

Isle of Wight Biodiversity Action Plan

Wetlands Habitat Action Plan

Second Review January 2011

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 was reviewed in 2010.

Wetlands have been selected as an action plan habitat for the Isle of Wight to ensure 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 together with the requirements of some key priority BAP species.

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
Reedbeds	Priority	The most extensive reed beds occur in the Eastern and Western Yar valleys with smaller areas frequent along other streams and ditches
Fens (previously lowland fens)	Priority	Local occurrence
Ponds	Priority	Good examples of this habitat are uncommon on the Island
Rivers	Priority	On current understanding we do not believe that we have any rivers that would qualify as priority BAP habitat
Species		
Water Vole	Priority	Strong Island populations in absence of feral mink but some evidence of decline.
Great Crested Newt	Priority	Localised and very restricted extant population

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 occur in association with other important habitats. There are transitions from coastal and floodplain grazing marsh to habitats such as saltmarsh and saline lagoons. These are considered in the Estuaries HAP. They 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. An assessment of the condition of the remaining wetland habitat indicates that many of the remaining wetland sites are in poor condition. This is 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. Ten species are UK BAP priority species and a further 97 species of local conservation concern including Daubenton's bat are also associated with the Island's wetland habitats.

The UK national biodiversity targets were revised in 2006. They cover the period 1998 – 2015. It has proved difficult to translate these to local BAP creation targets. The Island's small scale landscape does not lend itself to large extents of any one habitat type; a mosaic of wetland habitats is more in keeping with the Island's landscape and likely to provide the greatest biodiversity gains. However, this does mean that specialist species that require large extents of habitat are not likely to be well catered for on the Island. For example more than 75% of the reedbeds are less than 2ha in area and there is no history of specialists such as bittern, bearded tit or marsh harrier having established viable populations on the Island.

COASTAL FLOODPLAIN & GRAZING MARSH

England targets (2008) include:

- Achieve favourable or recovering condition of 76,500 ha by 2015
- Maintain the current extent of 170,000 ha
- Restore 7,500 ha by 2015
- Re-establish 1,250 ha by 2015

South-east England targets:

- Maintain the current extent of 32,000 ha floodplain & grazing marsh
- Restore and re-establish 1,900 ha by 2026

Isle of Wight targets (2010):

- Maintain the current extent and improve the condition of approximately 558 ha of floodplain & grazing marsh

REEDBEDS

England targets (2008) include:

- Achieve favourable or recovering condition of 4,680 ha (90%) by 2015
- Maintain the current extent of 5,200 ha
- Re-establish 1,900 ha by 2015

South-east England targets:

- Maintain the current extent of 700 ha
- Restore and re-establish 1,900 ha of reedbeds & fens (combined) by 2026

Isle of Wight targets (2010):

- Maintain the current extent and improve the condition of approximately 152ha reedbeds
- Create 20ha of additional reedbed habitat (RSPB target on their reserve)

FENS

England targets (2008) include:

- Achieve favourable or recovering condition of 7,200 ha (90%) by 2015
- Maintain the current extent of 8,000 ha
- Initiate the restoration of 1,500 ha by 2015

South-east England targets:

- Maintain 200 fen sites
- Restore and re-establish 1,900 ha of reedbeds & fens (combined) by 2026

Isle of Wight targets (2010):

- Maintain the current extent and improve the condition of approximately 87 ha of fen habitat

PONDS

England targets (2008) include:

- Achieve favourable condition of 2015 flagship ponds
- Maintain the net number of 4,300 high quality pond sites
- Create 7,950 new ponds of high quality potential

South-east England targets for Ponds have not yet been set.

However, twelve Important Areas for Ponds (IAPs) have been identified within the Environment Agency's Southern Region. None of these were selected from the Isle of Wight.

Isle of Wight targets (2010) Ponds have not been mapped and no targets have been set

RIVERS – National targets have yet to be set

WATER VOLE

England targets (2006) are:

- Maintain the current range of 582 occupied 10km squares
- Increase the range by 52 10km squares by 2015

South-east England targets for Water Vole have not been set

Isle of Wight targets (2010) are:

- Maintain the current extent of the population within each of the catchments where they are recorded and improve the habitat to link up fragmented populations (Currently recorded from 7x10km squares).

GREAT CRESTED NEWT

England targets (2006) include:

- Increase the range by 37 10km squares by 2015
- Increase the number of occupied ponds from 88,000 to 123,200 by 2015
- Increase the number of ponds with a habitat suitability index of >0.7 from 52,800 to 73,920 by 2015

South-east England targets for Great Crested Newt have not been set. However, Important Areas for Ponds (IAPs) have been identified within the Environment Agency Southern Region and these include a large Wealden Great Crested Newt IAP.

Isle of Wight targets (2010) are:

- Maintain the current extent of the population and maintain and restore the habitat so as to maintain viable populations (currently recorded from 4x10km squares)

2 Current Status

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.

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 assessment¹ estimated that this habitat covered some 561 hectares. The dataset was revised in 2010 for the national inventory and the most recent estimate is 558 ha. 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.

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

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.

² Common Standards Monitoring Guidance for Lowland Wetland Habitats. August 2004. JNCC

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 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 reed bed. Other small examples of rich fen occur along spring lines flushes 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).

For the purposes of constructing a national inventory of wetland habitats, Natural England has produced guidelines for mapping lowland fen habitat following JNCC guidance². Natural England's habitat definition statement v1.3 states that 'Reedbeds are a component/subset of Fens and may be mapped in both inventories. Small areas of reed may be included in parcels of fen, but larger areas of reedbeds should be mapped in the Fen inventory as reedbed 'to allow the reedbed constituent of the fen inventory to be separated out'.

NVC communities mapped under the broad lowland fen category are: M1-M14, M19-M21, M27-M38; M22 and M24 in soligenous fens; and all S communities apart from S4 and S26. Under this wider definition, wetland habitats that fall within this category include areas of tall eutrophic fen and single species swamps such as greater pond-sedge *Carex riparia*, reed canary grass *Phalaris arundinacea* or in brackish situations sea club-rush *Bolboschoenus maritimus*. Using this definition the Island has approximately 89 ha of habitat mapped which is either 'definitely the habitat' or 'habitat is present within the area'. 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.

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. The total area mapped is 151 ha but only about 25% is in blocks greater in area than 2 ha. 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.

Ponds

Ponds are an important freshwater habitat and play a key role in maintaining biodiversity at the landscape level. However, they are vulnerable to environmental degradation and there is evidence that, at a national level, pond quality is declining. The pond resource on the Island is inadequately known but includes farm ponds, transitory ponds developed on actively slumping ground and garden ponds. This Plan considers the more natural ponds. Garden ponds can be important in

sustaining populations of some key species, such as amphibians, but their management and survival are not linked to countryside land management.

The Environment Agency has commissioned a report (2009) with Pond Conservation, to identify Important Areas for Ponds (IAPs) in the Southern Region according to national criteria and using available data. They identified 12 areas for IAP status and additionally one great crested newt IAP. Ponds on the Island failed to meet the recognised criteria based upon available data.

The principle of IAPs would seem to be appropriate to adopt for the Island but these areas would be proposed at a county level rather than a regional or national level. The criteria relevant to the Island would be

- Criterion 2 *Species of high conservation importance.*
- Criterion 3 *Exceptionally assemblages of key biotic groups at a county level*
- Criterion 4 *Ponds of high ecological quality*

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 Fattingspark 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.

Wetland Species

The Island's wetlands are home to a rich diversity of plant and animal species including ten species that have been identified as priority species within the UK BAP. Water vole *Arvicola terrestris*, Brent goose *Branta bernicla*, Reed bunting *Emberiza schoeniclus*, great crested newt *Triturus cristatus*, European eel *Anguilla Anguilla*, hornet robber fly *Asilus crabroniformis*, Desmoulin's whorl snail *Vertigo moulinsiana*, pillwort *Pilularia globulifera*, divided sedge *Carex divisa*, tubular water dropwort *Oenanthe fistulosa*

Water voles (*Arvicola terrestris*) are 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. Daubenton's bats (*Myotis daubentonii*) are also associated with wetland corridors.

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 Island's 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** (*Emberiza schoeniculus*). 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.

Limited numbers of **Brown/Sea trout** (*Salmo trutta*) and **eel** (*Anguilla anguilla*) have been recorded in the Island's rivers following electric fishing surveys undertaken by the Environment Agency.

Great Crested Newt (*Triturus cristatus*) is believed to be an uncommon and highly localised species on the Island with a small number of metapopulations

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

Wetland habitat types	Area
Reed bed	152 ha
Fens	89 ha
Marshy grassland	73 ha
Wet heathland	0.4 ha
Wet woodland	180 ha
Coastal and flood plain grazing marsh	558 ha
Total	1050.4 ha

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 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 (ha) within main SSSI

Site Name	Coastal & Floodplain Grazing marsh	Marshy Grassland	Reedbed	Fen	Wet Woodland
Cridmore Bog				11	
The Wilderness				4.6	7.8
Kings Quay Shore			1.6		2.7
Ryde Sands	5.6		2.7		
Freshwater Marsh			13	0.5	2.8
Brading Marshes	190*	17.4	24.8		
Alverstone Marshes		0.8	7	9	11
Medina Estuary			1.9	2.7	1

Thorness Bay			9.7		
Yar Estuary	30		35		2
Total	225.6	18.2	95.7	27.8	27.3

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

Table 4: Distribution and condition of wetland SINC's

Name	Code	SINC criteria				Area ha	Management	Other habitats
		5a	5b	6a	6c			
Thorley Meadows	C008A		Y			12.19		
Lee Copse	C012A	Y				16.48	WGS	Woodland, grassland, heathland
Bouldnor Copse	C013A	Y				80.73	FDP	Woodland, grassland
Caul Bourne	C034A	Y				0.66	ELS/Residents plan	
Sudmoor Dyke	C037A	Y				5.42	HLS	
Sudmoor Dyke	C037B	Y				6.89	HLS	
Sudmoor Dyke	C037C	Y				2.03	HLS	
Sudmoor Dyke	C037D	Y				3.27	ELS	
Thorley Copse	C063A		Y			9.49	ELS	Woodland
Parkhurst Forest	C070E		Y			195.23	FDP	Woodland, grassland, heathland
Plaish Meadows	C072A	Y	Y			9.35	Advice	Grassland
Wolverton Marsh	C085A	Y	Y			11.12	WGS/CSS	Woodland
Wydcombe Estate	C096A		Y			30.74	WGS/ELS/Survey	Woodland, grassland
Upper Dolcoppice	C097A		Y			15.41	survey	Woodland, grassland
Appuldurcombe Down:Godshill Park	C102B	Y				28.19	ELS	Woodland
Bleak Down	C105A	Y				4.91	HLS	Heathland
Upper Yar Valley:Scotland Farm	C106A	Y	Y			14.68	Survey	Woodland
Upper Yar Valley:Roud	C106B		Y			4.45		
Bottom's Copse, Godshill	C108A		Y			4.04		Woodland
Great Budbridge	C113A		Y			15.22	HLS/CSS	Woodland
Great Budbridge:Kennerley Heath	C113B		Y			15.90	Survey	
Great Budbridge:Munsley Bog	C113C		Y			8.77	Y	Woodland
Moor Farm	C114A		Y			12.50	HLS	
Redway Farm	C115A	Y	Y			12.05	Advice	Woodland
Gatcombe Witherbed	C119A		Y			41.45	WGS	Woodland
River Medina:Shide Blackwater	C121A		Y			6.87	HLS	Woodland
Standen Heath	C125A		Y			5.72		Woodland
Lynch Copse	C149A		Y			8.69	WGS	Woodland
Newchurch Marshes NW	C151A		Y			7.79	ELS	
Newchurch Marshes NE	C151B		Y			4.51	CSS	Woodland
Newchurch Marshes SW	C151C		Y			8.83	CSS	
Youngwoods Copse:Brett's Meadow	C155A		Y			6.54		Woodland, grassland
Alverstone Marshes East	C156B	Y				1.97	Advice	Woodland

Alverstone Mead	C156C	Y	Y			45.71	CSS	Woodland
Moon's Hill	C162A		Y			3.70		Grassland
Nettlestone Marsh	C170A		Y			7.20		Grassland
Compton Grange	C184A	Y	Y			5.27	CSS	
Shalfleet Churchyard	C192A	Y				0.67		Grassland
Buddle Brook	C193A	Y				5.06		Woodland
Stag Lane Pond	C198A	Y				0.35		
Carisbrooke Castle:Kent's Mill	C203A	Y				2.23	Advice	Woodland
Carisbrooke Waterworks Pond	C204A	Y				0.61	Y	
River Medina:Shide	C205A	Y	Y			1.96	Y	Woodland
Lukely Brook:south	C206A	Y				0.84	NI	Woodland
Lukely Brook:north	C206B	Y				0.59	NI	Woodland
Bohemia Bog	C207A		Y			3.37	Y	
Marshcombe Copse	C228A		Y			6.19	WGS/HLS	Woodland
Morton Marsh	C229A	Y	Y			6.84		
Perreton Down and Marsh	C250B		Y			11.92	ELS	Woodland, grassland
Barton Withybed	C255A		Y			8.83		Woodland
Ninham Withybed	C255B		Y			12.04		Woodland
Landguard Manor Farm Meadow	C257B		Y			1.00		Grassland
Sandown Golf Course	C261A	Y	Y			35.29		Woodland, grassland, heathland
Sandown Golf Course:Scotchell's Brook	C261B	Y	Y			8.78		Woodland
Sandown Levels	C262A		Y			17.88	Advice	
Pope's Farm Marsh	C263A		Y			2.07	CSS	
Brading Marshes North	C265A	Y	Y			32.74		
Wroxall Meadow South	C277A	Y				1.04		Grassland
Kitbridge Meadows	C279A			Y	Y	52.33	Y	Grassland
Padmore Fields, Whippingham	C280A	Y				4.42		Woodland, grassland
High Grange Marsh	C288A		Y			0.64		

SINC Criteria

5a Areas of open freshwater (e.g. lakes, ponds, rivers, streams, ditches) which support a significant assemblage of aquatic flora and fauna

5b Reed swamps, fens, flushes, seepages, springs inundation grasslands etc that support a significant assemblage of flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions

6a Any site which supports a viable population of one or more species protected under the Habitats Regulations or listed in schedules 1, 5 or 8 of the Wildlife and Countryside Act 1981 (as revised and amended) or in Red Data books of Britain and Ireland

6c Any site that supports a significant proportion of the Island population or contributes significantly to the range on the Island of a national BAP priority species or a local BAP species which could be at risk because of very small populations, recent rapid decline or habitat loss or change,

Management: ELS Entry Level Stewardship; HLS Higher Level Stewardship; CSS Countryside Stewardship; WGS Woodland Grant Scheme; Y management plan; Advice: given within 5 years: Survey within 5 years; NI Non-intervention site

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 (*Potentilla palustris*) forming a fen vegetation type described by the National Vegetation Classification (NVC) as *Carex rostrata* – *Potentilla 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 SSSIs, 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 where these two species occur.

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 some 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 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.

Farmland on MOD land on the eastern banks of the Newtown Estuary has the largest surviving collection of unmodified field ponds. They support the most important metapopulation of great crested newts on the Island and a number of nationally and locally scarce macrophytes. Farm ponds at Kitbridge, alongside the Gunville Stream, Newport, support the second most important Island great crested newt metapopulation.

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 through ancient woodlands in the north-east of the Island such as the Palmer's Brook and Blackbridge Brook.

3 Current Factors affecting the habitat

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 and increased sediment load as a result of erosion of the banks. 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.

Water quality

Rivers of the Isle of Wight are regularly monitored by the Environment Agency to look at trends in chemical and biological quality, assess compliance with environmental legislation and plan improvement work as required. The implementation of the European Water Framework Directive (WFD) in 2003 has changed the way the Environment Agency monitors water bodies. The principal objective of the Directive is "to achieve good status in all waters by 2015 and to ensure that status does not deteriorate in any waters". To accomplish this, the Directive has introduced a more structured and integrated approach. Statutory standards are set for both biological and chemical parameters, alongside assessments of flow and physical modification. Monitoring estuaries, coastal waters, and lakes has continued but in a more routine and balanced way than previously.

Water quality is reduced by nutrient enrichment, the main sources of which are from treated sewage effluent and agricultural activities. There is a need for better understanding of the effects of nutrients in the water environment and how different chemical states of a nutrient interact. For example: the balance between different forms of phosphate and how river conditions impact on these.

The past two decades have seen improvements in water quality on the Isle of Wight. A major improvement scheme to waste water treatment works has diverted the majority of sewage effluent on the Island to Sandown for treatment prior to discharge via a long outfall into the Solent. This has significantly improved the quality of the Solent along the north coast of the Island, and the improvement works have now been extended to the River Medina since flows from Fairlee Waste Water Treatment Works (WWTW) have also been diverted to Sandown WWTW from 2010

A number of the larger WWTW and some of the smaller ones have been targeted with higher treatment to reduce the level of nutrients discharged. These have been progressed to protect particularly sensitive waters such as designations under the Habitats Directive and the Sensitive Area (Eutrophic) designations of the Urban Waste Water Treatment Directive. The WFD will also make the requirement for lower nutrient levels more widespread than previously, where there is evidence of ecological damage.

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 from 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. The Environment

Agency has been involved in the Government's Catchment Sensitive Farming initiative. Again, further work under the WFD will be required in relevant catchments.

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 rivers can be 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.

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 directed 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, 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 have not been properly investigated. A network of boreholes has been installed throughout the lower greensand in the Medina Valley to augment flows in the Eastern Yar for abstraction at Burnt House. The data from monitoring boreholes have not shown any impact upon wetland habitats in this part of the Island but 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. There are current proposals (2010) to phase in licence requirements for trickle irrigation.

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.

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.

Sea level rise

Sea level rise predictions calculate that there could be up to 50cm rise 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.

Fisheries

The Environment Agency has carried out a series of surveys of Island fish populations between 1980 and 2007 and made an assessment of fish passage issues on the Medina in 2009. Some rivers and streams are known to support fish populations of nature conservation importance such as the bullhead and brook lamprey. Others 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. 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

Site and Species Protection

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 under the CROW Act 2000. Despite fragmentation of the remaining wetland habitat resulting from land drainage, agricultural intensification and landfill operations, the site still contains the features for which it was originally notified.

Identification of Sites of Importance for Nature Conservation is ongoing on the Island. The most recent SINCs to be proposed which have wetland features are Kitbridge Meadows, Padmore Farm Fields and High Grange Marsh. Further wetland SINCs may be identified by the IW Council.

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.

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 high value wetland habitats.

Wetlands are a target habitat for High Level Stewardship (HLS), administered by DEFRA through Natural England. 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 by the Wildlife Trust 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.

The RSPB have purchased most of Brading Marshes SSSI and adjoining flood plain land and are undertaking extensive habitat management and water level control to restore and enhance wetland habitats within the marshes.

The Eastern Yar Fluvial and Coastal Strategy 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.

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.

A repeat survey of water vole populations on the Island, carried out in 2008, updating information from previous surveys, have been carried out by the Wildlife Trust with funding from EA.

Natural England 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.

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.

The water vole is a particularly important National BAP priority species for the Island, in the absence of mink and otter. The Isle of Wight has always been a stronghold for water voles, and the 2008 survey has shown that although the number of watercourses exhibiting water voles remains the same, overall the number of survey sections with water vole activity has decreased compared with all previous full surveys. If this continuing trend persists, further isolated communities of water voles will become prevalent, and more and more localised extinctions are likely to occur. Appropriate bank side management is particularly important to sustain water vole populations and allow them to spread. Flood plain areas where water courses regularly overtop their banks, such as in the lower reaches of the Eastern Yar, are unlikely to sustain core populations of water voles.

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.

The objectives of the Water Framework directive are

- Preventing deterioration in the status of water bodies.
- Aim to achieve "good" ecological status and good surface water chemical status in water bodies by 2015.
- Achieve good ecological potential for waterbodies that are designated as artificial or heavily modified by fulfilling all mitigation measures

5 Targets and Actions

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.

Biodiversity Targets for Wetland Habitats on the Isle of Wight

- A** Maintain existing area of wetlands habitat for its wildlife and earth science interest with no net loss, subject to natural change.
- B** Enhance and restore degraded or neglected areas of wetlands into habitat and/or exposures of high wildlife and earth science value
- C** Establish buffer zone habitats between intensively-managed agricultural land and wetlands
- D** Improve the knowledge of wetlands resource by survey, research and monitoring
- E** Increase public awareness and appreciation of wetlands resulting in a more positive management of this habitat

	Biodiversity Actions for Wetlands on the Isle of Wight	Lead	Reporting	2011	2012	2013	2014	2015	2020
A1	Maintain the current extent of wetland habitats (as mapped by GIS 2010) by 2015	All	IWC					⇨	
A2	Ensure appropriate management and water level control to achieve favourable or recovering condition or recovering condition of 85% of all wetland habitats within designated sites by 2015	All	IWC					⇨	
A3	Maintain the current extent of the population of water voles within each of the catchments where they are recorded and improve the habitat to link up fragmented populations, as demonstrated by quinquennial Isle of Wight water vole surveys	EA	EA			⇨			◆
A4	Maintain the current extent of the population of great crested newts and maintain and restore the habitat so as to maintain viable populations	All	IWC						⇨
B1	Increase the area of reed swamp on Brading Marshes from 11ha to >30ha by 2020	RSPB	IWC						◆
B2	Promote wetland habitat continuity by restoring degraded wetland habitats on 10 sites by 2015	All	IWC					◆	
B3	Ensure consented abstraction licences do not compromise river catchment functionality. This will be implemented through the	EA	EA			⇨			◆

	EA Restoring Sustainable Abstraction (RSA) Programme																			
B4	Create 25 new ponds in vicinity of existing pond complexes by 2013	H&IWWT	IWC																	
B5	Carry out improvements to sites where eel migration issues have been identified. Priority will be given to structures on the River Medina & Eastern Yar	EA	EA																	
B6	Actively contribute to improving rivers and wetlands, aiming to achieve good status under the Water Framework Directive.	All	EA																	
B7	Through the Environment Agency's Better Rivers Programme, seek to restore one third of the Island's degraded rivers by 020 under the SE River Basin Management Plan	EA	EA																	
C1	Reduce the effects of agricultural run-off through the Catchment Sensitive Farming initiative by 2013	EA/H&IWWT	EA/HIWWT																	
C2	Report on length of farmland buffers of water courses created through the Catchment Sensitive Farming Initiative	HIWWT																		
C3	Explore opportunities to create large scale flood plain restoration to cater for integrated approaches to land management	EA	IWC																	
D1	Identify locally important pond areas using evidence base and modelling tools	HIWWT	IWC																	
D2	Assess effectiveness of River Medina eel passes	EA	EA																	
D3	Monitor fisheries populations on E. Yar (2 sites) as part of the National Fisheries Monitoring programme	EA	EA																	
D4	Ensure systematic collection and collation of existing and new data on non native plant species. Promote active control where appropriate	All	EA/IWC																	
E1	Seek opportunities to increase public awareness and appreciation of wetlands by participating in events such as Riverfest	All	NEnt																	

◆ Complete by ⇨ Ongoing → start by

KEY TO ORGANISATIONS

AONB	Isle of Wight Area of Outstanding Natural Beauty Unit	IWC (Planning)	Isle of Wight Council Planning Services
H&IWWT	Hampshire & Isle of Wight Wildlife Trust	IWNHAS	Isle of Wight Natural History and Archaeological Society
IWC (Coastal)	Isle of Wight Council Centre for the Coastal Environment	NE	Natural England
IWC	Isle of Wight Council	NT	National Trust
NEnt	Natural Enterprise		

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Species associated with wetland habitats

Latin	English	BAP	Primary habitat	Subsidiary habitat	Abundance	Local population trend
Mammals						
<i>Arvicola terrestris</i>	Water vole	1	Rivers	Fen, marsh and swamp	Localised	Decreasing
<i>Myotis daubentonii</i>	Daubenton's Bat	3	Mosaic	Rivers	Localised	Unknown
Birds						
<i>Acrocephalus schoenobaenus</i>	Sedge warbler	3	Reedbeds	Fen, marsh and swamp	Localised (bird)	Decreasing
<i>Acrocephalus scirpaceus</i>	Reed warbler	3	Reedbeds	Fen, marsh and swamp	Common	Stable
<i>Alcedo atthis</i>	Kingfisher	3	Rivers	Eutrophic standing waters	Scarce	Stable
<i>Anas strepera</i>	Gadwall (wintering)	3	Eutrophic standing waters	Intertidal mudflats	Localised	Stable
<i>Aythya ferina</i>	Pochard	3	Eutrophic standing waters	Coastal waters	Localised (bird)	Decreasing
<i>Branta bernicla</i>	Brent goose (wintering)	1	Saltmarsh	Grazing marsh	Common	Increasing
<i>Cettia cetti</i>	Cetti's warbler	3	Reedbeds	Fen, marsh and swamp	Scarce	Increasing
<i>Emberiza schoeniclus</i>	Reed bunting	1	Reedbeds	Fen, marsh and swamp	Localised (bird)	Stable
<i>Lymnocyptes minimus</i>	Jack snipe (wintering)	3	Fen, marsh and swamp	Lowland meadows	Localised (bird)	Stable
<i>Rallus aquaticus</i>	Water rail	3	Reedbeds	Fen, marsh and swamp	Localised (bird)	Stable
Amphibians						
<i>Bufo bufo</i>	Common Toad	3	Eutrophic standing waters	Built-up areas & gardens	Localised	Stable
<i>Rana temporaria</i>	Common Frog	3	Eutrophic standing waters	Built-up areas & gardens	Localised	Stable
<i>Triturus cristatus</i>	Great Crested Newt	1	Mosaic	Eutrophic standing waters	Localised	Unknown
Fish						
<i>Anguilla anguilla</i>	European Eel	1	Eutrophic standing waters	Seas	Common	Stable
<i>Cottus gobio</i>	Bullhead	3	Rivers		Occasional	Stable
<i>Lampetra planeri</i>	Brook Lamprey	3	Rivers		Scarce	Unknown
Ants bees and wasps						
<i>Mimumesa atratina</i>	A solitary wasp	3	Maritime cliffs & slopes	Reedbeds	Rare	Unknown
<i>Mimumesa unicolor</i>	A solitary wasp	3	Maritime cliffs & slopes	Reedbeds	Localised	Stable
Dragonflies and damselflies						
<i>Brachytron pratense</i>	Hairy Dragonfly	3	Eutrophic standing waters		Scarce	Increasing
<i>Calopteryx virgo</i>	Beautiful Demoiselle	3	Rivers		Localised	Stable
<i>Cordulegaster boltonii</i>	Golden-ringed Dragonfly	3	Rivers		Occasional	Unknown
<i>Erythromma najas</i>	Red-eyed Damselfly	3	Eutrophic standing waters		Scarce	Increasing
<i>Lestes sponsa</i>	Emerald Damselfly	3	Eutrophic standing waters		Scarce	Stable
<i>Libellula depressa</i>	Broad-bodied Chaser	3	Eutrophic standing waters		Localised	Unknown

<i>Libellula quadrimaculata</i>	Four-spotted Chaser	3	Eutrophic standing waters		Rare	Unknown
Flies						
<i>Asilus crabroniformis</i>	A robber fly	1	Lowland calcareous grassland	Fen, marsh and swamp	Occasional	Unknown
Molluscs						
<i>Vertigo moulinsiana</i>	A snail	1	Fen, marsh and swamp	Reedbeds	Rare	Unknown
Moths						
<i>Apamea oblonga</i>	Crescent Striped	3	Saltmarsh	Fens	Rare	Unknown
<i>Archanara sparganii</i>	Webb's Wainscot	3	Fen, marsh and swamp	Eutrophic standing waters	Occasional	Unknown
<i>Chilodes maritimus</i>	Silky Wainscot	3	Reedbeds		Occasional	Unknown
<i>Earias clorana</i>	Cream-bordered Green Pea	3	Fen, marsh and swamp	Maritime cliffs & slopes	Localised	Unknown
<i>Hypenodes humidalis</i>	Marsh Oblique-barred	3	Fen, marsh and swamp		Rare	Unknown
<i>Simyra albovenosa</i>	Reed Dagger	3	Reedbeds		Rare	Unknown
True bugs						
<i>Macrosteles fieberi</i>	A leafhopper	3	Saltmarsh	Fen, marsh and swamp	Rare	Unknown
<i>Microvelia pygmaea</i>	A semi-aquatic bug	3	Eutrophic standing waters	Fen, marsh and swamp	Rare	Unknown
<i>Paralimnus phragmitis</i>	A leafhopper	3	Saltmarsh	Fen, marsh and swamp	Rare	Unknown
Liverworts						
<i>Cephalozia macrostachya</i>	'Pincerwort'	3	Fens		Rare	Decreasing
<i>Cladopodiella fluitans</i>	'Bog Notchwort'	3	Fens		Believed extinct	
<i>Mylia anomala</i>	'Anomalous Flapwort'	3	Fens	Lowland heathland	Believed extinct	
<i>Riccardia latifrons</i>	'Bog Germanderwort'	3	Fens		Rare	Decreasing
<i>Riccia fluitans</i>	Floating Crystalwort	3	Eutrophic standing waters		Rare	Decreasing
Mosses						
<i>Campylopus pyriformis</i> var. <i>azoricus</i>	'Azorean Swan-neck Moss'	3	Fens	Fen, marsh and swamp	Believed extinct	
<i>Cinclidotus fontinaloides</i>	Smaller lattice moss	3	Rivers		Rare	Unknown
<i>Drepanocladus aduncus</i>	"Kneiff's Hook-moss'	3	Eutrophic standing waters	Coastal sand dunes	Rare	Unknown
<i>Plagiothecium ruthei</i>	'Swamp Silk-moss'	3	Wet woodland	Fen, marsh and swamp	Rare	Decreasing
<i>Pleurozium schreberi</i>	'Red-stemmed Feather-moss'	3	Lowland heathland	Fen, marsh and swamp	Rare	Decreasing
<i>Pohlia campotrichela</i>	'Crookneck Nodding-moss'	3	Fens		Believed extinct	
<i>Rhynchostegiella curviseta</i>	'Curve-stalked Feather-moss'	3	Rivers		Scarce	Unknown
<i>Sphagnum capillifolium</i>	'Red bog moss'	3	Fens		Rare	Decreasing
<i>Sphagnum cuspidatum</i>	'Feathery bog moss'	3	Fens		Rare	Decreasing
<i>Sphagnum fallax</i>	'Flat-topped bog moss'	3	Fens		Rare	Decreasing
<i>Sphagnum papillosum</i>	'Papillose bog moss'	3	Fens		Rare	Decreasing
Ferns						
<i>Equisetum sylvaticum</i>	Wood Horsetail	3	Wet woodland	Fen, marsh and swamp	Rare	Unknown
<i>Oreopteris limbosperma</i>	Lemon-scented Fern	3	Wet woodland	Fen, marsh and swamp	Rare	Unknown
<i>Pilularia globulifera</i>	Pillwort	1	Eutrophic standing	Fen, marsh and swamp	Rare	Decreasing

			waters			
<i>Thelypteris palustris</i>	Marsh Fern	3	Wet woodland	Fen, marsh and swamp	Rare	Decreasing
Flowering plants						
<i>Alopecurus aequalis</i>	Orange Foxtail	3	Fen, marsh and swamp		Rare	Unknown
<i>Alopecurus bulbosus</i>	Bulbous Foxtail	3	Grazing marsh	Saltmarsh	Scarce	Stable
<i>Apium inundatum</i>	Lesser Marshwort	3	Eutrophic standing waters	Fen, marsh and swamp	Rare	Unknown
<i>Baldellia ranunculoides</i>	Lesser Water-plantain	3	Fen, marsh and swamp	Eutrophic standing waters	Rare	Unknown
<i>Berula erecta</i>	Lesser Water-parsnip	3	Fens	Maritimr cliff & slopes	Rare	Unknown
<i>Carex curta</i>	White Sedge	3	Fens		Rare	Decreasing
<i>Carex divisa</i>	Divided Sedge	1	Saltmarsh	Grazing marsh	Occasional	Stable
<i>Carex pseudocyperus</i>	Cyperus sedge	3	Fens	Reedbeds	Rare	Unknown
<i>Carex rostrata</i>	Bottle Sedge	3	Fen, marsh and swamp		Rare	Decreasing
<i>Carex viridula subsp. brachyrrhyncha</i>	Long-stalked Yellow Sedge	3	Fens		Rare	Unknown
<i>Cirsium dissectum</i>	Meadow Thistle	3	Lowland meadows	Fens	Rare	Decreasing
<i>Cyperus longus</i>	Galingale	3	Fen, marsh and swamp	Eutrophic standing waters	Believed extinct	
<i>Drosera rotundifolia</i>	Common Sundew	3	Fens		Rare	Decreasing
<i>Eleocharis multicaulis</i>	Many-stalked Spike-rush	3	Fens		Rare	Unknown
<i>Eleocharis uniglumis</i>	Slender Spike-rush	3	Fen, marsh and swamp	Eutrophic standing waters	Rare	Unknown
<i>Eleogiton fluitans</i>	Floating Club-rush	3	Eutrophic standing waters		Rare	Decreasing
<i>Erica tetralix</i>	Cross-leaved Heath	3	Lowland heathland	Fen, marsh and swamp	Rare	Decreasing
<i>Eriophorum angustifolium</i>	Common Cottongrass	3	Fens		Rare	Decreasing
<i>Genista anglica</i>	Petty Whin	3	Lowland heathland	Fens	Believed extinct	
<i>Glyceria declinata</i>	Small Sweet-grass	3	Fen, marsh and swamp		Rare	Unknown
<i>Glyceria notata</i>	Plicate Sweet-grass	3	Fen, marsh and swamp		Rare	Unknown
<i>Groenlandia densa</i>	Opposite-leaved Pondweed	3	Rivers		Rare	Unknown
<i>Gymnadenia conopsea subsp. densiflora</i>	Marsh Fragrant Orchid	3	Maritime cliffs & slopes	Fen, marsh and swamp	Rare	Decreasing
<i>Hippuris vulgaris</i>	Marestail	3	Eutrophic standing waters		Rare	Decreasing
<i>Isolepis cernua</i>	Slender Club-rush	3	Maritimr cliff & slopes	Fen, marsh and swamp	Rare	Unknown
<i>Juncus squarrosus</i>	Heath Rush	3	Lowland heathland	Fen, marsh and swamp	Believed extinct	
<i>Juncus subnodulosus</i>	Blunt-flowered Rush	3	Fens	Maritime cliffs & slopes	Rare	Unknown
<i>Lemna gibba</i>	Fat Duckweed	3	Eutrophic standing waters		Rare	Decreasing
<i>Lotus angustissimus</i>	Slender Birdsfoot Trefoil	3	Lowland dry acid grassland	Grazing marsh	Rare	Unknown
<i>Lythrum portula</i>	Water Purslane	3	Lowland heathland	Rivers	Scarce	Decreasing
<i>Menyanthes trifoliata</i>	Bogbean	3	Fens	Fen, marsh and swamp	Scarce	Decreasing
<i>Myosotis secunda</i>	Creeping Forgetmenot	3	Rivers		Rare	Unknown
<i>Myrica gale</i>	Bog Myrtle	3	Wet woodland	Fen, marsh and swamp	Rare	Decreasing
<i>Myriophyllum alterniflorum</i>	Alternate Water Milfoil	3	Eutrophic standing waters		Rare	Unknown
<i>Nardus stricta</i>	Mat-grass	3	Lowland dry acid grassland	<i>Purple moorgrass & rush pasture</i>	Rare	Unknown
<i>Narthecium ossifragum</i>	Bog Asphodel	3	Fens		Rare	Decreasing
<i>Oenanthe fistulosa</i>	Tubular Water Dropwort	1	Eutrophic standing waters	Grazing marsh	Rare	Decreasing
<i>Pinguicula lusitanica</i>	Pale Butterwort	3	Fens		Rare	Unknown
<i>Populus nigra subsp. betulifolia</i>	Black Poplar (native)	3	Rivers	Maritime cliffs & slopes	Rare	Stable

<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed	3	Eutrophic standing waters		Rare	Unknown
<i>Potamogeton polygonifolius</i>	Bog Pondweed	3	Eutrophic standing waters	Fen, marsh and swamp	Scarce	Decreasing
<i>Ranunculus baudotii</i>	Brackish Water-crowfoot	3	Fen, marsh and swamp		Localised	Unknown
<i>Ranunculus lingua</i>	Greater Spearwort	3	Fens	Reedbeds	Rare	Decreasing
<i>Rumex hydrolapathum</i>	Water Dock	3	Eutrophic standing waters	Fen, marsh and swamp	Scarce	Unknown
<i>Salix repens</i>	Creeping Willow	3	Fen, marsh and swamp	Maritime cliffs & slopes	Rare	Decreasing
<i>Spirodela polyrhiza</i>	Greater Duckweed	3	Eutrophic standing waters		Rare	Decreasing
<i>Triglochin palustre</i>	Marsh Arrowgrass	3	Fen, marsh and swamp	Lowland meadows	Scarce	Decreasing
<i>Valeriana dioica</i>	Marsh Valerian	3	Fen, marsh and swamp	Lowland meadows	Rare	Decreasing
<i>Viola palustris</i>	Marsh Violet	3	Fen, marsh and swamp	Wet woodland	Scarce	Decreasing

1 = National BAP Priority Species

3 = Local BAP Priority species

Habitats = National BAP Priority Habitats