Isle of Wight Biodiversity Action Plan
Wetlands Habitat Action Plan

1 Introduction

This Habitat Action Plan has been prepared through consultation with a range of organisations and specialists within the Isle of Wight BAP partnership. It covers a ten-year period from 2002 – 2012, with a review in 2007.

Wetlands have been selected as an action plan habitat for the Isle of Wight to ensure that national objectives for wetland habitats identified under the UK Biodiversity Action Plan are translated into effective action on the Island, taking into account local issues.

This action plan embraces a number of wetland habitats that are identified as individual habitats types within the UK BAP.
These are summarised in table 1:

Table 1: Relationship between Isle of Wight wetland habitats and UK BAP habitats

Habitat type	UK BAP Status	Distribution on the IW
Coastal and flood plain grazing marsh	Priority	Widespread in river flood plains
Reed beds	Priority	The most extensive reed beds occur in the Eastern and Western Yar valleys with smaller areas frequent along streams and ditches
Fens	Priority	Local occurrence
Purple moor-grass and rush pasture	Priority	Local occurrence
Chalk rivers	Priority	Small sections of chalk stream
Rivers and streams	Broad habitat	Widespread
Fen, marsh and swamp	Broad habitat	Common in flood plains

Wet woodlands are also identified as a priority habitat in the UK BAP. It is intended that actions for the conservation of this habitat will be taken forward through the IW woodlands habitat action plan although they frequently occur in association with other wetland habitats identified in this action plan.

Wetland habitats in this HAP also show transitions to coastal habitats such as saltmarshes, saline lagoons and estuaries. Although there are important links between the habitats considered in this HAP and these coastal habitats, actions for them will be developed through the Estuaries HAP.

Wetland habitats often occur in association with other important habitats. In particular, there are often transitions from coastal and flood plain grazing marsh to other coastal habitats including saltmarsh and saline lagoons. These will be considered in an estuaries habitat action plan.

Open standing waters, including ponds and lakes, also often occur within or associated with wetland habitats although the majority are found in different settings and will be considered within a separate action plan.

Wetlands of high biodiversity importance also occur on coastal cliffs and slopes around the Island. Actions needed to conserve these have been included in the Maritime Cliffs and Slopes Habitat Action Plan.

The identification of wetland habitats as a priority for action on the Isle of Wight is based on the following factors:

1. The wetlands of the Island contain examples of a number of priority habitat types identified by the UK BAP.

2. Although no assessment of the magnitude of wetland habitat loss on the Island has been made, reference to historic accounts suggests there has been a widespread and significant loss of wetland biodiversity over the past century. This has included significant loss of habitat from rivers and flood plains through land drainage and agricultural improvement together with losses due to scrub, woodland and reed invasion and changes due to nutrient enrichment.

3. A comprehensive assessment of the condition of the remaining wetland habitat has not been made. Actions to address this deficiency are proposed in section 6. However, it is understood that many of the remaining wetland sites are in poor condition. This may be due to problems of water level control, lack of an appropriate grazing or mowing regime and factors associated with water quality and quantity.

4. Wetland habitats on the Isle of Wight provide habitat for many species of national or local importance. Five wetland species are listed within the UK BAP as priority species with a further four national priority species of bat being strongly associated with wetlands. A further 34 species of national conservation concern (medium or long list) together with 67 species of local conservation concern are also associated with the Island's wetland habitats.

2 Current Status

2.1 Description of the habitat

The wetland habitats considered in this action plan tend to be associated with rivers and their flood plains, or with springs and seepage lines. They are varied in character, but all depend on adequate water supplies of appropriate quality to maintain the specialist groups of plants and animals they have associated with them.

2.1.1 Coastal and flood plain grazing marsh

The most extensive wetland habitat on the Island is coastal and flood plain grazing marsh. The Isle of Wight biodiversity audit and assessment [1] estimates that this habitat covers some 525 hectares. It is defined as periodically flooded pasture or meadow with ditches, containing brackish or fresh water that maintain the water levels. The ditches can be especially rich in plants and invertebrates. Almost all areas are grazed and some are cut for hay or silage. Not all of the grassland in flood plains and coastal grazing marshes is semi-natural, and much has been agriculturally improved. The improved areas that are influenced by saline intrusion are characteristically much more botanically diverse than freshwater examples further inland along the river valleys.

2.1.2 Fens

Fens, as defined by the UK BAP are peatlands that receive water and nutrients from the soil, rock and ground water as well as from rainfall. They can be described as 'poor fens' or 'rich fens'. Poor fens receive their water from acid, base poor rocks such as sandstone, whilst rich fens are associated with water derived from base enriched calcareous rocks such as chalk. Fen vegetation is characteristically short, with a high proportion of sedges and mosses. In poor fens, bog mosses *Sphagnum* spp. predominate, whilst rich fens have carpets of 'brown mosses'. Fens are now extremely rare on the Isle of Wight, with only small isolated examples surviving. Poor fens on the Island are fed with nutrient poor acid water arising from springs and seepages either on hill sides such as Bohemia Bog, or at the edge of flood plains, such as Munsley Bog. Rich fen habitats were once widespread within Freshwater Marshes although much of this has now been transformed into

[1] Isle of Wight Biodiversity Action Plan Steering Group. 2000. Wildlife of the Isle of Wight: An Audit and Assessment of its Biodiversity. Isle of Wight Council.

reed bed. Other small examples of rich fen occur along spring lines associated with the chalk, such as Compton Marsh or as cliff face flushes, such as those on Headon Warren and at Luccombe Chine (these are included within the Maritime Cliff and Slopes HAP).

2.1.3 Purple moor-grass and rush pasture

Nationally, this is a habitat of western Britain where it occurs on poorly draining, usually acidic soils in areas of high rainfall. The vegetation is characteristically species rich and dominated by purple moor-grass, *Molinia caerulea* and rushes, especially sharp-flowered rush *Juncus acutiformis*. This habitat should not be confused with the extensive areas of wet soft rush dominated marshy grassland that occurs within the flood plains of many of the Islands river valleys. However, small examples of this habitat do occur often in association with poor fens such as those at the Wilderness, Bohemia Bog and Munsley Moor.

2.1.4 Chalk rivers

At the base of the central chalk ridge, a number of small streams arise. For a short section of their course, they show affinities with the typical chalk rivers such as those found on the Hampshire mainland. Although lacking the typical water-crowfoots of chalk streams, they display many of the features of the upper winterbourne sections of typical chalk rivers including a diverse aquatic invertebrate fauna and populations of fish such as the bullhead *Cottis gobio* (a species listed on Annex II of the EU Habitats Directive). The best examples of chalk stream habitats on the Island are on the Caul Bourne at Winkle Street, and the Lukely Brook as it flows through Plaish Meadows.

2.1.5 Reed bed

Nationally, extensive reed beds can provide important habitat for a number of specialist breeding birds, such as the marsh harrier or bittern and a number of uncommon invertebrate species. However, the Island's reed beds have mostly evolved due to a lack of management of other wetland habitats within the flood plains and tributaries of the Eastern and Western Yar valleys. In the western Yar, the reed beds between Freshwater Causeway and Freshwater Gate occur over former fen habitats. The reed is generally of good quality and supports populations of a number of typical reed nesting birds such as reed and sedge warblers. In the east of the Island, reed beds are best developed within Brading Marshes where they are often fed with brackish water. Where associated with willow scrub these reed beds support populations of the nationally rare Cetti's warbler. In the Yar Estuary and at King's Quay reed beds occur as part of a natural transition to saltmarsh habitat with the reed beds being tidally inundated. Further reed beds occur on the spring fed slopes of the Islands soft rock cliffs. These cliff face reed beds are described in the Maritime Cliffs and Slopes Habitat Action Plan.

2.1.6 Fen, marsh and swamp

Wetland habitats that fall within this category include areas of tall fen and marsh that occur on permanently wet ground, mostly within river valleys. These areas of habitat are often dominated by a single species such as greater pond-sedge *Carex riparia*, reed canary grass *Phalaris arundanacea* or in brackish situations sea club-rush *Bolboschoenus maritima* forming swamp vegetation. Some forms of soft rush dominated pasture may also be included within this category of habitat type where it is generally referred to as marsh. Fen, marsh and swamp habitats are often derived from the degradation of other wetland habitats due to a lack of appropriate management or a reduction in water table or water quality. Despite this they can still provide good habitat for a number of wetland birds and animals and can be restored through reintroduction of grazing and cutting and changes in water level management to produce more varied and bio-diverse habitats.

2.1.7 Rivers and streams

The Island has numerous small rivers and streams. The largest are the Eastern Yar and Medina. Although rising from the chalk in the south of the Island, these rivers run for most of their length

through the heavily cultivated sandy soils of the lower greensand. The Island's main rivers are biologically impoverished, due to a combination of factors including damaged structure, caused by drainage engineering; poor water quality resulting from suspended sediment .and possibly including high levels of phosphate; and low flows, resulting from abstraction, Smaller rivers that drain from gravel aquifers over the Tertiary clays in the north of the Island are less heavily modified by drainage engineering, but they suffer from water quality problems associated with natural seasonal low flows and locally due to waste water discharges and agricultural run-off. Despite this, some sections of these streams are quite natural, especially where they flow through ancient woodlands such as the Palmer's Brook through Fattingpark Copse and Brocks Copse. Other Island streams are short and drain rapidly to the south coast forming deep ravines or chines as they cut down through the steep coastal cliffs on this side of the Island. Again, many of these streams drain heavily cultivated agricultural landscapes and have poor water quality and impoverished in stream and bankside habitats.

2.2 Wetland Species

The Island's wetlands are home to a rich diversity of plant and animal species including five wetland species that have been identified as priority species within the UK BAP.

Water voles are perhaps one of the most important wetland species on the Island. They remain widespread across the Island despite dramatic national declines. The apparent absence of feral American mink on the Island may be a very significant factor in the maintenance of water vole populations.

Two priority invertebrate species are associated with the Island's wetlands. The Desmoulin's whorl snail, *Vertigo moulinsiana,* occurs in tall fen vegetation and has been recorded at Freshwater Marshes. This species is also listed on Annex II of the EU Habitats Directive in recognition of its threatened status throughout Europe. The other priority invertebrate found in the Islands wetlands is the hornet robber-fly *Asilus crabroniformis*. This species is not an exclusive wetland species, but is associated with extensively grazed grasslands where the adult flies lay their eggs on the dung of cattle and other grazing livestock. Use of ivermectin and related pesticides to control livestock parasites and loss of extensively grazed semi-natural grasslands is believed to present the main threat to this species.

The only wetland priority bird species to occur on the Island is the reed bunting. This species is still breeding in suitable scrub and wetland habitats across the Island with particular concentrations in the Eastern Yar valley, Freshwater Marshes, Newtown Harbour and Thorness Bay.

2.3 Distribution and Extent

The total extent of wetland habitats on the Island has been mapped as part of the Isle of Wight biodiversity audit and assessment. The results of this are summarised in table 2.

Table 2: Extent of wetland habitats on the Isle of Wight

Audit habitat types	**BAP habitat types (see table 1)**	**Area**
Reed fen	Reed bed	10.2 ha
Flush	Fen	1.0 ha
Fen meadow	Purple moor-grass and rush pasture	3.0 ha
Fen	Fen	1.7 ha
Swamp	Fen, marsh and swamp	32.0 ha
Abandoned grazing marsh	Fen, marsh and swamp	81.3ha
Grazing marsh	Coastal and flood plain grazing marsh	525.3 ha
Total		**654.5 ha**

2.4 Legislation and Site Designation

Most of the coastal wetlands along the Solent shore of the Island have been included within the Solent and Southampton Water Ramsar Site. Ramsar Sites are wetlands of International Importance. The Solent and Southampton Water Ramsar Site has been listed for, amongst other things, its particularly good representation of wetland habitats characteristic of the Atlantic biogeographic region. This includes the extensive grazing marshes, reed beds and associated marshy grasslands within Brading Marshes and the areas of swamp and reed bed within Kings Quay Shore SSSI and at Thorness Bay. In the west of the Island the grazing marshes and swamps of the Thorley Brook and Barnfield Stream are also included in the Ramsar Site as part of the Yar Estuary SSSI.

As well as the coastal wetlands mentioned above, a large proportion of wetland habitat on the Island has been notified as Sites of Special Scientific Interest (SSSI) or designated through the Unitary Development Plan as Sites of Importance for Nature Conservation (SINC).

A summary of wetland habitats present within the main SSSI and SINC on the Island is summarised in tables 3 and 4

Table 3: Distribution of wetland habitat within main SSSI (for BAP habitat equivalents see table 2)

Site Name	Grazing marsh	Abandoned Grazing Marsh	Marshy grassland	Poor fen	Swamp	Reed Fen
Cridmore Bog	17.88		11.59	1.36		
The Wilderness			2.65			
Kings Quay Shore					2.73	
Ryde Sands	7.66				1.65	
Freshwater Marsh		5.62			2.08	4.69
Brading Marshes	284.12*	3.12	23		10.54	4.49
Alverstone Marshes	3.26	5.29				
Medina Estuary					2.09**	
Thorness Bay	5.58	2.40	0.65		2.92	
Yar Estuary	30	1.98			6.63	
Total	**64.38**	**18.41**	**37.89**	**1.36**	**26.55**	**9.18**

* not all in SSSI
** includes 1.34 ha of sea-clubrush swamp

Table 4: Distribution and condition of wetland SINC's

SINC name	Grid ref.	Area ha	Cond'	Subsidiary habitat
Principal Habitat: Wetlands: fens, swamps and marshes				
River Medina: Shide	SZ 503887	1.94	F	River
River Medina: Shide to	SZ 502874	6.68	F	Rivers and streams
Brading Marshes North	SZ 615881	32.95		
Lukely Brook	SZ 491886	1.38	F	River
Munsley Bog (Gt Budbridge)	SZ 530827	8.46	U	Willow carr
Kennerley Heath (Gt	SZ 516835	16.01	U?	
Wydcombe Estate	SZ 505782	24.47	U	Woodland, acidic grassland,
Bohemia Bog	SZ 514833	3.34	F	Acid grassland
Upper Dolcoppice	SZ 505792	15.02	?	Ancient semi-natural woodland, acid grassland

SINC name	Grid ref.	Area ha	Cond'	Subsidiary habitat
Moor Farm	SZ 537833	12.82	U	
Roud (Upper Yar valley)	SZ 515803	4.48	U	Wet grassland and scrub
Scotland Farm (Upper Yar	SZ 520820	14.73	U	Carr woodland
Nettlestone Marshes	SZ 620908	7.12	F?	Unimproved neutral grassland
Great Budbridge	SZ 530833	15.15	U?	Flower-rich meadows, and scrub
Morton Marsh	SZ 606861	6.79	?	
Sandown Levels	SZ 604850	17.49	U	Reedbeds
Pope's Farm Marsh	SZ 566853	2.09	F	
Compton Grange Marsh	SZ 380841	5.3	U	
Perreton Marsh	SZ536858	14.33	F?	Acid grassland, woodland
Sudmoor Dyke	SZ 387835	17.79	U?	Withybeds, herb-rich pasture &
Plaish Water Meadows	SZ 480874	9.46	F	Stream
Compton Marsh	SZ 368852	8.81	F	Maritime grassland
Redway	SZ 536845	12	U	Semi-natural woodland
Principal Habitat: Grazing Marsh				
Gurnard Marsh	SZ 474953	7.86	U	
Thorley Meadows	SZ 368893	9.52	?	

Condition assessment F = Favourable, U = Unfavourable

2.5 Summary of Important Sites

The most extensive wetland habitats on the Island are found within the Eastern Yar Valley. These include the internationally important wetlands of Brading Marshes SSSI that form part of the Solent and Southampton Water Ramsar Site. Brading Marshes are of comparatively recent origin, having being claimed from the sea at the end of the 19th century. They comprise extensive areas of coastal and flood plain grazing marsh, together with smaller areas of marshy grassland, swamp and reed bed. They display excellent transitions from freshwater to saline wetlands including saltmarsh and saline lagoons together with associated areas of neutral grassland, acid grassland, woodland and scrub. Brading Marshes are important for overwintering wildfowl including wigeon, teal and brent geese as well as breeding reed bed species such as Cetti's warbler and reed bunting. The system of ditches and dykes that drain the marshes also supports a rich aquatic invertebrate fauna.

Further up the Eastern Yar Valley are the wetlands of Alverstone Marshes. The river Yar runs through the marshes and has been much modified by dredging, straightening and other drainage engineering. The wetland habitats in the Marshes are now hydrologically divorced from the river, and are largely dependent upon water arising from springs and seepages that emerge at the edge of the flood plain and smaller tributary streams such as Hill Heath Drain. Some excellent wetland habitats remain in the marshes, including areas of fen meadow and purple moor-grass and rush pasture in which species such as marsh cinquefoil *Potentilla palustris*, bog-bean *Menyanthes trifoliata* and marsh violet *Viola palustris* can all be found. Other areas of the marsh have been damaged by drainage and support degraded reed beds or have been abandoned and reverted to greater pond-sedge *Carex riparia* swamp.

The Wilderness and Cridmore Bog SSSIs are located at the head of the Medina Valley. These two SSSI represent the relicts of a once extensive complex of heathland and acid wetland in this part of the Island. They retain some species rich examples of fen and rush pasture with abundant bottle sedge *Carex rostrata* and marsh cinquefoil forming a fen vegetation type described by the National Vegetation Classification (NVC) as *Carex rostrata – Potentialla palustris* tall herb fen (S27). This fen type is rarely found in the lowlands of England. Changes in water quality in the river Medina and past drainage engineering have altered the habitats found in these two SSSI, with species associated with nutrient poor acid wetlands such as the insectivorous sundews *Drosera* spp. becoming extinct. Some species of wet heath and poor fen such as the bog myrtle *Myrica gale,* do however survive.

The Eastern Yar Valley near Rookley contains some of the most important areas of acid wetland habitat remaining on the Island. Bohemia Bog is a small wetland fed by acid base poor water arising from a spring line at the foot of a small hill south east of Rookley. The habitats present in this site are remarkable both in the Island and regional context and include examples of *Narthecium ossifragum – Sphagnum papillosum* valley mire (M21) which grades into a fine example *Molinia caerulea – Cirsium dissectum* fen meadow (M24). The flora of Bohemia Bog is very rich and includes good populations of the insectivorous species such as round leaved sundew *Drosera rotundifolia* and pale butterwort *Pinguicula lusitanica*. This is the only site on the Island were these two species occur together.

The west of the Island also has some important wetlands. Freshwater Marshes at the head of the Western Yar Valley was once one of the most important fens in either Hampshire or the Isle of Wight. However, drainage work and encroachment of common reed and scrub has resulted in the loss of many of the most exacting fen species recorded from these marshes in the past. Despite this, the site still has a rich fen flora, including the uncommon marsh fern *Thelypteris palustris*, marsh orchids *Dactylorhiza praetermissa* and lesser water-parsnip *Berula erecta.* The reed beds that have replaced the fen habitat now attract populations of reed nesting birds including reed, sedge and Cetti's warblers. The river Yar that runs through the site has been deepened for drainage purposes in the past and as with many wetlands on the Island, the marsh is maintained by springs and seepages that flow across the marshes from the edge of the flood plain to the river.

Further down the Yar Valley towards the sea are some good examples of coastal grazing marsh along the Thorley Brook and Barnfield Streams. These show well developed transitions from fresh to brackish water conditions and in winter attract a range of wildfowl including wigeon, teal and shoveler. The flora of these marshes includes a number of uncommon and nationally scarce plant species including divided sedge *Carex divisa*, marsh mallow *Althaea officinalis* and bulbous foxtail *Alopecurus bulbosus*.

Important transitions from swamp and reed bed to saltmarsh can also be found along the small stream valley that flows into Thorness Bay. Many of the nationally scarce plants found in the Thorley Brook and Barnfield Stream valleys can also be found in the marshes at Thorness Bay.

The Island also has some important spring fed fens occurring at the foot of the chalk downs. These are often small and isolated but support a rich fen flora including marsh orchids, marsh marigold *Caltha palustris*, bog pimpernel *Anagallis tenella* and brown sedge *Carex disticha*. Compton Marsh, situated on the cliff top above Compton Bay is perhaps the best developed of these spring fed fens although they also occur in Brading Marshes and on the north side of Tennyson Down at Moons Hill.

Historically, the Island's streams and rivers have had an impoverished flora and fauna. Many species that are characteristic of mainland rivers, such as minnow, crayfish, most stoneflies and water-crowfoots, are not native on the Island. The Island's streams and rivers have been badly degraded through drainage works and regular dredging. The resultant straightened river courses flow along a channel sunken deeply below the level of the adjacent flood plain and lacking the in channel features of pools, riffles, bars and shoals associated with more natural rivers. As a consequence, the aquatic flora of the Island's rivers is very poor or in many places totally absent and it is rarely able to achieve its full potential. It is ironic that the richest aquatic flora on the river Medina has been recorded from the canalised concrete lined sections at Blackwater where a combination of weirs and the stable substrate provided by the concrete channel has improved habitat conditions. Despite these problems, some sections of more natural river do retain a diverse flora and fauna. The best of these are perhaps the upper reaches of the Caul Bourne, the Gunville Stream and Lukely Brook near Newport and the small streams flowing though ancient woodlands in the north-east of the Island such as the Palmer's Brook and Blackbridge Brook.

3 Current Factors affecting the habitat

3.1 Drainage engineering and flood alleviation

The Island's rivers and wetlands have suffered from a long period of intensive land drainage activity. This has resulted in several important consequences for wetland biodiversity:

1 Rivers have often become divorced from the function of their flood plains so that wetland habitats that remain on the flood plains are maintained by springs and seepages arising at the edge of the flood plain. For most of the year, the river acts simply as a drain to remove this water supply.

2 River channels have often become uniform in structure and lack in channel features such as pool and riffle sequences, meanders, bars and shoals. They are also deeply incised below the level of the flood plain so draining the wetland habitats that remain upon it.

3 The lower greensand that forms the bed of the Medina and Eastern Yar along much of their course is unstable and provides a poor substrate for rooting aquatic plants apart from those tolerant of silty conditions such as bur-reed *Sparganium erectum* which often chokes the river channel. It may be that, in a natural state, these rivers had a more gravelly bed composed of greensand concretions that have been removed through dredging.

4 Steep stream sides prevent the development of much marginal vegetation apart from occasional dense stands of stinging nettle, bitter-sweet *Solanium dulcamara* and coarse grasses such as false oat-grass *Arrhenatherum elatius*.

5 Water travels from source to sea through the river system very rapidly, resulting in flash flooding in the lower reaches of the river. In the upper reaches, the watercourses and associated wetlands drain rapidly and are prone to drying out.

In other instances, drainage systems have been installed to improve agricultural production. The most significant of these is within Alverstone Marshes, where a drainage culvert actually passes under the river bed, so draining the flood plain fen and reed beds below the level of the river.

There is an urgent need to restore river channels to re-integrate them with their flood plains and restore biological function. This might include restoration of cut-off meanders, raising of bed levels and recreation of in-channel features. There is also a need to restore wetlands in the upper reaches of river systems to reduce flash flows and reduce problems of low flows. Some indication of the degree to which biological diversity has been affected by the combination of river engineering and water quality could be obtained by comparing largely unmodified 'near natural' sections of streams with those within the main river network. These often small sections of stream can still support a rich invertebrate fauna, and be used to set targets for the restoration of those streams and rivers that have been degraded.

3.2 Water quality

Rivers on the Isle of Wight are regularly monitored by the Environment Agency to look at trends in chemical and biological quality. The past decade has seen a general improvement in water quality on the Island. Of the 88 km total length of monitored rivers, 27 km has shown a significant improvement over the period whilst only 2 km has decreased in quality.

In the north of the Island, streams flowing into Newtown Harbour such as the Caul Bourne and Rodge Brook still receive sewage either from small waste water treatment works such as those at Newbridge and Shalfleet or as overflows from septic tanks such as those at Porchfield. These pollutant discharges have a significant effect upon the water quality in the lower reaches of these two streams and upon the internationally important estuary of Newtown Harbour.

Elsewhere, on the larger rivers water quality is affected by nutrient enrichment. There is a need for better understanding of the effects of phosphate arising from wastewater treatment works. Remedial action may be required.

Other forms of pollution are associated with agriculture, and include diffuse sources of phosphate, nitrate and pesticides, as well as silt and sediment eroded from fields and leakage of silage

effluent. These diffuse sources of pollution can be difficult to control, and require catchment-based land management strategies and advice to farmers if they are to be resolved.

Water quality has an important influence on the aquatic flora and fauna found within the river channels, and any remaining wetlands that are irrigated by river water. In addition silt and sediment loads in the rivers is high, especially during times of high rainfall. This problem is made even more acute on the Medina and Eastern Yar, where much of the river catchment is located over the intensively farmed sandy soils of the lower greensand. Water quality in the summer months is further exacerbated by low flows.

3.3 Low flows and water abstraction

The Eastern Yar is very heavily affected by abstraction both for public water supply and agricultural purposes. At times this can cause the river to almost stop flowing below the Sandown Water Works abstraction point at Burnt House weir where 90% of the flow can be lost to the public water supply. Further upstream abstraction for agricultural irrigation also has an effect on river flows during the summer months. Low summer flows in the Eastern Yar, combined with the effects of river engineering and poor water quality result in highly impoverished lower reaches of the river. The River Medina is also used for abstraction both for agriculture and public water supply although the impacts of these abstractions on the biodiversity of the river and its wetlands are less apparent.

The Lukely Brook upstream of Carisbrooke is also influenced by water abstraction. This is collected from under the Plaish Water Meadows via a collecting main, which feeds Carisbrooke pumping station and from the Bowcombe Pumping Station. The effects of this abstraction on the flora and fauna of the meadows and the Lukely Brook have not been properly investigated, although it is probable that during dry summer months this abstraction will have a significant impact upon these wetlands.

In many of the river valleys, irrigation reservoirs have been constructed. These were initially intended to provide winter flood storage to irrigate farmland in the summer. However, subsequent investigation by the Environment Agency has demonstrated that many of these reservoirs in sensitive wetland habitats are in fact fed with ground water during the summer, and hence abstraction during the summer could affect adjacent wetland habitats. As a consequence, twelve new abstraction licences have been issued by the Environment Agency to minimise the impact of these reservoirs on adjacent wetlands. In some instances, the reservoirs themselves have developed to provide wetland habitats of high biodiversity value.

The impacts of abstraction from the chalk and lower greensand aquifers on wetland biodiversity has not been properly investigated. A network of boreholes has been installed throughout the lower greensand in the Medina Valley augment flows in the Eastern Yar for abstraction at Burnt House. The monitoring boreholes have not shown any impact upon wetland habitats in this part of the Island but the data are not yet conclusive. The Minimum Residual Flow could be modified to protect Brading Marshes and the lower Eastern Yar, but there would be a severe impact on the reliability of the Public Water Supply.

Abstraction for trickle irrigation, particularly of horticultural crops, is not subject to abstraction licences. This allows significant quantities of water to be abstracted without control or monitoring. The government is expected to take action to close this loophole through new legislation in 2003.

3.4 Lack of management

The river valleys of the Island were once part of the mixed farming system that maintained stock grazing with hay production and arable farming. The wetlands of the river valleys or Moors as they are termed locally provided summer grazing for livestock and lush hay meadows. With changes in agriculture over recent decades, it has become uneconomic to graze the wet Moors which have now become isolated within the intensively farmed landscape of the river catchments. This has resulted in changes in the vegetation and associated fauna of these wetlands, with coarse swamp vegetation dominated by single species replacing the varied and species rich flora that would have

been present when grazed. Abandonment of agricultural use has also resulted in former ditches and drains becoming derelict. The loss of these open water habitats has also reduced biodiversity but more importantly, the lack of drainage makes some parts of the flood plain impossible to graze or mow. Restoration of wetland management may therefore require some careful restoration of the drainage system and in the future, cyclical management of its vegetation. In other places where deep drainage ditches have been created within wetlands, such as those within Alverstone Marshes, drying of the wetland has allowed scrub and woodland to invade and replace the wetland habitats. The presence of this scrub and secondary woodland can provide valuable wildlife habitat but it must be maintained in balance with the more open habitats to sustain biodiversity.

3.5 Fragmentation and isolation

The spring fed wetlands that remain in good condition are often isolated from other wetlands due to the localised nature of the water source they depend upon. These small sites are highly vulnerable to changes in ground water levels and quality, and to changes in land management. Other wetland sites are isolated in an intensively farmed agricultural landscape. This makes them vulnerable to the effects of agricultural pollution from pesticides, fertiliser and silt run-off. It can also make it difficult to restore or maintain an appropriate grazing regime on these wetlands. Other wetland habitats need to be of a minimum size to support certain specialist species, for example reed beds and flood plain grasslands need to be of a minimum size to support certain breeding birds. Where these habitats occur in small fragmented patches, their value to biodiversity can be significantly increased by linking them into larger areas.

3.6 Sea level rise

Sea levels are predicted to rise by about 50cm in the next 50 years. This will place many coastal and flood plain grazing marshes and their associated wetland habitats under threat of saline inundation. Wetlands that could be radically changed because of sea level rise include Brading Marshes; the marshes of Thorley Brook, Barnfield Stream and between Freshwater Causeway and Afton Road; Nettlestone Marsh and Seaview Duver; Wootton Mill Pond; Thorness Marsh; and Gurnard Marsh. To prevent these coastal marshes becoming inundated with the sea would require significant expenditure on flood defence, which would in turn exacerbate problems of coastal squeeze and fluvial flooding due to increasing loss of flood storage capacity. The only long-term sustainable solution is to allow coastal habitats to migrate inland in line with rising sea levels, so reverting these wetlands to intertidal habitats. However, this needs to be carried out in a controlled manner. As a consequence, fresh and brackish water marsh habitats may be lost unless they also can be allowed to migrate inland. This will have implications for land-use, and appropriate policies and financial incentives will need to be developed to encourage landowners and managers to accept such change.

1.7 Fisheries

Little is known of the fish populations of the Island rivers and streams. Some are known to support fish populations of nature conservation importance such as the bullhead and brook lamprey. However, this information has never been collated into any coherent review of fish diversity and population levels in Island rivers. Some rivers and streams are also thought to support populations of migratory fish. Some such as the sea trout migrate to the sea from spawning sites at the head of the river. Others, such as the dace, may migrate within the river from headwaters to lower reaches. Little or no information is available concerning the distribution and health of these fish populations. The construction of weirs on many rivers to maintain water levels or assist with abstraction can pose a significant barrier to the passage of migratory fish. In rivers and streams known to support populations of migratory fish, steps should be taken to either remove the obstruction or provide suitable fish passes.

4 Current Action

4.1 Site and Species Protection

4.1.2 Site designation

There are currently no plans to notify new wetland sites as SSSI on the Isle of Wight.

The eastern part of Alverstone Marshes was de-notified in 2001, due to the fragmentation of the remaining wetland habitat resulting from land drainage, agricultural intensification and landfill operations.

SINC identification is ongoing on the Island. Further wetland SINCs may be identified by the IW Council.

English Nature has a number of agreements (under Section 15 of the National Parks and Access to the Countryside Act) on wetland SSSI.

4.1.3 Purchase of additional reserves or properties

Given the poor state of the agricultural economy, it is possible that further areas of wetland or areas with the potential for restoration to wetland, will become available for purchase by nature conservation organisations. Further action to purchase wetlands by nature conservation organisations needs to be planned and coordinated.

4.1.4 Habitat management

Some wetland habitats (reed beds and swamp) are easier to create than others. Creation of new wetland habitats should not be at the expense of other existing wetland habitats.

Wetlands are a target habitat for the Countryside Stewardship Scheme, administered by DEFRA through the Rural Development Service (RDS). This scheme provides payments for maintaining and enhancing wetland habitats, although there is only a limited pool of funding and funding has to be prioritised.

The Eastern Yar Project, funded by Island 2000 Trust and the Environment Agency, has provided assistance to farmers and landowners in the Yar Valley to apply for funding for wetland restoration through the Countryside Stewardship Scheme (CSS). Advice is also given to landowners to reduce run-off of silt and chemicals from arable land in the Yar Valley catchment, including assistance with applications to revert arable land to permanent pasture through the CSS. The Island 2000 Trust, assisted by the RSPB, has successfully bid for Aggregates Levy funding for wetland restoration works at Brading Marshes, Alverstone Marshes Hasely Manor and Hale Manor.

English Nature together with Wight Wildlife and SEEDA is funding two projects aimed at identifying the potential for promoting agricultural systems that will result in the maintenance and restoration of extensive grazing systems on the Island. This may lead to the employment of a grazing project officer to assist in the promotion of wetland grazing schemes and the development of a grazing forum, through which information can be circulated concerning the conservation and restoration of wetlands through appropriate agricultural management.

The RSPB have recently purchased most of Brading Marshes SSSI and are planning extensive habitat management to restore and enhance wetland habitats within the marshes.

The Environment Agency is starting the preparation of a Catchment Abstraction Management Strategy (CAMS) for the Isle of Wight in August 2002. This will be consulted upon in the summer of 2003 with the intention of identifying catchments that are over or under abstracted and developing policies that will deliver sustainable abstraction levels across catchments.

The CAMS is linked to the Eastern Yar Fluvial and Coastal Strategy. This will be seeking to restore over dredged and engineered sections of the river in conjunction with providing flood storage in the flood plain. It will also consider the implications of sea level rise and the future management of Brading Marshes and Bembridge Harbour.

The Environment Agency has also been implementing the Newport Rivers Project, which seeks to work with developers in the urban area to restore rivers such as the Lukely Brook and Medina as they flow through the urban areas of the town. This includes removal of concrete channels, restoration of in-channel features and management of bankside habitats to enhance biodiversity. A new fish pass has also been installed on the Lukely Brook to assist the passage of migratory fish to its headwaters.

4.2 Survey, research and monitoring

The Environment Agency undertakes regular biological and chemical sampling of watercourses throughout the Island, which provides a valuable indication of the quality of aquatic habitats.

Wight Wildlife is planning to undertake (2002/3) a repeat survey of water vole populations on the Island to update information from previous surveys.

English Nature have undertaken site quality monitoring of all wetland SSSI on the Island in recent years and aim to ensure that 95% of all sites are in favourable or recovering condition by 2010.

In 1996, the Environment Agency commissioned the Hampshire and Isle of Wight Wildlife Trust to undertake a River Corridor Survey of all the Island's main rivers. The results of this survey have been compared with an earlier survey undertaken by Southern Water Authority and the Trust in 1984. These surveys show the impoverished nature of the Island's water courses and reveal little improvement in the situation between the two surveys.

4.3 Action for species

Appendix 1 gives details of species on the Isle of Wight found primarily in wetland habitats. Action proposed in this Plan will be the principal means of conserving most of these species. In some cases, additional action plans and programmes will also contribute to conserving priority species.

4.4 Action through policy and legislation

Much of the south of the Island was included with a Nitrate Vulnerable Zone (NVZ) in 2002. A NVZ Action Programme will be starting within this area from the 19 December 2002. This places limits on the quantity of nitrogenous fertiliser applied to farmland and restricts the time of year when this might be applied. It also controls the way in which nitrogen is applied to the land to limit the potential for run-off and ground water contamination. There are also rules concerning the storage of slurry and a requirement to keep records of fertiliser application. As most nitrogenous fertiliser is applied in combination with phosphate the NVZ Action Programme is also likely to reduce the impact of other nutrients on wetland biodiversity.

5 Objectives and Targets

The overall aim of this Plan is to protect and enhance biodiversity of wetland habitats. This broad aim translates into the specific objectives set out below. Where feasible, objectives have been allocated targets against which achievement can be measured. The 'Proposed Action' table in section 6 identifies the action to be taken to meet these objectives.

	Objectives	**Proposed Actions**
A	Ensure no future loss or degradation of wetlands: Maintain the extent and the quality of the existing wetland resource and ensure no further fragmentation	1, 2, 3, 4, 5, 7,8, 9,12,19, 20, 30, 31, 39
B	Increase the extent of wetland habitats by 80 ha as specified in Draft Grazing and Grassland Management Topic Report. Seek to extend the area of wetland habitats and reduce the effects fragmentation and isolation.	9, 10, 12,20, 30, 31, 33, 34, 39
C	Improve the quality of wetlands including improvements to water quality and quantity, restoration of river and flood plain function and adoption of appropriate grazing and mowing regimes. Seek to restore to favourable condition 95% of all wetland SSSI and 75% of other sites by 2012	4, 6, 7, 8, 10, 11,12,13,14,15,16 , 17,18,19, 20, 21, 30, 31, 38,39,
D	Ensure that the needs of the Isle of Wight priority wetland species are met	5, 10, 22, 25, 38
E	Improve knowledge of distribution, status and habitat requirements of wetlands and wetland species on the Isle of Wight through appropriate research, survey and monitoring.	23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 35, 36, 37, 42
F	Communication, Awareness and Promotion: Promote the importance of wetlands, their associated species and threats to them. Communicate with and provide information to key sectors including statutory agencies, NGOs, landowners and managers, schools, community groups and members of the public	21, 38, 40 41, 42, 43

6 Proposed Action

The following table lists the actions required to achieve the objectives set out in this plan. Each action has been assigned to one or more Key Partners. Key Partners are those organisations that are expected to take responsibility for the delivery of the actions assigned to them, according to the targets set in this Plan. Other organisations may also be involved in the delivery of action and they have been indicated in the Others column.

Key to symbols in Action Table:

- ♦ To be completed by the indicated year. Work can commence at any time before the due date, at the discretion of the key partner.
- ♦⇨ Design or production of a plan/strategy to be completed by this year and then followed by its implementation.
- ➡ To start by the indicated year and usually followed by ongoing work. A start arrow in year 2002 can indicate a new action or a new impetus to existing work.
- ⇨ Work that has already begun and is ongoing.

Key to Organisations in Action Table

IWC = Isle of Wight Council, EA = Environment Agency, EN = English Nature, DEFRA = Department for Environment, Food and Rural Affairs, WW = Wight Wildlife, HIWWT = Hampshire and Isle of Wight Wildlife Trust, WNF = Wight Nature Fund, NT = National Trust,
CLA = Country Landowners Association, NFU = National Farmers Union, RSPB, I2KT = Island 2000 Trust, AONB = IW AONB Project,
SW = Southern Water

	ACTION	DELIVERY BY		YEAR						MEETS OBJ.
		Key Partner	Others	2003	2004	2005	2006	2007	2013	
Habitat Protection										
1.	Review the selection of SSSI to ensure all relevant sites are designated.	EN	ALL						➡	A
2.	Review SINC criteria for wetlands and in particular rivers and streams.	IWC	WW, EN,			♦				A
3.	Ensure that all suitable wetlands that meet SINC criteria are identified.	IWC	WW	⇨						A

	ACTION	DELIVERY BY		YEAR						MEETS OBJ.
		Key Partner	**Others**	**2003**	**2004**	**2005**	**2006**	**2007**	**2013**	
4.	Seek to acquire existing and potential wetland sites for nature conservation management, particularly those that will facilitate habitat change to accommodate sea level rise	HIWWT/ RSPB	WNF	⇨						A, C
5.	Ensure that all flood plains and wetlands are safeguarded from development through forward planning and development control.	IWC/EA	EN, WW	⇨						A, D
6.	Take opportunities to work with developers to promote wetland habitat restoration, especially in urban areas.	IWC/EA	I2KT, WW	⇨						C
Habitat Management, Incentive Schemes and Other Resources										
7.	Review all SSSI supporting wetland habitats and ensure 95% are under favourable and appropriate management by 2010	EN		⇨						A, C
8.	Seek favourable and appropriate management of 75% of SINCs that support wetland habitats.	WW, DEFRA, I2KT	ALL	⇨						A, C
9.	Review extent and condition of wetland SINC in 5 years to assess progress towards objectives	IWC	WW					➡		A, B
10.	Incorporate management requirements of priority wetland habitats and/or species when developing, revising and/or updating incentive schemes.	EN/ DEFRA/ EA	ALL	⇨						B, C, D
11.	Review the potential for modifying agri-environment objectives to include control of erosion and diffuse pollution in floodplains.	DEFRA	EA/EN/ WW/ RSPB		♦					C

	ACTION	DELIVERY BY		YEAR						MEETS OBJ.
		Key Partner	**Others**	**2003**	**2004**	**2005**	**2006**	**2007**	**2013**	
12.	Encourage further uptake of CSS schemes in support of above actions and objectives.	DEFRA	WW/ I2KT	⇨						A, B, C
13.	Develop a strategy for river restoration of the Eastern Yar and Medina rivers and their tributaries identifying targets for channel morphology, bed composition, flow characteristics etc.	EA	I2KT	♦⇨						C
14.	Prepare and implement catchment abstraction management strategy (CAMS) for the Isle of Wight	EA/SW	ALL	♦⇨						C
15.	Work with farmers and land managers to reduce the effects of agricultural run-off to streams and rivers	DEFRA/ EA	WW/ I2KT	⇨						C
16.	Work with Southern Water plc and others to reduce the impact of waste water discharges to streams and rivers, in particular the impact nutrients	EA	SW	⇨						C
17.	Make representations through AMP4 to secure funding for improvements to water quality and water resources	EA/ WW/ EN	DEFRA /SW	♦						C
18.	Require abstractions for trickle irrigation of horticultural crops to be subject to licence from the Environment Agency (Water Bill programme)	EA		♦⇨						C

	ACTION	DELIVERY BY		YEAR						MEETS OBJ.
		Key Partner	**Others**	**2003**	**2004**	**2005**	**2006**	**2007**	**2013**	
19.	Develop grazing animal project to facilitate grazing and mowing of wetlands to improve biodiversity.	WW	ALL	♦⇨						A, C
20.	Produce and implement the Eastern Yar Fluvial and Coastal Strategy to included revised flood plain water levels to benefit flora and fauna.	EA, IWC	RSPB/ I2KT/ WW/ EN	♦⇨						A, B, C
21.	Promote the appropriate and beneficial management of land adjacent to isolated and vulnerable wetlands, particularly where this creates mosaics of bio-diverse habitats	DEFRA,	WW/ I2KT IWC/ EN	⇨						C, F
Species Action										
22.	Encourage landowners/ managers and their advisors to manage their land appropriately for species on IW BAP audit	WW	EN/ I2KT	⇨						D
23.	Review status and distribution of fish populations in IW streams and rivers and develop strategy to conserve, restore and enhance native fish populations	EA		♦⇨						E
24.	Seek to reduce or remove obstructions to fish migration in particular on streams and rivers where migratory fish populations are known to survive	EA		♦⇨						E
25.	Develop a monitoring strategy for IW priority species which occur in wetland sites	WW		♦⇨						D, E

	ACTION	DELIVERY BY		YEAR						MEETS OBJ.
		Key Partner	**Others**	**2003**	**2004**	**2005**	**2006**	**2007**	**2013**	
Survey, Research and Monitoring										
26.	Produce a survey strategy for wetland habitats to complement actions within this HAP. This should be based upon a phase 1 survey of the Island to identify all wetlands of biodiversity value followed by phase 2 survey of such sites	IWC	WW EN	♦⇨						E
27.	Implement a rolling re survey programme for wetland SINCs	IWC	NT WW EN						➡	E
28.	Undertake targeted assessment of effects of abstraction on lower Eastern Yar (below Burnt House Weir), Lukely Brook (Plaish Meadows) and Caul Bourne	EA		➡						E
29.	Create and maintain a database of species rich fens and rush pastures that may act as donor sites of seed/propagules for wetland restoration	WW						♦		A, B, C, E
30.	Design and implement a monitoring scheme to assess favourable condition of wetlands in SINCs.	IWC	EN					➡		E
31.	Collate information on uptake of wetland and waterside land options (water level, fen, reed bed, ditch management) of Countryside Stewardship Scheme	DEFRA	WW/ EN	⇨						B
32.	Assess the contribution of agri-environment schemes to the condition of UK BAP Priority Habitats	DEFRA	EN/ WW					♦		B
33.	Identify 'near natural' stream sections in upper river catchments to characterise biological and water quality and provide targets for river restoration of modified and impacted rivers and streams	EA					➡			E

	ACTION	DELIVERY BY		YEAR						MEETS OBJ.
		Key Partner	**Others**	**2003**	**2004**	**2005**	**2006**	**2007**	**2013**	
34.	Monitor level of nutrient inputs of streams flowing into Newtown Harbour and assess relative contribution of point and diffuse discharges as part of Review of Consents under the Habitats Directive	EA/EN	SW			♦				E
35.	Produce annual report on results of fish population monitoring in IW rivers and wetlands with special reference to BAP and migratory species	EA		➡						E
Communication and Publicity										
36.	Compile an index of information sources and guidance on good management practices for rivers, streams and wetlands and associated priority species	HIWWT/ EA	EN/ IWC	⇨						C, D, F
37.	Convene a grassland and grazed habitats forum as a means of disseminating best management practice for grazed and mown wetland habitats	WW	IWC/ NFU/ CLA	➡						A, B, C
38.	Promote the ecology and conservation requirements of wetlands and associated priority species, particularly amongst farmers and their advisors.	WW	IWC/ NFU/ CLA		➡					F
39.	Raise awareness of incentive schemes and projects relevant to the management of wetlands.	WW	ALL	⇨						F
40.	Identify sites which demonstrate good management practice and river restoration and promote those sites	I2KT/ RSPB	WW	⇨						E, F
41.	Increase public awareness of the Island's wetlands, including production of promotional material and encouragement of public access to appropriate sites. Include community involvement and flagship species where appropriate	I2KT/ AONB/ RSPB	ALL	⇨						F

7 Sources of Information

1. Isle of Wight Biodiversity Action Plan Steering Committee. 2000. *Wildlife of the Isle of Wight and Audit and Assessment of its Biodiversity*. Isle of Wight Council

2. English Nature, 1998. *Isle of Wight Natural Area Profile*

3. English Nature, 1998. *UK BAP Targets By Natural Area - 10 Terrestrial Habitats*

4. Department of the Environment, 1998, *UK Biodiversity Group Tranche 2 Action Plans. Volume II – terrestrial and freshwater habitats*. Peterborough: English Nature on behalf of the UK Biodiversity Group

5. Isle of Wight Biodiversity Partnership. 2002. Grassland and Grazed Habitats Topic Report. Isle of Wight Council.

6. Joint Nature Conservation Committee, 1999. *The implementation of Common Standards for Monitoring and Conservation Objectives*. Peterborough.

FENS

Latin Name	English_Name	Group	BAP_Status	Rarity	Other habitats
Vertigo moulinsiana	A snail	Mollusc	1	RDB3	REEDBEDS
Anticollix sparsata	Dentated Pug	Moth	3		Broad-leaved mixed woodland
Apamea oblonga	Crescent Striped	Moth	3		♦SALTMARSH
Archanara sparganii	Webb's Wainscot	Moth	3		EUTROPHIC STANDING WATERS
Earias clorana	Cream-bordered Green Pea	Moth	3		
Cephalozia macrostachya	'Pincerwort'	Liverworts	3		
Mylia anomala	'Anomalous Flapwort'	Liverworts	3		LOWLAND HEATHLAND
Pallavicinia lyellii	Ribbonwort	Liverworts	2	VU	WET WOODLAND
Pohlia camptotrachela	'Crookneck Nodding-moss'	Mosses	3		
Berula erecta	Lesser Water-parsnip	Flowering plant	3		MARITIME CLIFFS & SLOPES
Carex curta	White Sedge	Flowering plant	3		
Carex panicea	Carnation Sedge	Flowering plant	3		♦LOWLAND MEADOWS
Carex pseudocyperus	Cyperus sedge	Flowering plant	3		REEDBEDS
Cirsium dissectum	Meadow Thistle	Flowering plant	3		♦LOWLAND MEADOWS
Drosera rotundifolia	Common Sundew	Flowering plant	3		
Eriophorum angustifolium	Common Cottongrass	Flowering plant	3		
Juncus subnodulosus	Blunt-flowered Rush	Flowering plant	3		MARITIME CLIFFS & SLOPES
Menyanthes trifoliata	Bogbean	Flowering plant	3		Fen marsh and swamp
Narthecium ossifragum	Bog Asphodel	Flowering plant	3		

Latin Name	English_Name	Group	BAP_Status	Rarity	Other habitats
Pinguicula lusitanica	Pale Butterwort	Flowering plant	3		
Ranunculus lingua	Greater Spearwort	Flowering plant	3		REEDBEDS

Purple Moor-grass and rush pasture

Latin Name	English Name	Group	BAP_Status	RARITY	Other habitat
Nardus stricta	Mat-grass	Flowering plant	3		♦LOWLAND DRY ACID GRASSLAND

REEDBEDS

Latin Name	English Name	Group	BAP Status	Rarity	Other habitat
Acrocephalus schoenobaenus	Sedge warbler	Bird	2		ANCIENT AND/OR SPP RICH HEDGEROWS
Acrocephalus scirpaceus	Reed warbler	Bird	2		Fen marsh and swamp
Cettia cetti	Cetti's warbler	Bird	2		Fen marsh and swamp
Emberiza schoeniclus	Reed bunting	Bird	1		Fen marsh and swamp
Rallus aquaticus	Water rail	Bird	2		Fen marsh and swamp
Psen atratinus	A solitary wasp	Ants, Bees and Wasps	P3	RDB 2	♦MARITIME CLIFFS & SLOPES
Vertigo moulinsiana	A snail	Mollusc	1	RDB 3	♦FENS
Chilodes maritimus	Silky Wainscot	Moth	3		
Simyra albovenosa	Reed Dagger	Moth	3		
Carex pseudocyperus	Cyperus sedge	Flowering plant	3		♦FENS
Ranunculus lingua	Greater Spearwort	Flowering plant	3		♦FENS

Rivers and streams

Latin Name	English Name	Class	BAP Status	Rarity	Other habitats
Arvicola terrestris	Water vole	Mammal	1		Fen marsh and swamp
Alcedo atthis	Kingfisher	Bird	2		EUTROPHIC STANDING WATERS
Anas platyrhynchos	Mallard	Bird	2		♦EUTROPHIC STANDING WATERS
Motacilla cinerea	Grey wagtail	Bird	2		
Calopteryx virgo	Beautiful Demoiselle	Damselflies and dragonflies	3		♦EUTROPHIC STANDING WATERS
Cordulegaster boltonii	Golden-ringed Dragonfly	Damselflies and dragonflies	3		♦EUTROPHIC STANDING WATERS
Platycemis pennipes	White-legged Damselfly	Damselflies and dragonflies	3		
Sympetrum sanguineum	Ruddy Darter	Damselflies and dragonflies	3		♦EUTROPHIC STANDING WATERS
Southbya nigrella	Green Blackwort	Liverworts	2	EN	♦MARITIME CLIFFS & SLOPES
Cinclidotus fontinaloides	Smaller lattice moss	Mosses	3		
Pohlia lutescens	'Yellow Thread-moss'	Mosses	3		♦Boundary and linear features
Rhynchostegiella curviseta	'Curve-stalked Feather-moss'	Mosses	3		
Groenlandia densa	Opposite-leaved Pondweed	Flowering plant	3		CHALK RIVERS
Lythrum portula	Water Purslane	Flowering plant	3		♦LOWLAND HEATHLAND
Myosotis secunda	Creeping Forget-me-not	Flowering plant	3		

Fen, marsh and swamp

Latin Name	English Name	Group	BAP Status	Rarity	PRIMARY_HABITAT
Arvicola terrestris	Water vole	Mammal	1		♦Rivers & streams
Acrocephalus scirpaceus	Reed warbler	Bird	2		♦REEDBEDS
Cettia cetti	Cetti's warbler	Bird	2		♦REEDBEDS
Cygnus olor	Mute swan	Bird	2		SALTMARSH
Emberiza schoeniclus	Reed bunting	Bird	1		♦REEDBEDS
Gallinago gallinago	Snipe	Bird	2		LOWLAND MEADOWS
Lymnocryptes minimus	Jack snipe (wintering)	Bird	2		LOWLAND MEADOWS
Rallus aquaticus	Water rail	Bird	2		♦REEDBEDS
Equisetum sylvaticum	Wood Horsetail	Fern	3		♦WET WOODLAND
Asilus crabroniformis	A robber fly	Flies	1		♦LOWLAND CALCAREOUS GRASSLAND
Macrosteles fieberi	A leafhopper	True bug	3		♦SALTMARSH
Microvelia pygmaea	A semi-aquatic bug	True bug	3		♦EUTROPHIC STANDING WATERS
Paralimnus phragmitis	A leafhopper	True bug	3		♦SALTMARSH
Riccardia latifrons	'Bog Germanderwort'	Liverworts	3		
Campylopus pyriformis v azorica	'Azorean Swan-neck Moss'	Mosses	3		
Plagiothecium ruthei	'Swamp Silk-moss'	Mosses	3		WET WOODLAND
Thelypteris palustris	Marsh Fern	Fern	3		WET WOODLAND
Baldellia ranunculoides	Lesser Water-plantain	Flowering plant	3		
*Butomus umbellatus**	Flowering Rush	Flowering plant	3		
Cyperus longus	Galingale	Flowering plant	3		EUTROPHIC STANDING WATERS
Eleocharis uniglumis	Slender Spike-rush	Flowering plant	3		EUTROPHIC STANDING WATERS
Gymnadenia conopsea ssp.	Marsh Fragrant Orchid	Flowering plant	3		♦MARITIME CLIFFS & SLOPES

Latin Name	English Name	Group	BAP Status	Rarity	PRIMARY_HABITAT
densiflora					
Isolepis cernua	Slender Club-rush	Flowering plant	3		♦MARITIME CLIFFS & SLOPES
Juncus squarrosus	Heath Rush	Flowering plant	3		♦LOWLAND HEATHLAND
Menyanthes trifoliata	Bogbean	Flowering plant	3		♦FENS
Myrica gale	Bog Myrtle	Flowering plant	3		
Pedicularis sylvatica	Lousewort	Flowering plant	3		♦LOWLAND MEADOWS
Potamogeton polygonifolius	Bog Pondweed	Flowering plant	3		♦EUTROPHIC STANDING WATERS
Rumex hydrolapathum	Water Dock	Flowering plant	3		♦EUTROPHIC STANDING WATERS
Salix repens	Creeping Willow	Flowering plant	3		MARITIME CLIFFS & SLOPES
Triglochin palustre	Marsh Arrowgrass	Flowering plant	3		♦LOWLAND MEADOWS
Valeriana dioica	Marsh Valerian	Flowering plant	3		LOWLAND MEADOWS
Viola palustris	Marsh Violet	Flowering plant	3		WET WOODLAND

Grazing Marsh

Latin Name	English Name	Group	BAP_Status	Rarity	Other habitats
Anas crecca	Teal (wintering)	Bird	2		♦MUDFLATS
Branta bernicla	Brent goose (wintering)	Bird	2		♦SALTMARSH
Alopecurus bulbosus	Bulbous Foxtail	Flowering plant	3		SALTMARSH
Carex divisa	Divided Sedge	Flowering plant	3		♦SALTMARSH
Oenanthe fistulosa	Tubular Water Dropwort	Flowering plant	3		♦EUTROPHIC STANDING WATERS

 1= National BAP Priority Species 2 = Species of National Conservation Concern 3= Species of Local Conservation Concern * introduced species

CHALK RIVERS

LATIN_NAME	ENGLISH_NAME	CLASS	BAP_STATUS	RARITY	PRIMARY_HABITAT
Groenlandia densa	Opposite-leaved Pondweed	Flowering plant	3		♦Rivers & streams