chickens, cows, and a cart-horse, and had a milking parlour at the side of the house⁶. Fred Smith, one of the sons, explained how the family came to live there, taking over from his uncle and aunt. He describes a childhood, spent with his brother and other friends, fishing for eels, rafting and even swimming in the dykes around the house. As the children grew up, they also helped their father clean the drains manually, and cut the weed and banks with scythes and staff hooks^{6,9}. At this time, even as late as the 1950s, the existence at the Inspectors' House was still very basic. Without a supply of drinking water, water was still collected daily in a 4-gallon churn from a well at Marstage Farm, and clothes were washed in water from the dyke⁶.

Even as the Smith family left the Inspectors' House in 1959, it seems unlikely they would have realised how much the role of those living in the Inspectors' house would change over the next few decades. With more modern technology employed by the new Board, the traditional task of manual drain clearance, diminished. Changes in agriculture and an increase in recreational interests, also found the inhabitants of the Inspectors' House moving away from the role of herdsman and smallholder, to one of toll collector. This enhanced source of income from tolls was fortuitously timed, as the Marsh Inspectors' rights to collect drainage rates from marsh owners were lost after the formation of the new Drainage Board in 1943. Although the Marsh Inspectors still retained the trusteeship of the grazing banks, two-thirds of the income, after omission of various maintenance expenses, was now promised to the new Board.

In 1961, the full-time role of toll keeper was taken on by Dorothy Squires, who remained at the property for the following 21 years. During this time, the increased recreational interest also enabled diversification, and an area was enclosed for the storage of sailing boats, close to the White House. Indeed, since the 1960s, the number of tolls taken has increased many times over, with tolls rising from 10p in 1973, to £1.50 in 2006. Some things never change, however, and for as long as there have been tolls, there have been attempts to avoid paying^{10,11}. It is also a common misunderstanding that the tolls are charged for commercial gain. Ironically, the proceeds continue to help manage and maintain the quality of, and access to, an area enjoyed by the very people that complain. The increase in recreational visitors has created other issues for the Marsh Inspectors, including the death of several sheep, caused by vehicles speeding along the toll road. This led to the installation of speed humps around 20 years ago². Unsympathetic visitors to the Marshes have also made life difficult for farmers moving livestock, and there is concern that visitors' dogs often need to be kept under closer control. These issues highlight the fact that, although recreational interest in the area is important and positive, access must be handled sensitively in order that the landowners can continue to manage the land. Without visitor management, the very qualities that attract people to the area could inadvertently be destroyed.



Picture by courtesy of Maranda Coleman-Cooke



Picture by courtesy of Maranda Coleman-Cooke



Picture by courtesy of Maranda Coleman-Cooke



Picture by courtesy of Maranda Coleman-Cooke

1 - Marsh Inspectors' Minute Book 1

2 - Owen Slade and Rowland Dibble, personal communication, 2006.

3 - An agreement between the Wraughton Commoners, George Newcombe and the tenants of Braunton Marsh Sea Banks, 1844, Braunton Museum, Box 16

4 - Marsh Inspectors Minute Book 2

5 - Braunton and District Drainage Board Minute Book 1

6 - Fred Smith, personal communication, 2006.

7 - Insurance documents for the Marsh Inspectors properties, 1923

8 - Rowland Dibble, personal communication, 2006

9 - Invoice from Fred Smith for weed cutting, 1950 (from the records of the Marsh Inspectors')

10 - Letter from Dorothy Squire to the Marsh Inspectors, 1970 (from the records of the Marsh Inspectors')

11 - Article, Western Morning News; 09. 12. 1960; Strange and sombre attraction of Braunton Marsh, by A. J. Butcher

12- John Hartnoll and Owen Slade, personal communication, 2006.

3.5 The White House

Evidence from the maps of Joannes Janssen of Amsterdam (c1700) and J. Oligby (1760) indicate that a long-established ferry route existed between a position at Bench Hill (the elevated area upon which the White House now stands) to destinations in Appledore and Instow¹. A number of well-used routes, such as that leading from Croyde over Saunton Down, converged on a path to the ferry, following a similar path to the current Yankee Road. Bench Hill was ideally positioned at the mouth of the original Braunton Pill, as it was always accessible, regardless of the tides. On higher tides, it is believed that the ferry might also have been boarded at sites closer to Braunton, accessed via the major tidal guts now known as Flats and St. Arthur's Pill¹. Nonetheless, there is a distinct possibility that a ferry house at Bench Hill existed long prior to the creation of the Great Bank in around 1813, although no records exist to corroborate this idea.



The White House at Bench Hill (then referred to as Oatway's House) came into the possession of the Marsh Inspectors in 1843. From this point, unfortunately, very few details about this property or the lifestyle of the occupants remain. It does appear that the ferry may have continued running until at least 1861⁷, however, the opening of the railway in 1874, would have almost undoubtedly spelt the end of any remaining ferry trade. As with the Inspectors' House, the inhabitants of the White House had facilities for smallholding, and may possibly have rented land on the marshes, or been associated with the gamekeeping of the numerous rabbits on the Braunton Burrows.

In 1942, the White House was requisitioned on behalf of the war department^{2,3}. Anecdotal evidence suggests that it may have been used for ammunition and other military storage, including landmines placed on the beach at Saunton and around the estuary⁴. After the war, the house was apparently in a poor state of repair, and received war damage compensation. In 1952, however, it was once again damaged, this time from an unexplained explosion from across the estuary. Since 1957, the property has enjoyed a more stable existence, under almost 50 years of residency by the Coleman-Cooke family. From this location, members of the family have been witness to many subtle environmental and cultural changes, and are amongst the few who remember the tradition of Williams' Estate tenants, required to devote one day a year to replace stones on the neighbouring Horsey Embankments^{5,6}. This activity is reported to have occurred around Easter-time, in a spirit much like that of Pot Wallowing, which is still practised today, across the estuary at Westward Ho.

1 - Notes of Commander Gammon, various locations, Braunton Museum

2 - Schedule of condition of the Ferry House, Oliver and Sons, 1942

3 - Marsh Inspector accounts 1946-1948

4 - Reginald Ashdon, personal communication, 2006.

5 - Maranda Coleman-Cooke, personal communication, 2006

6 - John Hartnoll and Owen Slade, personal communication, 2006

7 - Plans; 'Heanton Punchardon & Chivenor Marsh - Property of William Williams' 1861, North Devon Records Office, B170/78

3.6 Implications of Post-War Agricultural Politics, and Scientific and Technological Advances

Following war-time food shortages, the 1947 Agriculture Act laid down a number of measures to boost the productivity and efficiency of the UK agricultural industry. Grants and subsidies were offered, helping to stabilise prices, and encourage the adoption of new technologies¹. The post-war ethos led to the tractor becoming a tool central to modern farming techniques. New technology radically decreased the labour demands of traditional farming practices, while advances in veterinary science had further implications for modern animal husbandry. These new innovations were to play an increasingly significant role in both the drainage and the agriculture of the Braunton Marshes.

3.6.1 Marsh Cultivation

The most immediate and noticeable change resulting from post-war governmental policy, was the cultivation of pasture on Horsey Island. This was a significant event, as the pasture of Braunton Marsh was traditionally never ploughed, partly for fear of disrupting areas of the marsh where the alluvial soils provided only a thin cover over unproductive sand. The tell-tale sign of previously cultivated pastures can easily be recognised on the marsh, revealed by an absence of relict tidal guts. Anecdotal evidence, and the fact that the overwhelming majority of land retains these characteristic tidal channels, suggests that cultivation remained restricted to parts of Horsey Island.

3.6.2 Use of Vehicles

The post-war era saw far more agricultural vehicles travelling along the Toll Road, including livestock hauliers for cattle that would have once had to walk all the way to market at Barnstaple. Increased recreational demand, and the traditional role of the tenant of the Inspectors' House as Herdsman, was replaced by the task of toll collection at the end of the 1950s, and the house was increasingly referred to as the Toll House. Livestock were now tended by their owners, who could visit the area far more quickly and easily in modern farm vehicles than in the days of horses and carts. Linhay talets were no longer needed to store feed. Greater use of insect-repelling treatments for cattle also reduced the value of linhays for summer shelter. Combined with increased maintenance costs, the linhays began their slow decline. In 1982, the County Council commissioned a Countryside Study. Following this, a survey of many of the linhays on the Marsh was conducted, and the Braunton Conservation Project was established. The project secured funding which included the production of self-guided walk leaflets covering Horsey Island, the Braunton Great Field and the Marshes. The project included the restoration of some 270m of stone wall across parts of the Christie Estate's land on the Marshes and several linhays, including the eye-catching round linhay, an iconic feature of the Marshes. Several landowners also took it upon themselves to repair and restore several key linhays, still used for agriculture, which were ineligible for grants. Many of the linhays are listed buildings, alongside several of the stiles and the Great Sluice. Sadly, without continued efforts, many of the linhays have continued to decline and will ultimately disappear.



Picture by courtesy of Miranda Coleman-Cooke

EVEN DURING THE COURSE OF THIS STUDY, MARSH LINHAYS HAVE CONTINUED TO DETERIORATE



Picture by courtesy of Miranda Coleman-Cooke

THIS WALL IS NOW ALL THAT REMAINS OF ONE MARSH LINHAY



Picture by courtesy of Miranda Coleman-Cooke

3.6.3 Changing Livestock Farming Practice

Over the five decades following World War II, technological advances resulted in a greatly-reduced number of labourers employed in agricultural work. On the Marshes, traditional cattle grazing continued, albeit in a slightly modified form. In the post-war spirit of increased productivity, UK agriculture typically saw the increased use of artificial fertilisers, enabling lands to be more heavily stocked¹. This national pattern of intensification appears to have been reflected, to a limited extent, across the Braunton Marshes. Anecdotal evidence suggests that many Marshes and the surrounding area have been stocked with greater numbers of animals during the post-war decades, although the precise extent of this is impossible to quantify. Nonetheless, many pastures are today identified as potential Devon County Wildlife sites, together with the existence of two SSSIs on the outskirts of the Marsh. The area is not

contributed to a current increase in sheep grazing. Post-war agricultural science has facilitated this non-traditional practice, following the introduction of drugs to treat liver fluke. Sheep numbers on the marsh have increased particularly dramatically in the wake of the Foot and Mouth crisis of 2001. Although the crisis resulted in the decimation of both cattle and sheep populations, the shorter generation time of sheep had immediate advantages for the purposes of restocking. Since then, the overall sheep population has been higher, although it remains to be seen whether this trend will continue in the long-term. It is important to note that variation in grazing regimes, and stocking intensity, have been linked to changes in the types and abundance of plant species².



Picture by courtesy of Miriamda Coleman-Cooke



Picture by courtesy of Miriamda Coleman-Cooke

AN EXAMPLE OF THE SMALL ENCLOSURES WHICH WERE ONCE MORE COMMON ACROSS THE MARSHES

suiting to intense agriculture, and landowners farming the Marsh and the surrounding area have resisted the full force of economic pressure to adopt farming practices that would have resulted in a widespread and severe loss of biodiversity.

Over the last fifty years, the trend of increased pasture size across the Braunton Marshes has continued. Small pastures of approximately two acres, which might once have contained a few milking cows visited twice daily by their owners, declined and have been replaced by larger herds of milking and beef cattle over greater areas. The extensive length of walls and hedges, which once divided the marsh into tiny pastures, continued to decay alongside the marsh linchays, as the Braunton Marshes were farmed in increasingly large units. The loss of hedgerows seems likely to have been exacerbated by the loss of mature elm trees on the marsh through Dutch elm disease during the 1970s. Throughout the changing landscape of agricultural economics, as the profitability of milking herds decreased, milk production on the Marshes gradually disappeared entirely. Suckler herds of traditional breeds such as Devon Reds or hand-reared heifers became the typical cattle seen in the area⁴. However, today, with continued pressure on British agriculture, mixed continental breeds have largely replaced traditional British varieties.

More recently, livestock numbers have once again declined in line with the demand for British beef. The previously-flourishing market was devastated by BSE during the mid 1990s, and exacerbated further by the Foot and Mouth epidemic of 2001. British farmers, faced with the pressure from supermarkets to compete with cheap imports, have found it increasingly uneconomic to continue beef production, and this has

Falling market prices for both sheep and cattle, together with CAP reforms decoupling farm subsidies from a 'per-animal' basis to a single payment, meant that, last year, parts of the Braunton Marshes were not grazed at all. Partly due to economics, and partly due to the late spring of 2006, pasture which was famed for cattle fattening over two centuries, was therefore simply cut for hay and left un-stocked. Hay production has not traditionally been a wide-spread practice across the Marshes, with preference for continual grazing. Additionally, it is difficult to cut grass on the undulating surface of the pastures, or to dry the hay sufficiently with a water-table so close to the land surface³. The wildlife of the Marsh is intrinsically linked to the agricultural practices decided in response to external economic pressure. With the current challenges facing UK agriculture, and some of the most significant departures from historic practices occurring in recent years, perhaps the greatest divergence from traditional farming on the Braunton Marshes is yet to be seen.

1 - McNerney, J., 2002; The production of food; from quantity to quality. Proceedings of the Nutrition Society 61; 273-279

2 - Stewart, G.B. and Pullin, A.S. (2006). Does sheep-grazing degrade unimproved neutral grasslands managed as pasture in lowland Britain? Systematic Review No. 15. Centre for Evidence-Based Conservation, Birmingham, UK.

3 - Richard Dyer, personal communication, 2006

4 - John Hartnoll, personal communication, 2006

4 Water Level Management

Essentially, the drainage system of Braunton Marsh operates by means of gravity, with the subtle gradients of the clay-lined water channels directing water around the marshes. Water exits the Marshes via the Great Sluice at Horsey Island. During the summer, some water enters the system at Velator, via the River Caen¹, however the primary source of water entering the system comes from a spring situated in an area known as the 'Meres' or 'Mares' to the north. During the summer of 2006, dry conditions meant that this spring was barely flowing, yet the drains were relatively full, suggesting that the system is also fed by other springs, and from water draining from the Braunton Burrows dune system to the west². Following the re-profiling of the boundary drain by the IDB in the late 1980s, there were concerns that this act may have contributed to a reduction in the water table of Braunton Burrows. This hypothesis was investigated through the preparation of a draft Environment Agency Water Level Management Plan¹, however results as to the cause of this reduction were inconclusive. Elsewhere, across the estuary, Northam Burrows has also suffered a reduction in its water table in recent years.

The numerous drainage controls of the original system remain scattered across the Marshes, typically in the form of simple weirs adjusted using wooden boards, which are either inserted or removed to raise or lower the water levels in the drain. Elm is the wood traditionally used, owing to greater resistance to rotting when continually exposed to water. Historically, some controls were used to shut off and empty sections of the drains during manual clearance of drains, but only a small number of controls are still used today. Four major controls are currently used to adjust the water levels between higher summer levels and a reduced winter regime. Lower winter levels can help clear excess weed from the drains during times of hard frost, however, a faster flow rate and a comparatively high winter level, which is more favourable for wildlife, are currently being practised. Minor adjustments in water level are made at three other small controls.

Although a visitor might instinctively think that the main purpose of the Drainage Board was concerned with land drainage and flood prevention, the area within the control of the IDB floods extremely rarely. Instead, the control of water levels is primarily for the purpose of livestock farming, both with regard to ease of drinking, and in order to keep the animals on different pastures apart. Essentially, this purpose is very different from the flood and coastal defence objectives of the Environment Agency, which retains discretionary powers over the 'main river' of St. Arthur's Pill and the sea defences including the Great Sluice³. Over the years, the central drainage authority (now the Environment Agency) has been subject to reorganisation and new legislation, which has sometimes led to a discontinuity of effective communication and cooperation with local landowners and the IDB. Braunton IDB decisions regarding the adjustment of the water levels, or conducting maintenance work, are made after the expert consideration (and expertise) of the Board, whose Members have been consistently and closely involved with the day-to-day and long-term observation and management of the Braunton Marsh environment. Many Board Members have in the past, and continue to be, made up from individuals who have farmed, or have been associated with, the Marshes for much of their adult lives, or even since childhood.

Drainage and water level issues within the Marshes are either considered at quarterly meetings, or raised at the Annual General Meeting which is open to all marsh owners. Traditionally, the management and control of water levels on Braunton Marsh were the responsibility of the Inspectors, and generally fell to the employee living in the Inspectors' House. With the advent of the Braunton & District Drainage Board, and the role of the Inspectors' House resident changing from herdsman to toll keeper, water-level management now relies upon the good will of individuals within the Drainage Board. Today, it falls to Board members to volunteer their time and expertise to monitor and adjust the controls as necessary, performing tasks such as the closing of the penstock at Velator on high spring tides, which ensures that the drains are not contaminated with salt water.

1 - Environment Agency, 1998; Water Level Management Plan, Braunton Marsh

2 - John Avery, personal communication, 2006

3 - Ministry of Fisheries and Food, 1999; High level targets for flood defence and elaboration of the Environment Agency's flood defence supervisory duty. Flood and coastal defence with emergencies division. (From the records of the IDB)



THE GREAT SLUICE



5 Habitats and Species

The environmental value of the Braunton Marsh and surrounding area has long been recognised. The undulating pastures, the hedgerows, and the drainage ditches of varying depths and widths, provide several different types of habitat, and support a wide variety of species. The conditions provided by the relict tidal guts are particularly important, as they provide damper conditions for wetland plant communities, which are increasingly threatened across the UK. The channels provide cover for many resident birds, and the area is also an important feeding and breeding ground for many species. The Marshes also comprise an important wildlife corridor, maintaining a connection between the various designated areas and other adjacent habitats.



5.1 Habitats

Historically, the value of the area as a feeding ground for birds, and the ecology of the freshwater channels, were acknowledged under a wide-scale Tav Torridge Estuary SSSI designation until the late 1980s. Despite this designation, however, it is understood that few studies have ever been undertaken to quantify the ecological significance of the Marsh. As such, it is almost impossible to determine how much the Marsh has changed over time. However, a limited number of fragmented species lists and survey records of a small range of taxons, do exist within the archives of Natural England, largely associated with the ecology of the drainage ditches^{1,2,3,4,5}. In spite of this limited ability to quantify ecological change, much of the Marsh was de-notified in 1988, on the grounds that parts of the pasture had suffered a reduction in biological diversity following agricultural improvement. Detailed records of this process are unavailable; however, many Marsh pastures have since been identified as potential Devon County Wildlife Sites, but their fulfilment of the habitat criteria remains unconfirmed. Habitat on the neighbouring Horsey Island was confirmed as a County Wildlife Site in the mid 1990s¹⁶. The records of this assessment may help to suggest the potential biodiversity that might be found across the Braunton Marsh area as a whole. However, since this time, the habitat on Horsey Island has been subject to changing agricultural practices and increasing salt inundation over the past few years due to a faulty sluice, providing a more transitional saltmarsh environment. Anecdotal reports suggest that many freshwater species are now in decline across many parts of Horsey Island⁹.

Remaining areas of unimproved pasture, containing the highest concentration of ecological interest and botanical diversity, were designated and purchased as individual SSSIs at the time of de-notification. These are situated at Swanpool, and Greenaway and Freshmarsh. Details are available through Natural England. Swanpool is situated to the north of the Marsh, and despite sharing certain similarities, remains a habitat distinct from that of the former saltmarsh. However, parts of Greenaway and Freshmarsh SSSI fall within the area of Braunton Marsh itself. Unfortunately, extrapolation of the types of species found within



the Greenaway and Freshmarsh SSSI remains one of the few ways to evaluate which species may still be found within the rest of the Marsh pastures today. It is anticipated however, that notable Devon species such as the Parsley Water Dropwort (*Oenanthe lachenalii*) and the Marsh Arrow Grass (*Triglochin palustris*), found in few other parts of the county, are likely to be found amongst the herbs of some Marsh pastures, much as they are in the SSSIs nearby⁸.

The citation sheet of Greenaway and Freshmarsh SSSI states that the areas represent some of the last remaining fragments of herb-rich grazing marsh in the county. The rest of the Marshes, however, also represent the same type of coastal and lowland grazing marsh, which is identified as a priority habitat under a UK Biodiversity Action Plan (UKBAP). Details of coastal and floodplain grazing marsh can be found on the UKBAP website⁶, and it is a habitat that has become increasingly rare following habitat loss since WWII. Grazing Marsh is also identified as a priority habitat within the Devon BAP⁷, owing to its scarcity within the county. Indeed, only in 1997, some 40 acres of highly biodiverse grazing marsh were ploughed up on Horsey Island⁷. The marsh waterways also contains UKBAP stream and river habitats, and UKBAP reedbed habitats⁶, such as those found at the former major tidal guts of St Arthur's and the Inner Marsh Pill. The hedgerows which divide the Marsh also constitute an important habitat identified by the North Devon BAP.

The Braunton Marshes also provide an important habitat in terms of bird life, including many species of conservation concern (Appendix 11). The area is very popular with birdwatchers, and is included under the RSPB Important Bird Area designation. Anecdotal evidence from local birdwatchers and landowners suggests that birdlife on the Marsh has varied significantly over the years. Species such as Golden Plovers and Lapwings, were once far more abundant than can be observed today^{11,12}. There is much speculation about what may cause these reductions in population size, ranging from disturbance by visitors, dog walkers, shooting, overstocking, climatic variation and increased predation from species such as mink, foxes, and magpies. It is also suggested that a marked change in the rate of declining bird numbers over the estuary as a whole coincided with the decommissioning of the power station at Yelland¹⁵. The power station is thought to have previously provided a particularly favourable, warmer estuarine environment, which helped to attract birds into the area. Simultaneously, however, other species such as Canada Geese and Egrets are reported have become more prevalent in recent decades^{9,13}.

Records from local ornithologists and local groups such as the Devon Birdwatching and Preservation Society, and national organisations such as the Wetland Bird Survey, provide a useful source of information covering the last decade or so. The Braunton Marsh Shooting Syndicate, which is permitted to feed and shoot any species of bird within the area of the former Williams' Estate shooting grounds, is also a potentially useful source of information. The self-policed syndicates, which have experienced a surge in popularity in recent years, provide accurate records of the number of wildfowl taken during each season for the last few decades. However, although one unconfirmed report suggests a Williams' Estate game-book containing information about bird numbers dating back to the turn of the century may still exist, most of the available data is recent in nature. Combined with natural fluctuations in bird populations according to climatic patterns, the relatively short-term nature of available data means that verification of any long-term trends or their causes is likely to be very difficult. However, such an attempt is undoubtedly warranted on the ground that, if fruitful, it would provide valuable guidance and justification for future initiatives for bird conservation across the Marsh.

5.2 Species

Within the priority habitats contained in the Braunton Marsh, several locally, nationally, and even internationally important species have been identified. Species listed in Devon Biodiversity Action Plans (BAP) include Curlews (*Numenius arquata*), the Great Green Bush Crickets (*Tettigonia viridissima*)⁸ and Barn Owls (*Tyto alba*). In the past, owls were reported to have once been numerous inhabitants of the Marsh lincays, and several species of owl have been observed in recent years⁹. However, it is believed that the overall decline in owl numbers coincided not only with the decline of the lincays, but also with the decline of water voles (also a UKBAP species), possibly as a result of an increase in predation by mink. In recent years, there are only unconfirmed reports of water voles (*Arvicola terrestris*) remaining in the area. Greater Horseshoe Bats (*Rhinolophus ferrumequinum*), known to forage and roost on the Braunton Marshes¹⁰, represent another Devon BAP species, and are also covered by UKBAP status. Records of the Devon Wildlife Trust suggest that Otters may also frequent the Braunton Marsh from time to time. Otters are the highest-profile species to be found on the Marshes; they are subject to a UKBAP and are protected under the Wildlife and Countryside Act 1981 and the European Habitats and Species Directive, and are also listed as vulnerable under the IUCN Redlist, 2000.



Today, in addition to the fragmented records and survey work already mentioned,^{1,2,3,4,5} many species recorded within the habitats across the Braunton Marsh have been collated within National Biodiversity Network (NBN) 10km² datasets for various taxons. In some cases, the datasets can then be broken down into more specific locations. Unfortunately, however, such locations are often protected, unspecified, or vague, making it difficult to produce a comprehensive list. This is compounded by varying interpretations as to the boundary of the 'Braunton Marsh', which sometimes refers to areas beyond the original extent of the saltwater marsh. Nonetheless, an attempt has been made to collate non-exhaustive species lists for the birds, mammals and plants likely to be observed on the marshes, using the NBN records, existing survey work, and with the help of local experts. (Appendix 11, 12, 13).

It appears that the most detailed survey yet undertaken of the Braunton Marshes was conducted by the Environment Agency in 1996⁴. The limited study sampled plant and invertebrate species at eight sites across the Braunton Marsh and surrounding area as far as Swanpool. Exceptional floral diversity, and several unusual dragonflies, molluscs and beetles with regional or national conservation designations, were identified at a site along the Inner Marsh Pill, and on sites along the boundary drain close to the Great Sluice and Pedricks' Lane^{4,5}. In 2005, the invertebrate survey component of the study was replicated on a smaller scale, and it was found that the levels of macro-invertebrate diversity varied widely from that observed in 1996. The influence of drain clearance, which operates on an approximately three-year cycle, is likely to be a significant contributor to this variation in observed biodiversity. Similarly, farming practices, such as the presence or absence of fences adjacent to the ditches, is also likely to influence the form and level of biodiversity in the area. Across the marshes, farmers manage their land in different ways, providing variety in the form and condition of the drain edges. The implication for biodiversity of soil poaching along the drain edges is not well understood. The current variation in fencing practices across the Marshes is likely to provide a wide range of ecological conditions, providing habitats for a greater number of species. Confirmation of the optimal management of the drain edges may provide scope for further investigation in the future.

5.3 Management

Several organisations currently play a part in the environmental management of the Marshes. The Environment Agency has a statutory responsibility to ensure the water quality of the main rivers, thus influencing the biodiversity of the drains. In accordance with their 2002 policy statement, the Braunton Internal Drainage Board aims to 'ensure no net loss of habitats covered by Biodiversity Action Plans, monitoring any gains and losses, and reporting annually to the Environment Agency' and to 'take appropriate opportunities to enhance habitats'. The Braunton and District Drainage Board is one of the central tools for direct local management of wildlife in the area. In recent years the Board has encountered significant threats to the wildlife of the Marsh drainage channels, owing to the occurrence of an invasive species of water fern (*Azolla filiculoides*). Fortunately, this invasive weed now appears to be under control, but, it has been replaced by a new threat from the species *Myriophyllum aquaticum*, commonly known as Parrot'sfeather. This invasive pond weed is currently being managed through a system of herbicides and mechanical removal.

Under the national, regional and local BAPs, partnerships between various agencies also aim to encourage management through schemes to promote the conservation interest of priority habitats. In the case of the Braunton Marshes, uptake of Environmental Stewardship Schemes by landowners is one of the main routes for the implementation of BAPs, providing a contractual agreement for farm management with the aim of promoting wildlife specific to the area. A recent surge of entry into such agreements will therefore help ensure the economic viability that is an essential precursor for the promotion of environmentally-sensitive farming practices. However, it is unclear what economic incentives will remain once these agreements expire after 10 years. Other voluntary initiatives have also been undertaken to conserve species such as Barn Owls in the area. This year, the Braunton Marsh Shooting Syndicate also reintroduced a number of Grey Partridges (*Perdix perdix*), a native species which had not been seen on the Marsh for over a decade¹³.

Preservation of wildlife interests, wherever possible, is certainly an aim shared by the landowners and the Braunton and District Drainage Board alike. Yet it is important to realise the practical and economic implications of pursuing such goals proactively, and the need for expertise and funding to achieve them. As can be concluded from the above paragraphs, there continues to be a requirement for a more systematic and comprehensive evaluation of the environmental resources found on the Braunton Marshes. This would undoubtedly prove beneficial for targeting future environmental management in the area.

1 - Coleopterist Newsletter, 1987; Records of Natural England, Exeter Offices

2 - Wolsey, F. A., 1988; Assessment of botanical contents and value of waterways of Braunton Marshes (2 day survey). Records of Natural England, Exeter Offices

3 - Gough, H. K., 1987; An interim report of a macro-invertebrate survey of the Braunton Marsh Area. Records of Natural England, Exeter Offices

4 - Knight, L., 1997; Braunton Marshes Conservation Survey 1996. Environment Agency. Devon Area Internal Report.

5 - Devon Area Ecological Appraisal Team, 2005; Braunton Marshes Biological Survey. Environment Agency. Devon Area Internal Report.

6 - www.ukbap.org.uk

7 - Devon Biodiversity Action Plan – Grazing Marsh

8 - Mary Breeds, personal communication, 2006

9 - Maranda Coleman-Cooke, personal communication, 2006

10 - Billington, G., 2002; Radio tracking study of greater horseshoe bats at Caen Valley Bats Site of Special Scientific Interest. English Nature Research Report number 495

11 - John Hartnoll, personal communication, 2006

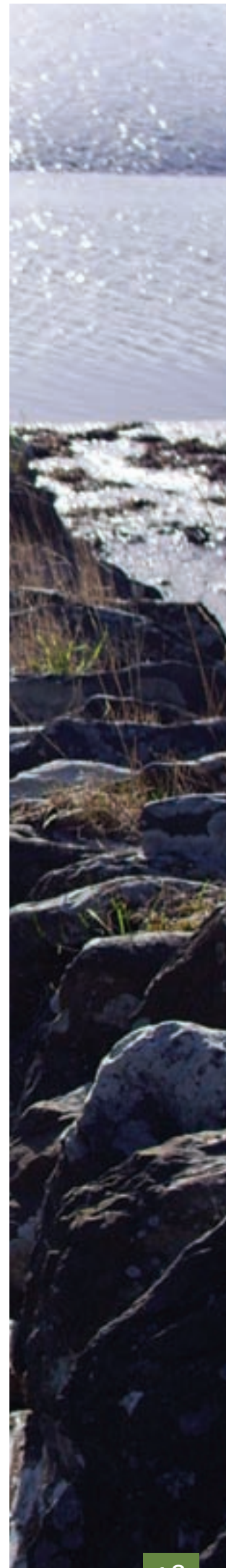
12 - Rowland Dibble, personal communication, 2006

13 - Lesley Oldham, personal communication, 2006

14 - Braunton Marsh IDB policy statement on flood protection and water level management, 2002

15 - Northern Devon Coast and Countryside Service, 1998; Taw Torridge Estuary Combine Issues Report

16 - Devon Biodiversity Records Centre – Devon Wildlife Trust Site Survey Cards for Horsey Island



6 Future

6.1 Local Development

Naturally, the future of the Braunton Marshes will be shaped by the external pressures of the coming years. As previously mentioned, the historic agricultural landscape on which the Marsh wildlife depends has, and continues to be, influenced by changes within the agricultural industry as a whole. Alongside this changing agricultural context, environmental resources have become increasingly valued, albeit at odds with the intensely competitive market forces, which continue to drive down the wholesale price of agricultural produce. With narrowing profit margins, schemes such as Environmental Stewardship are helping to marry together the two contradictory forces, together with an emphasis on farm diversification across the UK. On the Marshes themselves, only the future will reveal what impact these influences will have in the long term.



Picture by courtesy of Miranda Coleman-Cooke

It is already evident that the area has become increasingly important for its recreational value through the last century, and the North Devon tourism industry continues to flourish. On the Marshes, there is a strong feeling by landowners that increasing visitor numbers and a demand for extended recreational access must be moderated relative to environmental and agricultural concerns. Today, visitors have access to the fringes of the Marsh via the Toll Road, and the public road adjacent to the great field, known locally as the Braith. Visitors can also use the coastal path which runs along the embankments beside the Braunton Marsh pastures, and the car parking area close to the White House, which also provides access to Broadsands, Crow Point, and to Braunton Burrows. There are concerns by landowners, however, that a significant increase in popularity would destroy the tranquillity that makes the Marsh so special and would create further disturbance to wildlife and livestock alike. As such, any moves to promote the area actively, or to encourage extended access to the internal areas of the Marsh, are likely to prove unpopular.

A further implication of the tourism industry has been the use of the public road skirting the Marsh as a local “rat-run”. The overall increase in traffic during the summer months led to proposals over a decade ago for a Braunton Bypass, which would pass along the edge of the Great Field. Fortunately the proposal was turned down at a public enquiry¹. The current Braunton and Wrafton Action Plan contained within the North Devon Local Plan 2006 states a clear policy against any development which would harm the archaeological heritage or setting of the Great Field. However, with the opening of the Barnstaple Western Bypass and Downstream Bridge in 2007, there are fears that the traffic problems faced in Barnstaple will relocate in Braunton, and may consequently result in renewed calls for measures to reduce summer congestion in the village. With the maintenance of existing policies, it is unclear what alternative options might be available. However, the impact on the Marshes must be carefully considered and consulted upon during any future developmental policy reviews.

6.2 Climate Change, Shoreline Management Plans and Estuary Modelling

Natural climatic and geological processes have resulted in a gradual sea-level rise in the South West since the end of the last Ice Age, and it is now widely believed that this sea-level rise is likely to accelerate in the coming century. The intensity of rainfall and windstrength is predicted to increase, along with Atlantic storms producing increasingly powerful waves. Historical development and sea defences have often served to enhance the current impact of sea-level rise, reducing the overall area over which the tidal waters and energy might otherwise be dispersed. Human development has been particularly focused around estuaries due to the services that estuaries can provide, resulting in the loss of many of the natural coastal systems that would otherwise help to mitigate the effect of climatic change. Over the past decade, nationwide Shoreline Management Plans (SMP) have been developed to determine a strategic framework for dealing with the sea-level rise and climatic changes that will increasingly threaten vulnerable parts of our coast. Such strategies include the restoration of natural estuarine systems, where appropriate, in order to reduce the overall risk to more economically significant developments, such as houses and businesses.

With regard to the Braunton Marshes, although embankments held under the trusteeship of the Marsh Inspectors stretch from Velator to the White House, the most significant embankments with regard to sea defence are those at Horsey Island. Unlike the sheltered embankments of the Braunton Pill, the Horsey Island embankments are more exposed and, as mentioned in earlier sections, required reinforcement soon after their construction. The storm of 1910 served to indicate the potential devastation and financial implications when serious damage to sea defences occurs.



THE EMBANKMENTS WERE ONCE ENTIRELY COVERED BY INTRICATE STONE COBBLES



TIDES ERODE BENEATH MODERN CONCRETE REPAIRS

At the time of the Storm, the Horsey Embankment, which receives the brunt of the tidal energy, was owned by wealthy landowners, and the embankment was traditionally maintained with the help of estate tenants. However, the construction and maintenance of sea defences have become increasingly uneconomic, particularly with the increases in labour and material costs during the Twentieth Century. Although the Horsey Embankments remained the responsibility of the landowner in the latter half of the Twentieth Century, it appears that, for a while, the maintenance was also supported by the local water authority. Since this support ended, the expensive task of maintenance has once again become the sole responsibility of the landowner. Today the stone facing, which helps to diffuse the tidal and wave energy, has been washed away in many places. The modern use of concrete reinforcement has proved wholly ineffective, as the tide has simply continued to erode beneath the repair materials. It now appears that parts of the coastal path which run along the top of the Horsey Embankment, maintained by the Northern Devon Coast and Countyside Service, are beginning to subside. The increasing refusal of cattle to drink from the freshwater ponds on Horsey Island over the past two decades suggests salt water intrusion across the embankment is now a problem. In the last year, a problem with the sluice at Horsey Island has also resulted in a return to a tidal regime along the old river channel, and a shift in many areas towards a transitional, brackish-water habitat.

A draft SMP produced in February 1998, suggested that Horsey Island should be deliberately breached, on the grounds that this was the 'only viable long-term option on economic grounds'. As Horsey Island is already an important area for over-wintering birds, the investigation of a retreat option was supported by the RSPB. However the historical significance of the area and the existing resistance capabilities of the Great Bank, which would then become the main sea defence protecting the Marshes and the Great Field, were highlighted by the Braunton Marsh IDB. The original stone facing, which reinforced this Great Bank, was removed following the reclamation of Horsey Island (Appendix 6), and as such, the embankment is now comprised of little more than soil and clay. The SMP pointed out that a far more detailed examination of the technical, economic and environmental implications of breaching the Horsey Island Embankment would be necessary. The final version of the SMP² eventually recommended that the cobbled Horsey Embankment should be observed and monitored.

The most significant move towards this goal of observation and monitoring has occurred within the past year, through the commissioning of a coastal management study by the Taw Torridge Estuary Coastal Officer working group. The study includes geomorphological modelling of the estuary, and the production of a predictive model to indicate the future response of the estuary to climate change. A review of the existing flood and coastal defence systems, including function, performance, condition and residual life, is also anticipated, and is likely to have implications for the recommendations of subsequent SMPs. Ultimately, the Environment Agency and the Local Authority hold the powers of coastal defence, and should the Horsey Embankment be breached, it remains to be seen who would finance any subsequent reinforcement of the Great Bank.

1 - Department of Environment, 1993; Braunton and West Coast Local Plan: Inspectors Report

2 - North Devon and Somerset Coastal Group, 1997; Bridgewater Bay to Bideford Bay Shoreline Management Plan



Picture by courtesy of Maranda Coleman-Cooke

FLOODING OF HORSEY ISLAND DURING SEPTEMBER SPRING TIDES, 2006

7 Overview of Current and Future Marsh Management

The Braunton Marsh was developed through the foresight and capital investment of the landowners and farmers of Braunton parish to create a landscape able to produce high quality food for the British public. Since reclamation, Braunton Marsh has been shaped and maintained by cattle grazing, for which the area is famed. The traditional system of farming has produced a wide variety of habitats, which in turn have resulted in the rich wildlife and varied plant populations we see today, and it should be respected and acknowledged for this. The interests of the Braunton Marsh are best served by the continuation of the established farming practices employed by the marsh owners and tenants, combined with the efforts of the Braunton Marsh Internal Drainage Board (IDB) and the Marsh Inspectors.

On behalf of the Taw Torridge Estuary Forum (TTEF), this study has aimed to provide an insight into the historical, social, environmental and economic development of the Braunton Marsh up to the present day. The Marsh is a multifaceted landscape of high aesthetic value, and incorporates a unique local history of human enterprise, engineering and agriculture. Although those local people who are familiar with the landscape may inadvertently take it for granted, the special character of the Braunton Marsh, and its network of narrow drainage ditches and numerous linhays, is something that can be found nowhere else. In the course of the report-writing process, a limited range of concerns for the future of the area have been identified, together with many opportunities to celebrate this special landscape. These concerns and opportunities are described below, together with a summary of current Marsh management. It is important to note, however, that this short-term, stand-alone project has been conducted on behalf of an organisation without direct influence over the management of the Marsh, nor does the TTEF have the financial resources to support future actions. It is also significant that the Marsh is a collection of Marshes under multiple-ownership, and is without a single management body. As such, the achievement of any subsequent management objectives will ultimately be governed by the actions of the Braunton Marsh landowners, various other organisations, and the availability of any necessary funding.

7.1 Marsh Management

The Braunton Marshes are managed primarily through the actions of three major stakeholders, namely;

- The Marsh Landowners
- The Braunton Marsh Internal Drainage Board
- The Marsh Inspectors

The management of the Marsh drainage system is carried out by the IDB, and includes the maintenance of many of the key archaeological features and systems of the marsh. The management of the communal lands of the marsh owners, including the embankments, internal roads and residences, is held under the trusteeship of the Marsh Inspectors. Both systems of management are secure, ensuring the stable maintenance of many of the characteristic elements of the Marsh. The Board Members of the Braunton IDB and the Marsh Inspectors are elected from amongst the Marsh landowners. All Marsh owners pay drainage rates to the IDB and are invited to an annual meeting of the IDB. Given the ongoing communication of the IDB with the landowners, and the significance of landowner cooperation for the overall success of any management initiatives, the IDB seems an obvious management body to assist with the consultation process for any future policies or actions.

7.2 Environmental and Cultural Heritage

Evidently, the Braunton Marsh and surrounding area make up a complex landscape of intrinsic historical, cultural and environmental importance. Since reclamation, the environmental and archaeological heritage of the Braunton Marshes has arisen in response to the primary use of the land for cattle grazing. The drainage system is managed for the provision of drinking water for these cattle, and the linhays were constructed and maintained for the purpose of sheltering cattle. Both the drainage ditches and the linhays have, in turn, provided environments in which wildlife

can flourish, along with the floral diversity and birdlife found within the permanent pastures maintained by cattle grazing. As mentioned in section 3.6, ongoing changes in general agricultural practices have led to a decline in the linhays, and to changes in the grazing regime. These subtle changes have implications for the environmental and cultural resources within the Marsh landscape. The economic viability of continued traditional farming practices, therefore, remains the central component for the optimal maintenance of these features. The Braunton Marshes constitute a unique environment, in which successful management initiatives should appreciate the inherent link between important habitats and species, the cultural heritage and agricultural economics.

In view of the concept that the traditional agricultural practices carried out by Marsh farmers should be supported for the benefit of wildlife and for the cultural interest on the Marsh, three key objectives have been identified that would contribute to this goal;

Objective:

- a) To support the British beef industry, including the purchase and consumption of local produce.*
- b) The verification, quantification, and ongoing monitoring of Marsh Biodiversity.*
- c) To protect the priority species and habitats of Braunton Marsh, together with the characteristic landscape features, particularly the linhays and enclosure boundaries.*

a) To Support the British Beef Industry, Including the Purchase and Consumption of Local Produce.

The strength and profitability of the British beef industry is the cornerstone of the future of the economic agricultural activity on the Marsh, and the wildlife that depends on it. As such, the British beef industry should be promoted wherever possible. A strong market for British beef would provide a real and ongoing incentive for the continued farming of cattle on the Marshes, which has featured so strongly in creating and maintaining its existing character. While many consumers may wish to buy British beef, and to support the ability of this country to produce its own food wherever possible, it is felt that issues such as the clear, transparent labelling of food requires further attention at a national level. The poor prices received for wholesale produce relative to the price paid by consumers at the supermarket is also a significant problem. Local branding initiatives may offer one opportunity to address both of these issues at a local level. In recent years, there has also been a growing consumer awareness that buying local produce not only supports the local economy but may also help to reduce food miles. The Braunton Marshes have, for over 150 years, held a reputation for producing high-quality beef. The Marshes have a strong individual identity, and clearly fall within the UNESCO International Biosphere Reserve buffer zone, owing to its position immediately adjacent to the Biosphere Reserve core area of Braunton Burrows. In view of these characteristics, the Marshes seem ideally poised to lend themselves to local produce initiatives, such as those of the North Devon Marketing Bureau, the North West Devon Economic Partnership 'North Devon Alive' brand, and the suggested development of a 'Biosphere Reserve' brand. The TTEF would be willing to act as an intermediary between local Marsh producers and the promoters of any such initiative in the future.

b) Verification, Quantification and Ongoing Monitoring of Marsh Biodiversity.

As described in section 5, the Marshes contain several priority habitats and important species. However, the monitoring of wildlife interests remains intermittent, fragmented and incomplete. Even in recent times, despite several calls for further systematic studies of Marsh wildlife, no resources have so far been forthcoming, and the assessment of biodiversity across the Marshes remains poor. Identification of any Marsh management requirements and the evaluation of the success of management initiatives will obviously be inhibited by a lack of underlying knowledge, or baseline data. For example, the impact of recent changes in the grazing regime, the optimal variation in poaching levels along the drain edges, and the long-term significance of changes in bird population are all unknown. In view of such changes, it is felt that a greater degree of monitoring would be of long-term benefit for the guidance of future management.

Suggested action:

Assessment of Potential County Wildlife Sites.

Surveying the potential County Wildlife Sites within the Marsh may represent one possible opportunity to determine the biodiversity within the Marsh pastures. It is felt that Devon County Council should be encouraged to prioritise the assessment of these sites. The cooperation and consent of land-owners should be encouraged, and it is felt that the IDB holds a strong position to support this. The assessment of biodiversity may also help to increase eligibility for land-management grants, such as Environmental Stewardship.

Establishment of Regular Survey Work through Voluntary Community Involvement /Educational Groups.

The 2002 policy statement of the IDB contains two specific aims, i.e. to 'ensure no net loss of habitats covered by Biodiversity Action Plans, monitoring any gains and losses, and reporting annually to the Environment Agency' and to 'take appropriate opportunities to enhance habitats'. In line with this policy, the coordination of volunteer surveys of flora and fauna has the potential to provide greater qualification of the environmental resources across the Marsh. This monitoring might be achieved through a liaison with local schools and colleges, or through the volunteer networks of existing organisations, such as the Devon Wildlife Trust and the North Devon Coast and Countryside Service. According to practical constraints and the wishes of landowners, such activities would almost certainly be restricted to pre-determined areas although, through liaison with the IDB, it would be hoped that such issues would be quite straightforward to resolve. Universities may also wish to conduct research based upon the Marsh and, again, this could be facilitated through the IDB.

c) To Protect the Priority Species and Habitats of Braunton Marsh, together with the Characteristic Landscape Features, particularly the Linhays and Enclosure Boundaries.

The historic Great Sluice continues to be positively managed through the IDB and the Marsh Inspectors, whilst the stiles running along the route of the North Devon Coast Path are maintained by the Northern Devon Coast and Countryside Service. The Great Sluice and three of the stiles, together with their flanking walls, are Grade II listed. The Marsh has over thirty linhays, nine of which are Grade II listed. Despite repeated concerns, features such as the linhays, both listed and unlisted, and the enclosure boundaries which evoke the history and culture of the Marsh, have continued to decline following agricultural changes in the latter half of the Twentieth Century. The future of the Marsh linhays, together with the dividing walls and hedgerows, is linked to the pressure and direction of the agricultural industry. Without specific funding, it seems likely that the decline of these buildings will continue, resulting not only in a loss of both the archaeological and cultural heritage, but of the wildlife interest, such as the owls, which have been acknowledged as having inhabited most Marsh linhays in the past. Similarly, agricultural changes potentially threaten to reduce floral biodiversity through pasture improvements and altered grazing regimes, and more must be done to quantify this threat. Financial support is also required to support traditional farming practices for the benefit of wildlife.

Suggested action:

Investigation of Long-term Funding Streams Available for the Conservation of the Environmental & Cultural Heritage of the Marsh.

Ongoing or long-term funding streams would ideally offer the best security to ensure that structures such as the linhays remain a central feature of the marshes, and that traditional farming methods are maintained regardless of the pressures within the farming industry. Naturally, as long-term schemes require large sums of money, such schemes are invariably operated through government agencies. Currently, Defra schemes seem to offer the longest-term funding opportunities, however, even here, it is clear that funding is a finite resource. While many Marsh farmers are now participating in the Defra Entry Level Stewardship scheme, this does not include specific environmental targets for discrete areas of land. However, Defra's Higher Level Stewardship (HLS) scheme aims to: *'deliver significant environmental benefits in high priority situations and areas. HLS is discretionary and concentrates on the more complex types of management, where land managers need advice and support and where agreements need to be tailored to local needs.'*

Under the 2005 Targeting Statement for the area of Exmoor, which includes the Braunton Marsh, the characteristics of the Marsh score highly against Defra key targets for the area. These targets include the maintenance of priority habitats and species, and the conservation of archaeological features, including walls and historic farm buildings. In an area such as the Braunton Marsh, however, individual applications for pastures would be unlikely to fulfil sufficient key targets to be successful, and despite supporting the aim to conserve the wildlife and the cultural heritage on the Marsh, many farmers may be reluctant to become involved in the scheme over their whole farm. A joint HLS application between multiple farmers might be a possibility, although the process is complex, and it is unclear who might coordinate such an application. Whilst the HLS scheme should theoretically provide the ideal solution for the Marshes, the system has unfortunately been subject to administrative problems, and is regarded by many as overly complex and bureaucratic. It is hoped that current problems and short-comings will be rectified in the coming years, and that funding will continue to be made available through a scheme with similar objectives for environment and culture.

Investigation of Alternative Sources of Funding/ Expertise/Volunteers.

The aim to preserve the environmental and cultural heritage on Braunton Marsh also suggests future projects might be eligible for funding through sources such as; Awards for All, Heritage Grants, Community Grants, English Heritage Grants, The Viscountess Boyd Charitable Trust and The Claude and Margaret Pike Woodlands Trust, amongst others. Although such sources are likely to offer funding only on a one-off basis, they may offer scope to develop a carefully-targeted project for the benefit of the Braunton Marsh nonetheless. This might perhaps take the form of the restoration of the linhays, or the establishment of ongoing initiatives, such as volunteer or community schemes that might offer more sustainable, long-term solutions including maintenance or monitoring. Natural England, or other advisory bodies, might be able to suggest the best methods for the restoration of the linhays. It should be noted, however, that previous grant schemes have insisted on the use of authentic materials, such as slate tiles, whose high value has led to theft from newly-restored linhays. Hence linhays repaired through grants allowing cheaper, but visually-similar materials, have often fared better in the long-term, highlighting the importance of learning from past experience. It might also be possible to involve volunteer groups associated with traditional rural skills to help maintain the linhays and walls.

Monitoring the Status and Condition of Buildings on the Braunton Marshes.

This study has produced a photographic inventory of the current condition of the Marsh linhays, together with any known sites of linhays, which have now been lost forever. Comparison with the architectural survey commissioned by Devon County Council in 1982 reveals how the linhays have changed since that time. The monitoring of agricultural buildings on the Marsh would not only help to identify priority structures in need of attention, but would also help to observe the frequency of any new structures on the Marsh, such as those erected for equestrian purposes. Monitoring could also help in the development of a future strategy from a landscape perspective. Whilst the future may lead to the acceptance that it may not be possible to maintain all existing historic structures, it might be desirable to restrict the development of certain types of modern structure should they threaten to impact radically upon the character of the Marshes.

7.3 Education and Cultural Awareness

Recreational interest in the area of the Braunton Marshes has increased dramatically over the last fifty years. However, in recent years, visitor numbers appear to have remained relatively stable. Visitors can access views across the Marsh pastures from the Braith or Toll Road, and from the South West Coast Path, which runs along the embankments. The Marsh is currently included under the Heritage Coast designation, which supports the aim to enhance recreational opportunities, public appreciation and understanding on the proviso that such measures are sympathetic to environmental and cultural protection. Similarly, enhanced public understanding is a key aim of the North Devon Interpretation Strategy, and of the North Devon AONB which, it is

hoped, may incorporate the Marsh within its boundaries at some point in the future. The development of increased recreational interests or the encouragement of greater visitor numbers is considered to be counter to the environmental and agricultural interests of the Marsh. However, initiatives to support the environmental, historical and cultural awareness of the Braunton Marsh do offer scope for development. Heightened awareness has already been achieved, in part, through the publication of this study. However, three further actions have now been identified that offer a realistic opportunity to achieve a greater understanding of the Marsh.

Suggested action:

Initiatives with Local Educational Institutions.

Initiatives with local schools or colleges might involve practical fieldwork, which could perhaps be associated with the monitoring of environmental resources on the Marsh. Such fieldwork might be organised through the IDB, and conducted over a period of one or two days each summer. The Northern Devon Coast and Countryside Service has also advised that it may possibly be able to provide some guidance for simple monitoring techniques. Such fieldwork would cause very little disruption to the consenting landowners, and provide a basic, but ongoing source of information. Community involvement would also simultaneously promote the natural heritage of the area, and a better understanding of the intrinsic connection between Marsh wildlife and agriculture. Classroom-based or virtual fieldwork also offers further opportunities for raising local awareness of the area.

Inclusion within the Explore Braunton Project (subject to funding).

A funding bid for an innovative project aimed at increasing the awareness of North Devon's natural and cultural heritage has been submitted through the Northern Devon Coast and Countryside Service. Although this bid has not yet been granted, subject to funding, the Explore Braunton Project aims to develop a number of new initiatives, with a particular emphasis on utilising new technology to enhance access to information and archive materials, including a website. The Braunton Marsh represents an ideal area to include in such a project.

Information Leaflet Distributed at the Toll House.

It has been noted that many visitors to the area express a desire to know more about the area, and frequently enquire about the availability of an explanatory leaflet at the Toll House. A leaflet could be produced independently, through a small funding bid, or through other public awareness initiatives that may arise.

7.4 Consultation

Horse Island is an area of land adjacent to the Braunton Marsh which was reclaimed during a second phase of engineering work in the 1850s. Horse Island has been identified in several estuary management documents, including the Shoreline Management Plan, as a potential site for saltmarsh restoration through managed realignment. If Horse Island is allowed to return to the sea, the original Great Embankment, bordering the Toll Road, would once again become the main sea defence, which would have implications for the Marsh environment, its cultural heritage and its management. The realignment of Horse Island was not supported in the 1998 Shoreline Management Plan, which recommended that the stretch of coastline between Crow Point and Chivenor, should be "observed and monitored". At Horse Island, the responsibility for the notoriously expensive maintenance of the sea embankments falls to the landowner. In order to avoid the breaching of the embankment, as occurred previously in 1910, these costs will undoubtedly grow, particularly as a result of anticipated sea-level rise and the increase in storm frequency and intensity predicted with climate change. Consequently, the area faces ongoing controversy over its long-term future, either due to a catastrophic failure of the sea defence, or following a strategic review of the sea defences within the next few years. In view of the close association between Horse Island and Braunton Marsh, the Braunton IDB must be an essential component of all future decision-making processes regarding this stretch of coastline.

Similarly, any potential future development affecting other sites adjacent to the Marshes, such as renewed calls for a Braunton Bypass, should also involve comprehensive consultation with Marsh landowners to establish any potential impact on the Marsh.

Suggested action:

Government bodies must ensure that the Marsh landowners, the IDB and the Marsh Inspectors are included in the consultation process for all future issues which may potentially impact upon the Braunton Marshes.

Overview of Current and Future Marsh Management

As described above, the future of the Marsh will ultimately depend upon the wishes, and actions of the landowners, together with the support and initiatives of a variety of organisations at national, regional and local level. What is clear, however, is that Braunton Marsh represents a unique and special area, both in terms of wildlife and as a fundamental part of local history, which contributes to the cultural identity of North Devon. The Braunton Marsh is neither a time capsule, nor a nature reserve. It is a working agricultural environment. As with all living landscapes, the area is inevitably in a state of constant change. The Braunton Marsh has seen many changes through the last 200 years, moving from a natural saltmarsh to an environment dependant upon agriculture. Agriculture remains central to its future. Without intervention, such as measures to halt the decline of all the marsh linhays or economic incentives to help guarantee the continuation of traditional farming, the management of the Marshes will remain at the mercy of external pressures. Would the character of the Marsh be changed by the absence of linhays, and is the environmental interest of the area negated by a reduction in the diversity of species within the pastures? Surely the answers to both of these questions would be 'yes'. Therefore it seems prudent that the costs of ensuring that current resources are preserved for future generations do not fall entirely upon the farmers, whose primary concern is naturally to secure their livelihood. The costs of long-term environmental and cultural conservation, so beneficial to our society as a whole, should be a collective responsibility, and not a financial burden placed upon a few individuals. The absence of a central authority or coordinating body for the Braunton Marsh presents an obvious difficulty regarding whose responsibility it is to act. However, it does provide, simultaneously, the opportunity and the scope for a large range of individuals and organisations to play a key role in the future of the Marsh, should they choose to do so. The TTEF could act as an intermediary for any organisation or individual who would like to get involved. The location of the Braunton Marshes also falls within the UNESCO International Biosphere Reserve Buffer Zone, a designation with strong objectives toward sustainable development. The area, therefore, presents an ideal opportunity to demonstrate what can be achieved when people decide to be proactive and to work together in order to facilitate solutions incorporating economic, environmental and social interests.

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Appendix 1 - Glossary

AONB	Area of Outstanding Natural Beauty. A statutory designation whose purpose is to conserve and enhance the natural beauty of the area.	Managed retreat/realignment	The practice of returning areas of land, previously protected by sea defences, to a more natural, tidal environment in line with the demands of sea-level rise.
BAP	Biodiversity Action Plans. A series of national, regional and local action plans committed to the preservation of habitats and species in response to the 1992 Convention on Biological Diversity.	Penstock	An adjustable sluice used to control the flow of water into and out of the drainage system.
Braunton Marsh	Area of Common land (Braunton Parish) subject to tidal inundation prior to enclosure.	Pill	A large tidal creek or channel.
Braunton Marshes	Collective name for the numerous individual pastures created after first enclosure of the Braunton Marsh.	Poaching	The trampling and churning up of damp or wet soils by livestock.
CAP	Common Agricultural Policy. System of European agricultural subsidies.	Pot Wallowing	The annual tradition of re-banking the stones from the base of the pebble ridge at Westward Ho.
Defra	Department for Environment, Food and Rural Affairs.	SSSI	Site of Special Scientific Interest.
Dykes	A local term for drainage ditches, corrupted from the Dutch 'Dijks' (which actually refers to the embankments rather than to the water channels.)	Staff hook	A short-handled implement with curved blade, used for hedging.
Gut	Small tidal creek or channel.	Talet	The hay loft in a Linhay.
IUCN red list	A comprehensive inventory of threatened species compiled by the International Union for Conservation of Nature and Natural Resources.	Taxon	A distinct grouping of flora and fauna.
Linhay	An agricultural building which provided shelter for cattle.	UKMAB	United Kingdom Man and the Biosphere
		UNESCO	United Nations Educational, Scientific and Cultural Organisation.
		UNESCO International Biosphere Reserve	Sites recognized under the UNESCO Man and the Biosphere Programme, whose aim is to innovate and demonstrate approaches to conservation and sustainable development.

Appendix 2 - Rights of Common

The Braunton Marsh has long been associated with Braunton agriculture. A 'Lease and Release' dated 1703 describes the transfer of land rights for property including 'pasture for four bullocks, 2 horses and forty sheep in the Braunton Marsh' (NDRO¹). This ratio of livestock (i.e 2:1:20) is believed to represent a conventional way for the apportionment of grazing rights on Braunton common land (BM¹). 'A list of Commons in Braunton Marsh' (NDRO²) produced in 1794 also corresponds to this convention, and calculated the Braunton Marsh to contain 127 ½ commons, held by major landowners across an area of just over 1031 acres. Use of the formula calculates Braunton Marsh to have theoretically provided grazing for 255 Bullocks, 127 Horses and 5100 Sheep, a tall order even for just over 1000 acres. By this reckoning it might therefore be assumed that common rights can not have been fully exploited by all tenants at all times, or that the formula did not always hold true. Indeed, court documents produced in 1795 provide evidence to suggest rights of common in the area were subject to exchange (DRO¹), thus distorting the standard formula. Common rights became the basis upon which lands were allotted following reclamation of the Marsh, just 20 years later.

Appendix 3 - Pre-reclamation

Extracts from the diaries of Mr Philip Roger Webber Esq. of Buckland, describe a meeting on January 27th 1809, conducted at the Braunton Marsh¹. This is likely to have been one of the first of several meetings to discuss enclosure and embankment. Meetings were open to all those with an interest; both landowners and occupying farmers (BM³). Work progressed with the commissioning of the notable Civil Engineer James Green, a man responsible for many major engineering projects in Devon during his life-time. Under the direction of Mr Green, a survey of the area was conducted by John Pascoe, and a map produced which can still be seen today (DRO²). In September 1809, at a meeting at the Black Horse (a favoured meeting place for issues of the Marsh),

Mr Green reported that his plan for embanking the marsh from the tide could not be done for under £20,000 (BM³). The cost raised considerable concern, as stated in a letter from Lord Rolle written in response to the meeting (BM³).

On Monday August 27th 1810, almost a year on from the initial meeting at the Black Horse, a decisive meeting was called by Lord Rolle in which the majority of landowners and their tenants finally agreed to Mr Green's terms (BM³). Two separate plans were proposed, as indicated on the Green-Pascoe survey deposited with the Clerk of the Peace in Exeter in September 1810 (DRO²). The more elaborate proposal involved an embankment from Bench Hill (where the White House stands today) to the mouth of Braunton Pill. The scheme included a canal from Braunton Pill to Wrafton, around Velator Marsh and down to the location of lime kilns (now the Kiln Cottages close to today's Velator Quay). Several miles of new drains were to extend almost to Saunton Village, also cutting through parts of the Braunton Great Field. The second, alternative line of embankment is also drawn, however, approximately in the position of the current Great Bank. Sources suggest that the more grandiose plan was thwarted by the objection of the Bassett Estate (Parkinson, 1976), which was concerned about the enclosure of immature saltmarsh at Horsey - an exercise doomed to failure according to Vancouver (NDA¹).

On May 25th 1811, an 'Act for the Inclosing, Draining, and Embanking Lands in Braunton, in the County of Devon' was finally approved by Royal Assent, signalling that work was finally free to begin (BM²). In the Act, three Marsh Commissioners were appointed to oversee the enclosure and drainage work, and were paid £2.12 6d. The Act sets out, in great detail, all aspects of the duties, powers and methods by which the enclosure and allotment of land were to be conducted. It also included the method of the subsequent management of the land, which was to be undertaken by Marsh Inspectors once enclosure was complete (BM²) (see also Appendix 5).

Appendix 4 - Pre-reclamation

By 1813, significant progress with the construction of the embankment appears to have been made (NDRO³). However, it also appears that technical details of the scheme remained in a state of flux, and there was a sense of growing concern over cost. This sense of concern over cost is indicated in a communication to the Marsh Commissioners from 20 Braunton tenants and freehold farmers objecting to the erection of a lock into the interior of the marsh proposed by Mr Green, and other issues of contention (NDRO³). Increasing financial outlay is likely to have concerned both tenants and landlords, to whom the costs of the embankment, draining and enclosure were passed. Details from the Enclosure Act of 1811 help to piece together some of the financial arrangements for the reclamation. Marsh Commissioners were empowered to borrow sums up to £5 per acre for the inclosing, allotting and dividing of the Marsh, and £8 per acre for the expenses to embank and drain the Marsh (BM²). These sums were to be charged against the Marsh, with the Commissioners endowed with powers to the sell plots of the newly-enclosed marsh land from time to time, sufficient to recover the money (BM²).

Documents from the Incedon-Webber collection at North Devon Records Office show evidence of the landowners advancing money for the draining of the Braunton Meres; an area to the north of the Braunton Marsh, close to Swanpool. Landowners directly benefiting from the land drainage advanced the money, and charged their tenants annual interest, with a final payment upon completion of the project (NDRO³). This final payment was determined as a varying proportion of the improved annual value of the tenancy land upon completion of the drainage works, as inspected by two independent surveyors both before and after the drainage (NDRO³). The proportion of this increase in value was then multiplied according to the length of a tenant's lease (NDRO³).

Under an agreement dated Sept 10th 1814, a proposal by James Green for the drainage of the Braunton Mere was to be executed for the sum £785, including compensation for lands injured by the works and incidental expenses (NDRO⁷). Detailed plans of the drainage scheme are also included amongst the Incedon-Webber documents, specifying depths, widths and slope angles for the ditches to be cut (NDRO³). Less than a year later, and 6 months ahead of schedule, Edward Harris and John Mallett inspected and approved payment of James Green for his drainage of Braunton Meres conducted in a "good workmanlike manner", April 19th 1815 (NDRO⁹).

Overall, the impression gleaned from the fragmented information remaining from the time suggests an image of financial pressure, but also of an efficient and timely construction schedule. Though few indications of the financial arrangements for construction remain, details of the drainage of the Braunton Meres suggest the logic of breaking the overall project into sections, with the corresponding charges to benefit the landlords. In the absence of evidence to the contrary, it seems reasonable to suggest that this may have been the way that most, if not the whole of the construction costs, were raised.

Given the number of acres held by the Braunton Manors and other upcoming freeholders, total costs must have represented considerable sums of money even for the wealthy. Certainly, records indicate that after the completion of the works, in correspondence with the 1811 Act, three sales of land on the peripheries of the newly-reclaimed Marsh were conducted to recoup the borrowed money (MC¹). Details from the Marsh Award suggest that the first sale occurred as early as September 1813, with a second in August 1814 and a third in December of the same year. Cash at this time was presumably quite scarce for some of the landowners, who had advanced the money for the works, and who were now purchasing land prior to receiving the repayment of their loans. Perhaps for these reasons, maps of the newly-allotted lands show several lots of land bought in partnership (MC¹, MC³, OS¹). In addition to the expense of purchase, new landowners were also responsible for the construction of various fences and hedges, to be completed within

one year of occupation (OS²). Landowners were also responsible for the ongoing maintenance of certain lengths of drains adjacent to their lands (OS²). In 1815, allotments of land were awarded to those with common rights on the Marsh, to be held for a period in accordance with existing tenancy agreements (OS²). Newly-sold plots and allotments were recorded, along with their new owners and occupiers in the Marsh Inspectors' minutes (MI¹), with details of sales and plot allocation later set down and officiated in the Marsh Award of 1824 (MC⁴). Like the new owners of the sold Marsh lands, allotment holders were also responsible for the construction of boundary walls and for the maintenance of certain drains. Thus hundreds of tonnes of stone, horse-work and manual labour were committed, by both occupiers and owners, to construct the tens of miles of walls that still divide much of the Marsh today.

Appendix 5 - Marsh Inspectors

One month after the completion of the works set out under the 1811 Act, the Commissioners were required to call a meeting for the nomination of Marsh Inspectors from amongst the owners and occupiers. Upon their appointment by a Justice of the Peace, the one or more Inspectors were essentially responsible for all future marsh management, holding all property in Trust on behalf of the owners and occupiers. Election of the Inspector(s) was to be held each year on Marsh 25th, also known as Lady Day. Although it does not appear to be stipulated anywhere that three Inspectors be appointed, it appears from the records that this protocol was adopted in line with the previous number of Marsh Commissioners, and the practice of appointing three Inspectors has continued to the present day. Evidence of the undertaking of Marsh Inspector duties, along with completion of listings for all new occupiers and owners on the Marsh toward the end of 1815, therefore supports the idea that all major construction works had been completed by this time.

On December 21st 1815, the first Marsh Rates were set at sixpence in the pound (MI¹), on the basis of the value of the occupied land. As stipulated in the Act, rates were to be collected to help cover the salary and expenses of the upkeep the banks, cuts, drains, bridges and other works (BM²). In 1816, the total for the first rate amounted to £13.10.1¾. Under the Act, the Inspectors were entitled to collect as many rates per year as they saw fit to cover expenses, and five rates were collected in the first year, totalling £67.10.8¾, (MI¹), with invoices for masons, blacksmiths, carpenters, boats of stones, timber and horse-work perhaps indicating that elements of the construction work had yet to be completely finished (MI¹).

The construction and maintenance work undertaken, however, was not solely paid for by the rates of the owners and occupiers. Income also came from the sale of grass from the banks and their over-winter rental, a practice that continues to this day. 'Gate money' began to be charged for the use of the Toll Road for access to the ferry, fishing grounds or burrows (MI¹). Fines and penalties were also issued over matters such as the poundage of escaped stock, trespass, and injury to the banks by livestock, horses and carts (MI¹). Typical outgoing involved small payments to farmers for the cleaning of the drains and canals, the killing of rats and moles to prevent the undermining of the embankments, payment for equipment such as shovels and picks, lime for the banks and even beer for the workers (MI¹). Along with the organisation of all these matters, Inspectors were also responsible under the Act for enforcing matters of good husbandry of the allotted marsh lands, including the upkeep of fences and the stipulation of precise quantities of lime or manure that must be sown should an allotment be ploughed for tillage (BM²).

Appendix 6 - Braunton New Quay and the Enclosure of Horsey Island

After enclosure, there appears to have been a longstanding intent to develop a new quay along Braunton Pill. In 1840, three plots of land forming the Sharper Marshes were bought by the Inspectors, on behalf of the marsh owners from Thomas Scott and Robert Dyer, (MI⁶). In 1844, a surveyor was employed, on behalf of the proprietors, to report upon the 'probable expense of erecting a quay near the Inspectors House' (MI¹). A committee was appointed to liaise with the neighbouring landowners, Joseph Davie Bassett, Esq. and Arthur Bassett, Esq regarding the proposed plans for a quay. However, the ensuing meeting, which occurred sometime in May 1844 was unsuccessful, provoking a resolution that no further actions should be taken by the Inspectors (MI¹).

Nine years later, in 1853, following the sales of the Bassett Estate to Mr William Williams, Esq. in 1852, plans were proposed to straighten Braunton Pill and reclaim the remaining fringes of land left unenclosed after the first embankment. A meeting of Barnstaple Town Council in January 1853 is reported to have supported Mr Williams' proposals, on the provision that navigation was safeguarded (NDJ¹). Mr Williams was instructed that the fish weirs posing a hazard (located) at the mouth of the pill, should be removed and their owners compensated, at an estimated cost of £300-£400 (NDJ¹). It was also agreed that a survey of the channel be commissioned (NDJ¹).

A further meeting, this time with the owners of Braunton Marsh and their representatives – the Marsh Inspectors–was called at the Fortescue Arms in Barnstaple, on the 23rd of September, at 12 noon (MI¹). At the meeting, Mr Williams explained and submitted a plan (MI²) of the proposed embankment and alteration of the channel at Braunton Pill (also known as the 'new cut', which would shorten the navigable channel by half a mile (Whitley, 1861). The proprietors unanimously consented to the modifications to be paid for by the Williams Estate, upon the condition that Mr Williams would compensate the landowners for any damage caused by the cutting of the banks at Sharper (MI¹), a plot of land positioned on the site of a pre-reclamation sandbank of the same name (DRO¹). Mr Williams also appears to have purchased the pasture land of the Sharper Marshes from the Inspectors at this time (Whitley, 1861). The Inspectors also requested that Mr Williams extended the proposed embankment to cover an area of about 10 acres close to the Ferry House at Bench Hill which, until this point, was on the seaward side of the sea defences. In return, around 7 acres of land, forming the existing embankment of Sharper Marsh, would also be given over to Mr Williams. The details of these arrangements are contained within indentures and conveyances of the Marsh Inspectors' records, and include an agreement in 1855 that work would be completed within three years (MI⁶).

A major report by the engineer Nicholas Whitley reveals his initial misgiving about the hazardous undertaking of reclaiming 25 acres of barren sand (Horsey Island) (Whitley, 1861). Nonetheless, work began, and an initial call for tenders was made in the local paper, March 16th 1854 (NDJ²). Work was split into 2 contracts, both requiring the construction of large sections of embankment, one of which also included the cutting of the new channel. Further calls for subcontractors and for 200 navvies, was made in October 1854, and also for a haulier of 60,000 yards of stone from Braunton Down and other quarries (NDJ³). The financial arrangements for all concerned, however, do not appear to have always run completely smoothly. A newspaper report in August 1855 describes the case of Gammon versus Morgan, in which the plaintiff issued a claim for wages owed by a subcontractor. The subcontractor was apparently unable to pay following the bankruptcy of the principal contractor some months previously (NDJ⁴). Work also appears to have been disrupted by vandalism of planking and of construction materials on the Heanton embankment during 1855, with a reward of £5 being offered for information leading to the detection of the offender(s) (NDJ⁵). This vandalism may relate to an issue described in a later report by engineer Nicholas Whitley, stating that a 'considerable amount of local prejudice had to be overcome' (Whitley, 1861).

Whitley's report indicates that the embankment and enclosure of around 200 acres of land at Chivenor were completed in 1856 (Whitley, 1861). This was followed by completion of the works at Wrafton and finally by the enclosure of Horsey Island in 1857 (Whitley, 1861). The embankments were constructed from material dug from the inner ditch. The seaward face of the earthworks was coated with 3ft. of clay into which pitch paving was driven to a depth of between 9 to 12 inches, depending on the exposure to wave action (Whitley, 1861). Having found the local egg-shaped estuary boulders to be inferior, stones from Braunton Quarry were the preferred materials for the pitch paving of the embankments, with a geological structure causing the stone to fracture into wedge-shaped stones, which were easily driven into the clay (Whitley, 1861).

Some parts of the embankment were also being built upon pure sand, making construction work very difficult. Where the banks were built on pure sand, an extra 3ft. of clay was sunk at the foot of the bank, to prevent salt water penetrating to the other side (Whitley, 1861). Though the upper part of the straightened channel or 'new cut' was situated upon firm clay loam, further south, the embankment was positioned upon exactly this type of pure sand sediment. Described as 'perfect quicksand', pumps were required night and day to remove water welling up from a number of springs (Whitley, 1861). The channel, therefore, had to be lined with clay and the base filled with gravel to prevent scour (Whitley, 1861). Similarly, the 0.75 miles length of the Horsey embankment was built 'over quicksand where no solid rock could be touched with a 20ft. boring rod' (Whitley, 1861). Simultaneously building the Horsey Island embankments from both the eastern and western ends, the difficulties of construction on this substrate were compounded by the scouring action of the tides. Tidal scour caused considerable difficulty for progression and the completion of final stage of embankment that would permanently shut out the sea (Whitley, 1861). Finally, however, small furze faggots weighted with stones, were positioned on the construction site and existing ends of the embankment at the site of the "shut out" (Whitley, 1861). At 3 a.m. on Monday, June 15th 1857, 320 men and 140 carts (operating three abreast), together with the use of the existing trainway and barrow roads, began to infill the embankment gap, and the enclosure of Horsey Island was complete (Whitley, 1861, NDJ⁶). Despite the difficulties, the works were completed well within the three-year allowance (MI⁷), with the embankment costing £13,394, around £300 under the estimate (Whitley, 1861). As with the initial reclamation, however, further expense continued long after the initial construction works were complete.

Demands of the Inspectors

In 1857, after the completion of the enclosure, a further agreement between the Inspectors and Mr Williams was made to determine the several maintenance responsibilities and the entitlements of the Williams' Estate (MI⁷). Provision of freshwater south east of Velator, was to be ensured by the Williams' Estate, with liberty being given to alter and improve the flow and controls of the water at or near Velator Bridge as appropriate (MI⁷). It was also dictated that it was the responsibility of the Williams' Estate to ensure the provision of 'proper and sufficient' embankment so as to prevent the breaching of the banks on high tides into the canal and road by Sharper, in order to maintain the quality of its water for cattle (MI⁷).

With regard to the provision of water to Horsey Island, it was determined that a control should be built to raise the water level, and a system of pipe work constructed to divert any excess water through the original embankment and under the original river bed (MI⁷). Should the water fail to flow, water for livestock could be taken from the drains next to the Toll House. Mr Williams, his heirs and his tenants were granted freedom from tolls, and permitted to create a road across the Great Bank at a position now known as the 'Crossing Banks'. Fortuitously, a shingle bank on the now enclosed Horsey Island provided a convenient supply of a

material appropriate for the job (Whitley, 1861). Maintenance of both the road and the bank in this area was deemed to be the responsibility of the Estate, and an annual rent of £2 was paid for the land, again a practice that continues to this day. Upon non-payment of rent or the failure to perform maintenance within a period of 28 days, the Marsh Inspectors were thereby entitled to recover the costs from within the lands of Horsey Island and Broadsands (MI⁷).

It was also determined that a boundary wall of 4 ½ ft. in height should be built 40 ft. from the foot of the Great Bank dividing Horsey Island from the land of the Braunton Marsh (MI⁷). This wall had to be completed within one year (MI⁷). The south-western section of the Island, which remained the possession of the Marsh Inspectors, was also to be divided, by means of the wall. Permission was granted that material might be taken from this area (subject to a compensation payment) for any repair to the banks (MI⁷). However, upon a later agreement in 1858, this land was exchanged for the western portion of the Sharper Marsh, now known as Little Sharper (MI⁸). Within this agreement, it was permitted that sufficient stones to build the walls might be taken from the Great Bank, with any surplus stones purchased for the sum of £20, provided that sufficient stone was left in order that the Marsh Inspectors could build two fences across the embankments and road as they saw fit (MI⁷).

Additional Works and Final Costs

In addition to the works required by the Inspectors, several other outlays were also necessary after the enclosure. A further five miles of stone wall were built to divide the enclosed land into sections of approximately 10 acres each, and these were subdivided by a 5-strand wire fence joined by oak posts, with larch top-bars (Whitley, 1861). Several linways were also built at a cost of £45 each. In addition, field drainage was also necessary, as the reclaimed land was 'much broken up by pools and small channels', and cost in the region of £4 per acre, over the whole of the 400 acres reclaimed (Whitley, 1861). The sward (surface layer of soil and vegetation) was disturbed as little as possible in this process, on account of the variable depth of this fertile surface layer across the marsh. However, where barren sand had been reclaimed, between 200-400 loads per acres of alluvium were transported, in order to render the land productive (Whitley, 1861). Guano was also sown into the old sward with no effect, but where it was sown onto the sand coated with soil, it produced very vigorous grass growth (Whitley, 1861). Special marsh-land grass seed was purchased from London at a cost of 30s. per acre, but this seed was found to fare no better than ordinary grass seed at a cost of 10s. per acre, providing a considerable saving (Whitley, 1861). In total, additional costs amounted to just over £4000. The overall total cost was estimated by Whitley to be in the region of £18,000 (Whitley, 1861).

Subsequent to these reclamation works a new quay was constructed along the newly straightened and deeper channel. This development is believed to have been completed in 1870 (NDJ⁹). Completion of the new quay allowed for considerable development and diversification of trade in the Braunton area. This is quite possibly one of the prime economic benefits of the reclamation works, considering the difficulty of the scheme and a relatively meagre return on the agricultural land improvement. The quay was now able to cope with much larger vessels, trading in lime, coal and also transporting locally produced crops. Similarly, in the true spirit of sustainability and entrepreneurialism, the area of the original channel was now employed for the purposes of fishing, shooting, and reed production. Even today, the shooting rights across this area continue to provide a worthwhile income for the landowner. Unfortunately for the Williams' Estate, however, evidence suggests that this second phase of reclamation had not run as smoothly in the long term as the works completed in 1815. By the early 1870s, detailed plans, and an extract from a report by the engineer Sir John Coode, indicate that it had become necessary to protect the Western end of the Horsey embankment, close to the site of the final shut out of the sea. This was achieved by means of a 60ft stone groyne, with a recommendation for a second groyne at the eastern end of the embankment (NDRO^{13, 15}). A further letter, dated 1875, also indicates a significant 'running sand' problem at the site of the New Cut, which was causing the stone pitching of the banks to subside (NDRO¹⁴). Again, the engineer Sir John Coode was enlisted to help to rectify the problem,

and he suggested either the use of faggotting, or reducing the angle of the embankment, in order to resemble parts of the bank further south west. Despite stating the use of faggots was the ideal solution, and in the absence of suitable materials for faggots in the neighbourhood, Sir John Coode recommended the more pragmatic option of flattening the angle, thus allowing the reuse of the existing stones for pitching, (NDRO^{14, 15}).

Appendix 7 - A Brief Outline of Repair to the Horsey Embankments following the 1910 Storm

A dam was constructed to the seaward side of the deepest breach, using concrete foundations, wood pilings and bags of concrete filling. The objective was to impound water within the area of Horsey Island itself to a level constant with that of the neap tide, thus reducing the amount of tidal scour which constantly exacerbated the size of breaches. The Horsey sluice was therefore shut on each ebb tide, and a hand-worked penstock erected on the inlet side of the sluice to help control the water level (NDRO¹⁸). After the area was eventually excluded from the sea, and following subsequent scour, the wing walls on either side of the sluice were pulled down and replaced, and the banks to the side protected with rough stone pitching.

To repair the breaches several techniques were used. A 75 ft. barge was sunk into position at the site of the first breach, but unfortunately was found to produce a large amount of scour and the breach subsequently eroded further before stone, clay and foreshore material could be packed around it. Three further barges, each around 38ft in length, were sunk into breach three, the second largest breach. The sand dredger 'Nancy' was used to pump sand from the foreshore into the breaches. Nancy was also used to remove the sand deposits now spread across the surface of Horsey Island, which in total amounted to 36,890 cubic yards. The sand was used to fill a hole behind breach three, and also for the landscaping of two decoy duck ponds positioned on the inward side of the embankment adjacent to breaches one and three. Wooden gantries above the breaches and a railway along the bank were also constructed to assist with filling the breaches. The existing groynes were repaired and new ones built to help increase the eroded level of the foreshore. Stone pitching along the embankment was removed and replaced, and leaks in the newly repaired embankment secured by filling a trench on the outer toes of the embankment with puddle clay.

Despite carefully considered plans, and measures to minimise further damage and erosion to the site of repairs, details from the final report reveal that the repair work took considerably longer, was far more difficult and costly than originally anticipated, and seemed plagued with damage from further storms that continually set back the work. In fact, over two months later than the seven months originally estimated for completion of the work, and with no end in sight, the contractor W.G. Gradwell ended their contract to complete their repairs (NDRO¹⁸). Following this, several other contractors approached also refused to consider the work, and it was decided by the Trustees of the Williams' Estate that the repairs should be completed under administration (NDRO¹⁸).

According to the notes made by local historian Commander Gammon in the latter quarter of the Twentieth Century, the breaches of the Horsey Embankment significantly depleted the Williams' Estate fortune, and led to the sale of 3 Estate farms, including Broadgate around 1812 (BM¹). Unfortunately, the primary sources of this material have not been located, however it is understood that Mr Gammon had access to many private documents over the many years of his research into Braunton's history. A further enigma is the location of an original series of photographs, made at the time of repairs, which are believed to have once hung in the offices of Pitts Tucker Solicitors. Only one set of poor quality images remains (BM⁴), but shows dramatic photographs of the several washouts, the outflow of impounded water through the breach, gantry, sand dredger and railway constructed along the embankment to supply repair materials.

References/List of Archive Resources

Please note that a large amount of archive material has been electronically scanned, photographed, or photocopied during the process of this study. Due to space restrictions, not all items have been referenced or referred to within this report. However, the compilation of this material is available through the North Devon Records Office. For audio material of interviews with Marsh landowners, please contact the Taw Torridge Estuary Forum.

Primary Sources

Braunton Museum (BM)

- BM¹ Notes of Commander Gammon, various locations, Braunton Museum
- BM² Act for Inclosing, Draining and Embanking Lands in the County of Devon, 1811 (Box 25)
- BM³ Extracts from the Diaries of Philip Roger Webber, Braunton Museum
- BM⁴ Photocopies of photographs made at time of Horsey repairs (Box 25)
- BM⁵ An agreement between the Wraughton Commoners, George Newcombe and the tenants of Braunton Marsh Sea Banks, 1844 (Box 16)
- BM⁶ County Court of Devonshire, Judgement by his Honour Judge W. B. Lindley, 1932 (Box 16)

Devon Records Office (DRO)

- DRO¹ Court papers from the Courtenay Estate regarding a boundary dispute at Vellator Marsh, Braunton, 1795; L1508/EL/Court/67
- DRO² Green-Pascoe Survey, 1809; Deposited Plan 17
- DRO³ Record of Benjamin Baker 1797; 56/11/1/59
- DRO⁴ Letters from J L Snow, 1877; Anstey and Thompson of Exeter High Bray Estate, Braunton 1926 B/A/E/8/2

Marsh Inspectors documents (MI)

(Courtesy of the Marsh Inspectors; Rowland Dibble, John Hartnoll, Owen Slade)

- MI¹ Marsh Inspectors Minute Book 1
- MI² Marsh Inspectors Minute Book 2
- MI³ Marsh Award Map 1824
- MI⁴ Marsh Award 1824
- MI⁵ William Williams plan for the embankment and enclosure of Horsey Island 1853
- MI⁶ Indentures and conveyances between the Inspectors and William Williams regarding the Horsey Embankment 1855
- MI⁷ An Indenture between the Inspectors and William Williams regarding duties of watercourse maintenance, boundary construction and access rights 1857
- MI⁸ An Agreement with the Marsh Inspectors 1858
- MI⁹ Invoice from Fred Smith for weed cutting, 1950
- MI¹⁰ Letter from Dorothy Squire to the Marsh Inspectors, 1970
- MI¹¹ Schedule of condition of the Ferry House, Oliver & Sons, 1942
- MI¹² Marsh Inspector accounts 1946-1948
- MI¹³ Insurance documents for the Marsh Inspectors properties, 1923
- MI¹⁴ Two letters from Mr Slee regarding ownership of lands between the canal and public highway at Velator, 1933
- MI¹⁵ Letter from Pitts tucker Solicitors regarding lands recently sold to Mr Isaac and Sons, 1930
- MI¹⁶ Letter from Barnstaple Rural District Council to the Marsh Inspectors regarding a proposed sewage works to discharge into the Marsh drainage system, 1937

North Devon Atheneum (NDA)

- NDA¹ Vancouver, C., 1808; A General View of the Agriculture of the County of Devon, with observations on the means of its improvement. Report for the Board of Agriculture. Reprint 1969, David and Charles

North Devon Records Office (NDRO)

- NDRO¹ Lease and Release, 1703; 2239B add8/121
- NDRO² A list of Commons on Braunton Marsh, 1794; Incledon-Webber Collection, 3704M/SS/11
- NDRO³ Statement from several farmers to the Marsh Commissioners to object to a lock proposed by Mr Green, 1814; Incledon-Webber Collection, 3704M/SS 14
- NDRO⁴ Letter by Edward Harris, 1814; Incledon-Webber Collection, 3704M/SS 6
- NDRO⁵ An agreement signed by tenants and Landlords for the improvement of the Braunton Mezes. Incledon-Webber Collection, 3704M/SS 4a

- NDRO⁶ Letter from Richard Dyer to Lord Rolle regarding interest payments fro land held under Baliol College, 1814; Incledon-Webber Collection, 3704M/SS 5
- NDRO⁷ An agreement made with James Green and landowners, for the drainage of the Braunton Meres, 1814; Incledon-Webber Collection, 3704M/SS 11
- NDRO⁸ Specification of the proposed manner of the draining of the Braunton Meres, 1814; Incledon-Webber Collection, 3704M/SS/ 12
- NDRO⁹ Certification of inspection for work done in Braunton Meres, 1815; Incledon-Webber Collection, 3704M/SS 10
- NDRO¹⁰ Campbell Watercolours, B278/1
- NDRO¹¹ Sale particulars, 1848; Incledon-Webber Collection, 3704M/SS
- NDRO¹² Excerpt from notebook regarding St. Annes Chapel, no date; Incledon-Webber Collection, 3704M/SS
- NDRO¹³ Extract from the Report of Sir John Coode, 1875; B170/39
- NDRO¹⁴ Letter to Reginald Glanville Esq (Williams Estate, Truro) from Sir John Coode, 1875; B170/39
- NDRO¹⁵ Frank T Hussey (Surveyor), 1875; Cross-sections of the New Cut and proposed groyne. The Manor Office, Wrafton, 1875; B170/39
- NDRO¹⁶ Contract for the works of repair to Horsey Embankment, River Taw, Devon, 1811; B170 add/128-131
- NDRO¹⁷ W. J. Douglas, 1813; Financial Statement for the works of repair to Horsey Embankment, River Taw, Devon. B170 add/123-131
- NDRO¹⁸ W. J. Douglas, 1813; Précis of the disaster and repairs to Horsey Embankment, River Taw, Devon. B170 add/123-131
- NDRO¹⁹ W. J. Douglas, 1811; Plans and longitudinal sections of the breeches to the Horsey Embankment. B170 add/123-131

North Devon Journal Herald

(Archive held at North Devon Records Office)

- NDJH¹ Article, North Devon Journal Herald issue; 21.01.1853
- NDJH² Advertisement, North Devon Journal Herald issue; 16.03.1854
- NDJH³ Advertisement, North Devon Journal Herald issue; 19.10.1854
- NDJH⁴ Court proceedings, North Devon Journal Herald issue; 09.08.1855
- NDJH⁵ Offer of reward, North Devon Journal Herald issue; 04.10.1855
- NDJH⁶ Article, North Devon Journal Herald issue; 18.06.1857
- NDJH⁷ Article, North Devon Journal Herald issue; 22.12.1910
- NDJH⁸ Article, North Devon Journal Herald issue; 11.11.1937
- NDJH⁹ Article, North Devon Journal Herald issue; 28.08.1932
- NDJH¹⁰ Article, North Devon Journal Herald issue; 12.01.1933

Miscellaneous

- OS¹ Copy of the Map or Plan of Braunton Marsh, Vellator Marsh, Part of South Burrow, in the Parish of Braunton in the County of Devon as allotted and divided by the Commissioners under the Act of Enclosure and of the Canals, Bridges, Watercourse, and other works thereon. John Pascoe Surveyor, 1815; Courtesy of Owen Slade, Heddon Mill Farm, Braunton
- WMN¹ Article, Western Morning News; 09. 12. 1960; Strange and sombre attraction of Braunton Marsh, by A. J. Butcher

Secondary Sources

- Edmonds, E. A., 1972; The Pleistocene history of the Barnstaple area. Inst. Geol. Sci., Rep. 72/2
- Parkinson, M. A., 1976; A tentative historical ecology of parts of the Taw estuary – Braunton Marsh. Rep. Trans. Devon. Assoc. Advmt Sci 108; 37-60
- Whitley, N., 1861; On the embanking and reclamation of the marshlands of the manor of Heanton Punchardon, North Devon. Journal of Bath and West of England Society. 9; 283-295

Braunton Marsh Species List

Plants

List based on:

- Knight, L, 1997; Braunton Marshes Conservation Survey 1996.
- Environment Agency, Devon Area Internal Report.

- Survey of flowering plants at Horsey Island conducted on by R Hodgson on behalf of the Devonshire Association, Sept 2004

- Personal communications; Maranda Coleman-Cooke, Mary Breeds.

* = Horsey Island only

Agrimony	<i>Agrimonia eupatoria</i>
Alga	<i>Enteromorpha (sp. indet)</i>
Alga (blanket weed)	<i>Cladophora (sp. indet)</i>
Amphibious bistort	<i>Polygonum amphibium</i>
Annual meadow-grass	<i>Poa annua</i>
Annual sea-blite*	<i>Suaeda maritima</i>
Autumn lady's-tresses	<i>Spiranthes spiralis</i>
Autumnal hawkbit	<i>Leontodon autumnalis</i>
Barren brome	<i>Anisantha sterilis</i>
Betony	<i>Betonica officinalis</i>
Bittersweet / Woody nightshade	<i>Solanum dulcamara</i>
Black medick	<i>Medicago lupulina</i>
Black nightshade	<i>Solanum nigrum</i>
Blackthorn	<i>Prunus spinosa</i>
Bloody crane's bill	<i>Geranium sanguineum</i>
Blue-fruited water-starwort	<i>Callitriche obtusangula</i>
Bramble / Blackberry	<i>Rubus fruticosus agg.</i>
Branched bur-reed	<i>Sparganium erectum</i>
Bristly oxtongue	<i>Picris echioides</i>
Broad-leaved dock	<i>Rumex obtusifolius</i>
Broad-leaved everlasting-pea*	<i>Lathyrus latifolius</i>
Broad-leaved pondweed	<i>Potamogeton natans</i>
Broad-leaved willowherb	<i>Epilobium montanum</i>
Brooklime	<i>Veronica beccabunga</i>
Brookweed	<i>Samolus valerandi</i>
Buck's-horn plantain	<i>Plantago coronopus</i>
Bulbous buttercup	<i>Ranunculus bulbosus</i>
Bulbous rush	<i>Juncus bulbosus</i>
Canadian pondweed	<i>Elodea canadensis</i>
Cat's-ear / Common catsear	<i>Hypochaeris radicata</i>
Celery-leaved buttercup	<i>Ranunculus sceleratus</i>
Cleavers	<i>Galium aparine</i>
Cock's-foot	<i>Dactylis glomerata</i>
Common bent	<i>Agrostis capillaris</i>
Common bird's-foot-trefoil	<i>Lotus corniculatus</i>
Common centaur	<i>Centaureum erythraea</i>
Common comfrey	<i>Symphytum officinale</i>
Common cord-grass	<i>Spartina anglica</i>
Common couch	<i>Elytrigia repens</i>
Common duckweed	<i>Lemna minor</i>
Common field-speedwell /	<i>Veronica persica</i>
Buxbaum's speedwell	<i>Pulicaria dysenterica</i>
Common fleabane	<i>Salicornia europaea</i>
Common glasswort*	
Common knapweed / Black	<i>Centaurea nigra</i>
knapweed / Hardhead	<i>Dryopteris filix-mas</i>
Common male fern	<i>Centaureum fontanum</i>
Common mouse-ear	<i>Urtica dioica</i>
Common nettle / Stinging nettle	<i>Polypodium vulgare</i>
Common polypody	<i>Senecio jacobaea</i>
Common ragwort	<i>Phytolacca australis</i>
Common reed	<i>Ononis repens</i>
Common restharrow / Rest-harrow	<i>Eleocharis palustris</i>
Common spike-rush	<i>Erodium cicutarium agg.</i>
Common stork's bill	<i>Callitriche stagnalis</i>
Common water Starwort	<i>Spergula arvensis</i>
Corn spurry	<i>Anthriscus sylvestris</i>
Cow parsley	<i>Agrostis stolonifera</i>
Creeping bent / Fiorin	<i>Ranunculus repens</i>
Creeping buttercup	<i>Potentilla reptans</i>
Creeping cinquefoil	<i>Cirsium arvense</i>
Creeping thistle	<i>Cynosurus cristatus</i>
Crested dog's tail	<i>Cardamine (sp. indet)</i>
Crucifer	
Cuckooflower / Lady's smock/	<i>Cardamine pratensis</i>
Milk-maids	<i>Geranium dissectum</i>
Cut-leaved crane's-bill	<i>Bellis perennis</i>
Daisy	<i>Taraxacum agg.</i>
Dandelion	<i>Carex distans</i>
Distant sedge	<i>Geranium molle</i>
Dove's-foot crane's-bill	<i>Cirsium acaulon</i>
Dwarf thistle	<i>Sambucus nigra</i>
Elder	<i>Polygonum arenastrum</i>
Equal-leaved knotgrass	<i>Carex otrubae</i>
False fox-sedge	<i>Arrhenatherum elatius</i>
False oat-grass	<i>Brachypodium sylvaticum</i>
False-brome / Wood false-brome	<i>Chenopodium album</i>
Fat-hen	<i>Galium uliginosum</i>
Fen bedstraw	<i>Potamogeton pectinatus</i>
Fennel pondweed	<i>Equisetum arvense</i>
Field horsetail / Common horsetail	

Field rose	<i>Rosa arvensis</i>
Field woundwort	<i>Stachys arvensis</i>
Floating sweet-grass / Flote-grass	<i>Glyceria fluitans</i>
Fool's water-cress	<i>Apium nodiflorum</i>
Foxglove	<i>Digitalis purpurea</i>
Gipsywort	<i>Lycopus europaeus</i>
Glasswort*	<i>Salicornia agg.</i>
Goat's-beard	<i>Tragopogon pratensis subsp. minor</i>
	<i>Ulex europaeus</i>
Gorse/furze	<i>Epilobium hirsutum</i>
Great willowherb	<i>Lotus pedunculatus</i>
Greater Bird's-foot-trefoil	<i>Plantago major</i>
Greater plantain / Rats-tail plantain	<i>Carex riparia</i>
Greater pond sedge	<i>Typha latifolia</i>
Greater reedmace	<i>Spergularia media</i>
Greater sea-spurrey*	
Grey club-rush / Greyish bulrush /	<i>Schoenoplectus tabernaemontani</i>
Glaucous club-rush	<i>Salix cinerea</i>
Grey willow	<i>Aegopodium podagraria</i>
Ground elder	<i>Juncus inflexus</i>
Hard rush	<i>Phyllitis scolopendrium</i>
Hart's-tongue / Hartstongue Fern	<i>Crataegus monogyna</i>
Hawthorn	<i>Corylus avellana</i>
Hazel	<i>Calyptegia sepium</i>
Hedge bindweed	<i>Sisymbrium officinale</i>
Hedge mustard	<i>Oenanthe crocata</i>
Hemlock water-dropwort	<i>Eupatorium cannabinum</i>
Hemp-agrimony	<i>Senecio erucifolius</i>
Hoary ragwort	
Hoary willowherb / Small-flowered	<i>Epilobium parviflorum</i>
willowherb	<i>Heracleum sphandilium</i>
Hogweed	<i>Zanichellia palustris</i>
Homed pondweed	<i>Lonicera periclymenum</i>
Honeysuckle	<i>Hedera helix</i>
Ivy	<i>Lemna trisulca</i>
Ivy-leaved duckweed	<i>Juncus articularis</i>
Jointed rush	<i>Polygonum aviculare</i>
Knot-grass	<i>Torilis nodosa</i>
Knotted hedge-parsley	<i>Athyrium filix-femina</i>
Lady fern	<i>Galium verum</i>
Lady's bedstraw	<i>Lemna minuta</i>
Least duckweed	<i>Arctium minus</i>
Lesser burdock / Burdock	<i>Leontodon saxatilis</i>
Lesser hawkbit	<i>Potamogeton pusillus</i>
Lesser pondweed	<i>Stellaria graminea</i>
Lesser stitchwort	
Lesser swine-cress / Slender	<i>Coronopus didymus</i>
wart-cress / Lesser swine's-cress	<i>Trifolium dubium</i>
Lesser Trefoil / Lesser Yellow Trefoil	<i>Berula erecta</i>
Lesser water parsnip	<i>Carex extensa</i>
Long-bracted sedge	
Lords and ladies / Cuckoo Pint /	<i>Arum maculatum</i>
Wild Arum	<i>Triglochin palustre</i>
Marsh arrowgrass	<i>Galium palustre subsp. palustre</i>
Marsh bedstraw	<i>Gnaphalium uliginosum</i>
Marsh cudweed / Wayside cudweed	<i>Alopecurus geniculatus</i>
Marsh foxtail	<i>Equisetum palustre</i>
Marsh horsetail	<i>Hydrocotyle vulgaris</i>
Marsh Pennywort / Whiterot	<i>Veronica scutellata</i>
Marsh speedwell	<i>Cirsium palustre</i>
Marsh thistle	<i>Stachys palustris</i>
Marsh woundwort	<i>Hordeum secalinum</i>
Meadow barley	<i>Ranunculus acris</i>
Meadow buttercup	<i>Lathyrus pratensis</i>
Meadow vetchling	<i>Filipendula ulmaria</i>
Meadow-sweet	<i>Amblystegium riparium</i>
Moss	<i>Campyllum polygamum</i>
Moss	<i>Drepanocladus aduncus</i>
Moss	<i>Fissidens bryoides</i>
Moss	<i>Fissidens taxifolius</i>
Moss	<i>Plagiommium (sp. indet)</i>
Moss	<i>Pohlia (sp. indet)</i>
Moss	<i>Rhytiadelphus squarrosus</i>
Moss	<i>Artemisia vulgaris</i>
Mugwort	<i>Carduus nutans</i>
Musk thistle	<i>Vicia sativa subsp. nigra</i>
Narrow-leaved vetch	<i>Umbilicus rupestris</i>
Navelwort / Wall pennwort	<i>Bidens cernua</i>
Nodding bur-marigold	<i>Elodea nuttallii</i>
Nuttall's pondweed	<i>Linum bienne</i>
Pale flax	<i>Myriophyllum aquaticum</i>
Parrot's tater	<i>Oenanthe lachenalii</i>
Parsley water-dropwort	
Perennial rye-grass / Common	<i>Lolium perenne</i>
rye-grass	
Perennial sow-thistle / corn	<i>Sonchus arvensis</i>
sow-thistle	
Perforate St. John's-wort /	
Common St. John's wort	<i>Hypericum perforatum</i>
Pineapple weed	<i>Matricaria discoides</i>
Pink water speedwell	<i>Veronica catenata</i>
Prickly sow-thistle	<i>Sonchus asper</i>

Procumbent pearlwort	<i>Sagina procumbens</i>
Purple-loosestrife	<i>Lythrum salicaria</i>
Ragged robin	<i>Lycmis flos-cuculi</i>
Red bartisia	<i>Odonites vernus</i>
Red campion	<i>Silene dioica</i>
Red clover	<i>Trifolium pratense</i>
Red fescue	<i>Festuca rubra agg.</i>
Red valerian	<i>Centanthus ruber</i>
Redshank Redleg/Persicaria	<i>Persicaria maculosa</i>
Reed grass	<i>Phalaris arundinacea</i>
Reflexed Saltmarsh-grass*	<i>Puccinellia distans</i>
Ribbed melilot	<i>Melilotus officinalis</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Ringed hornwort	<i>Ceratophyllum demersum</i>
Rock samphire*	<i>Cribnum maritimum</i>
Rock sea-lavender*	<i>Linonium binervosum agg.</i>
	<i>Chaerophyllum temulum</i>
Rough chervil	<i>Juncus gerardii</i>
Saltmarsh rush	<i>Anagallis arvensis</i>
Scarlet pimpernel	<i>Triplobin maritimum</i>
Sea arrowgrass*	<i>Aster tripolium</i>
Sea aster*	<i>Beta vulgaris subsp. maritima</i>
Sea beet*	<i>Scirpus maritimus</i>
Sea club rush	<i>Bolboschoenus maritimus</i>
Sea club-rush*	<i>Elytrigia atherica</i>
Sea couch*	<i>Tripleurospermum maritimum</i>
Sea mayweed*	<i>Plantago maritima</i>
Sea plantain	<i>Atriplex portulacoides</i>
Sea purslane*	<i>Juncus maritimus</i>
Sea rush	<i>Seriphidium maritimum</i>
Sea wormwood*	<i>Glaux maritima</i>
Sea-milkwort	<i>Carex (sp. indet)</i>
Sedge	<i>Prunella vulgaris</i>
Selfheal	<i>Juncus acutus</i>
Sharp rush	<i>Rumex acetosella</i>
Sheep's sorrel	<i>Capsella bursa-pastoris</i>
Shepherd's-purse	<i>Equisetum x litonale</i>
Shore horsetail	<i>Potentilla anserina</i>
Silverweed	<i>Isolepis cernua</i>
Slender club-rush*	<i>Potamogeton bertholdii</i>
Small pondweed	<i>Phleum bertolonii</i>
Smaller cat's-tail	<i>Crepis capillaris</i>
Smooth Hawk's-beard	<i>Poa pratensis sens. lat.</i>
Smooth meadow-grass	
Smooth sow-thistle / Common	<i>Sonchus oleraceus</i>
sow-thistle	<i>Vicia tetrasperma</i>
Smooth tare	<i>Juncus effusus</i>
Soft rush	<i>Bromus hordeaceus</i>
Soft-brome	<i>Cirsium vulgare</i>
Spear thistle	
Spear-leaved Orache /	<i>Atriplex prostrata</i>
Halberd-leaved Orache	<i>Myriophyllum spicatum</i>
Spiked water-milfoil	<i>Medicago arabica</i>
Spotted medick	<i>Hypericum tetrapetrum</i>
Square-stalked St. John's-wort	<i>Trifolium fragiferum</i>
Strawberry clover	<i>Anthoxanthum odoratum</i>
Sweet vernal grass	<i>Festuca arundinacea</i>
Tall fescue	<i>Thallose liverwort</i>
Thallose liverwort	<i>Lunularia cruciata</i>
Thallose liverwort	<i>Pelia endivifolia</i>
Thallose liverwort	<i>Riccia fluitans</i>
Thrift/ Sea pink*	<i>Armeria maritima</i>
Thyme-leaved sandwort	<i>Arenaria serpyllifolia subsp. serpyllifolia</i>
	<i>Juncus bufonius sens. lat.</i>
Toad rush	<i>Myosotis laxa</i>
Tufted forget-me-not	<i>Vicia cracca</i>
Tufted vetch	<i>Torilis japonica</i>
Upright hedge-parsley	<i>Callitriche platycarpa</i>
Various leaved water starwort	<i>Nasturtium officinale</i>
Water cress	<i>Azolla filiculoides</i>
Water fern	<i>Scrophularia auriculata</i>
Water figwort	<i>Myosotis scorpioides</i>
Water forget-me-not	<i>Equisetum fluviatile</i>
Water horsetail	<i>Mentha aquatica</i>
Water mint	<i>Polygonum hydropiper</i>
Water pepper	<i>Alisma plantago-aquatica</i>
Water plantain	<i>Trifolium repens</i>
White clover	<i>Angelica sylvestris</i>
Wild angelica	<i>Daucus carota subsp. carota</i>
Wild carrot	<i>Daucus carota</i>
Wild carrot	<i>Wild celery</i>
Wild celery	<i>Ligustrum vulgare</i>
Wild privet	<i>Teucrium scorodonia</i>
Wood sage	<i>Cirium eriophorum</i>
Woolly thistle	<i>Achillea millefolium</i>
Yarrow	<i>Iris pseudacorus</i>
Yellow flag	<i>Blackstonia perfoliata</i>
Yellow-wort	<i>Holcus lanatus</i>
Yorkshire-fog	

Braunton Marsh Species List

Birds

List based on:

- Initial list supplied courtesy of
- Mr T. Davis (Devon Birdwatching and Preservation Society)
- Personal communications from Mr R. Jutum

Barn Owl	<i>Tyto alba</i>	Greylag Geese	<i>Anser anser</i>	Robin	<i>Erithacus rubecula</i>
Bar-tailed Godwit	<i>Limosa limosa</i>	Hen Harrier	<i>Circus cyaneus</i>	Rook	<i>Corvus frugilegus</i>
Bearded Tit	<i>Panurus biarmicus</i>	Herring Gull	<i>Larus argentatus</i>	Ruff	<i>Philomachus pugnax</i>
Bitten	<i>Botaurus stellaris</i>	Hobby	<i>Falco subbuteo</i>	Sand Martin	<i>Riparia riparia</i>
Blackbird	<i>Turdus merula</i>	House Martin	<i>Delichon urbica</i>	Sanderling	<i>Calidris alba</i>
Blackcap	<i>Sylvia atricapilla</i>	House Sparrow	<i>Passer domesticus</i>	Scaup	<i>Aythya marila</i>
Black-headed Gull	<i>Larus ridibundus</i>	Jack Snipe	<i>Lymnocyrtus minimus</i>	Sedge Warbler	<i>Acrocephalus schoenobaenus</i>
Blue Tit	<i>Parus caeruleus</i>	Jackdaw	<i>Corvus monedula</i>	Shelduck	<i>Tadorna tadonna</i>
Brambling	<i>Fringilla montifringilla</i>	Kestrel	<i>Falco tinnunculus</i>	Shoveler	<i>Anas clypeata</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>	Kingfisher	<i>Alcedo atthis</i>	Skylark	<i>Alauda arvensis</i>
Buzzard	<i>Buteo buteo</i>	Knot	<i>Calidris canuta</i>	Snipe	<i>Gallinago gallinago</i>
Canada Goose	<i>Branta canadensis</i>	Lapwing	<i>Vanellus vanellus</i>	Song Thrush	<i>Turdus philomelos</i>
Chaffinch	<i>Phylloscopus collybita</i>	Lesser black-backed Gull	<i>Larus fuscus</i>	Sparrowhawk	<i>Accipiter nisus</i>
Chiffchaff	<i>Phylloscopus collybita</i>	Lesser Whitethroat	<i>Sylvia curruca</i>	Spoonbills	<i>Platalea leucorodia</i>
Collared Dove	<i>Streptopelia decaocto</i>	Linnet	<i>Carduelis cannabina</i>	Spotted Redshank	<i>Tringa erythropus</i>
Common Gull	<i>Larus canus</i>	Little Egret	<i>Egretta garzetta</i>	Starling	<i>Sturnus vulgaris</i>
Common Sandpiper	<i>Actitis hypoleucos</i>	Little Grebe	<i>Tachybaptus ruficollis</i>	Stock dove	<i>Columba oenas</i>
Common Turn	<i>Sterna hirundo</i>	Little Owl	<i>Athene noctua</i>	Stonechat	<i>Saxicola torquata</i>
Coot	<i>Fulica atra</i>	Little Stint	<i>Calidris minuta</i>	Swallow	<i>Hirundo rustica</i>
Cormorant	<i>Phalacrocorax carbo</i>	Long-tailed Tit	<i>Aegithalos caudatus</i>	Teal	<i>Anas creca</i>
Crow	<i>Corvus corone</i>	Magpie	<i>Pica pica</i>	Temmincks Stint	<i>Calidris temminckii</i>
Cuckoo	<i>Cuculus canorus</i>	Mallard	<i>Anas platyrhynchos</i>	Tufted Duck	<i>Aythya fuligula</i>
Curlew	<i>Numenius arquata</i>	Marsh Harrier	<i>Circus aeruginosus</i>	Turnstone	<i>Arenaria interpres</i>
Curlew Sandpiper	<i>Calidris ferruginea</i>	Meadow Pipit	<i>Anthus pratensis</i>	Turtle Dove	<i>Streptopelia turtur</i>
Dunlin	<i>Calidris alpina</i>	Merlin	<i>Falco columbarius</i>	Water Rail	<i>Rallus aquaticus</i>
Dunneck	<i>Prunella modularis</i>	Moorhen	<i>Gallinula chloropus</i>	Wheatear	<i>Oenanthe oenanthe</i>
Eider	<i>Somateria mollissima</i>	Mute Swan	<i>Cygnus alor</i>	Whimbrel	<i>Numenius phaeopus</i>
Fieldfare	<i>Turdus pilaris</i>	Oystercatcher	<i>Haematopus ostralegus</i>	White-fronted Goose	<i>Anser albifrons</i>
Gadwall	<i>Anas strepera</i>	Pectoral Sandpiper	<i>Calidris melanotos</i>	Whitethroat	<i>Sylvia communis</i>
Golden Eye	<i>Pluvialis clangula</i>	Peregrine	<i>Falco peregrinus</i>	Whooper Swan	<i>Cygnus cygnus</i>
Golden Plover	<i>Pluvialis apricaria</i>	Pheasant	<i>Phasianus colchicus</i>	Wigeon	<i>Anas penelope</i>
Goldfinch	<i>Carduelis carduelis</i>	Pied Wagtail	<i>Motacilla alba</i>	Willow Warbler	<i>Phylloscopus trochilus</i>
Great Black-Backed Gull	<i>Larus marinus</i>	Pochard	<i>Aythya ferina</i>	Winchat	<i>Saxicola rubetra</i>
Great Tit	<i>Parus major</i>	Raven	<i>Corvus corax</i>	Wood Sandpiper	<i>Tringa glareola</i>
Green Sandpiper	<i>Tringa ochropus</i>	Red-breasted Merganser	<i>Mergus serrator</i>	Woodcock	<i>Scolopax rusticola</i>
Greenfinch	<i>Carduelis chloris</i>	Redshank	<i>Tringa totanus</i>	Woodpigeon	<i>Columba palumbus</i>
Greenshank	<i>Tringa nebularia</i>	Redwing	<i>Turdus iliacus</i>	Wren	<i>Troglodytes troglodytes</i>
Grey Heron	<i>Ardea cinerea</i>	Reed Bunting	<i>Emberiza schoeniclus</i>	Yellow Wagtail	<i>Motacilla flava</i>
Grey Plover	<i>Pluvialis squatarola</i>	Reed Warbler	<i>Acrocephalus scirpaceus</i>	Yellowhammer	<i>Emberiza citrinella</i>
Grey Wagtail	<i>Motacilla cinerea</i>	Ringed Plover	<i>Charadrius hiaticula</i>		

Mammals

List based on:

- National Biodiversity Network
- Billington, G, 2002; Radio tracking study of greater horseshoe bats at Caen Valley Bats Site of Special Scientific Interest. English Nature Research Report number 495
- Personal communications; Fred Smith

Bank Vole	<i>Clethrionomys glareolus</i>
Brown Hare	<i>Lepus europaeus</i>
Brown Rat	<i>Rattus norvegicus</i>
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>
Eurasian Common Shrew	<i>Sorex araneus</i>
Eurasian Pygmy Shrew	<i>Sorex minutus</i>
European Mole	<i>Talpa europaea</i>
European Otter	<i>Lutra lutra</i>
European Rabbit	<i>Oryctolagus cuniculus</i>
Field Vole	<i>Microtus agrestis</i>
Greater Horseshoe Bat	<i>Rhinolophus ferrumequinum</i>
Red Fox	<i>Vulpes vulpes</i>
Stoat	<i>Mustela erminea</i>
Water vole	<i>Arvicola terrestris</i>
Weasel	<i>Mustela nivalis</i>
West European Hedgehog	<i>Erinaceus europaeus</i>
Wood Mouse	<i>Apodemus sylvaticus</i>



BRAUNTON MARSH INTERNAL
DRAINAGE BOARD

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Picture by courtesy of the North Devon AONB

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