



East of England Biodiversity Audit

A report for East of England Biodiversity Forum

Funded by English Nature, Environment Agency, Forestry Commission and RSPB



Produced by East of England Wildlife Trust Consultancies

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Table 1 : Consultees for document

Consultee	Organisation	Consultee	Organisation
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Executive summary

Summary of work contained within audit

Numbers of habitat and species action plans considered

There were six Local Biodiversity Action Plans (LBAPs) in the region containing 446 individual species and habitat action plans either being implemented or in preparation. Many action plans were common to two or more counties. Taking these into account, there were action plans for a total of 249 different species and habitats within the East of England.

Of these action plans, further details of 114 are contained within this document and its appendices. Of the other 135 not considered further, 35 were for species identified as being of 'local significance' with no national action plan, 12 were for 'broad' habitats and the remainder (primarily in Norfolk) had been considered for potential action plans during county audits but not pursued to full plans.

The audit identified only one habitat, *Purple moor-grass and rush pasture*, that had been identified within the Regional Environment Strategy as of significance within the region, but had not been identified locally in any of the six counties as requiring a BAP.

Success on search for available information

The information sources used for LBAPs are often surprisingly sparse and many of the LBAPs tend to rely on national datasets for the interpretation of county declines.

Where datasets are available at a regional level for some habitats and species it is often difficult to break these down further to a county level. The nationally-collected datasets (e.g. many woodland types), where available at a county level, are often for broad habitat types rather than the biodiversity habitats required by this document.

Where some data are available at a county level this often remains partial and although minimum estimates are often possible, the total habitat areas or species population sizes frequently remain unknown within counties and hence the region. Estimates of percentages of total national areas or populations held within the region seem to be somewhat easier to judge and are more frequent.

Historical datasets are often poorer and in many cases any declines in numbers or areas of species can only be estimated by extrapolating from the national situation.

Biodiversity Action Planning in the East of England

County Biodiversity Action Planning within the East of England

The six counties within the East of England have written local action plans for 22 of the national priority habitats and 91 of the national priority species.

The distribution of action plans within the East of England between the six counties are given in the three tables below for species, habitats and for completeness, broad habitats as well, although these have not been considered further in the audit.

Table 2: Species action plans by county (total 90 items)

Group	BAP Name	Common Name							Counties with Action Plan in East of England
			Bedfordshire	Cambridgeshire	Essex	Hertfordshire	Norfolk	Suffolk	
Algae	<i>Anotrichium barbatum</i>	a Red Alga						1	1
Amphibian	<i>Bufo calamita</i>	Natterjack Toad					1	1	2
Amphibian	<i>Rana lessonae</i>	Pool Frog					1		1
Amphibian	<i>Triturus cristatus</i>	Great Crested Newt		1	1	1	1	1	5
Bee	<i>Bombus sylvarum</i>	Shrill Carder Bee			1				1
Beetle	<i>Amara strenua</i>	a Ground Beetle					1		1
Beetle	<i>Badister peltatus</i>	a Ground Beetle					1		1
Beetle	<i>Cicindela maritima</i>	Dune tiger Beetle					1		1
Beetle	<i>Cryptocephalus exiguus</i>	Pashford pot beetle						1	1
Beetle	<i>Donacia aquatica</i>	a Reed Beetle					1		1
Beetle	<i>Ernoporus tiliae</i>	Bast bark beetle					1		1
Beetle	<i>Harpalus froelichi</i>	a Ground Beetle					1		1
Beetle	<i>Harpalus punctatulus</i>	a Ground Beetle					1		1
Beetle	<i>Lucanus cervus</i>	Stag Beetle			1	1		1	3
Beetle	<i>Melanapion minimum</i>	a Weevil					1		1
Beetle	<i>Psylliodes sophiae</i>	Flixweed leaf beetle					1		1
Beetle	<i>Rhynchaenus testaceus</i>	Jumping Weevil					1		1
Bird	<i>Alauda arvensis</i>	Skylark		1	1		1	1	4
Bird	<i>Botaurus stellaris</i>	Bittern		1	1	1	1	1	5
Bird	<i>Burhinus oediconemus</i>	Stone Curlew		1	1		1	1	4
Bird	<i>Caprimulgus europaeus</i>	Nightjar					1	1	2
Bird	<i>Carduelis cannabina</i>	Linnet					1	1	2
Bird	<i>Emberiza schoeniclus</i>	Reed Bunting					1	1	2
Bird	<i>Lanius collurio</i>	Red-Backed Shrike					1		1
Bird	<i>Lullula arborea</i>	Woodlark					1	1	2
Bird	<i>Miliaria calandra</i>	Corn Bunting					1	1	2
Bird	<i>Muscicapa striata</i>	Spotted Flycatcher					1	1	2
Bird	<i>Passer montanus</i>	Tree Sparrow				1	1	1	3
Bird	<i>Perdix perdix</i>	Grey Partridge		1	1		1	1	4
Bird	<i>Pyrrhula pyrrhula</i>	Bullfinch					1	1	2
Bird	<i>Streptopelia turtur</i>	Turtle Dove					1	1	2
Bird	<i>Turdus philomelos</i>	Song Thrush	1	1	1		1	1	5
Butterfly	<i>Lycaena dispar</i>	Large Copper Butterfly		1			1		2
Butterfly	<i>Mellicta athalia</i>	Heath Fritillary			1				1
Butterfly	<i>Plebejus argus</i>	Silver-studded Blue					1	1	2
Cricket	<i>Stethophyma grossum</i>	Large Marsh Grasshopper					1		1
Crustacean	<i>Austropotamobius pallipes</i>	Freshwater White-clawed Crayfish	1	1	1	1	1	1	6
Crustacean	<i>Gammarus insensibilis</i>	Lagoon Sand Shrimp					1		1
Fish	<i>Alosa fallax</i>	Twaite Shad			1				1
Fly	<i>Asilus crabroniformis</i>	Hornet robberfly			1				1

Group	BAP Name	Common Name	Bedfordshire	Cambridgeshire	Essex	Hertfordshire	Norfolk	Suffolk	Counties with Action Plan in East of England
Fungus	<i>Battarraea phalloides</i>	Sandy Stilt Puffball					1	1	2
Fungus	<i>Buglossoporus pulvinus</i>	Oak Polypore						1	1
Fungus	<i>Poronia punctata</i>	Nail Fungus					1		1
Lichen	<i>Buellia asterella</i>	Starry Breck-lichen					1	1	2
Lichen	<i>Caloplaca luteoalba</i>	Orange-Fruited Elm-lichen					1	1	2
Lichen	<i>Enterographa sorediata</i>	a Lichen					1		1
Lichen	<i>Lecanactis hemisphaerica</i>	Churchyard Lecanactis					1		1
Liverwort	<i>Lophozia rutheana</i>	Norfolk Flapwort					1		1
Mammal	<i>Arvicola terrestris</i>	Water Vole	1	1	1	1	1	1	6
Mammal	<i>Barbastella barbastellus</i>	Barbastelle Bat	1				1	1	3
Mammal	<i>Lepus europaeus</i>	Brown Hare		1	1		1	1	4
Mammal	<i>Lutra lutra</i>	Otter	1	1	1	1	1	1	6
Mammal	<i>Muscardinus avellanarius</i>	Dormouse	1	1	1	1		1	5
Mammal	<i>Phocoena phocoena</i>	Harbour Porpoise			1		1	1	3
Mammal	<i>Pipistrellus pipistrellus</i>	Pipistrelle Bat	1	1	1		1	1	5
Mammal	<i>Rhinolophus hipposideros</i>	Lesser Horseshoe Bat						1	1
Mammal	<i>Sciurus vulgaris</i>	Red Squirrel					1	1	2
Mollusc	<i>Anisus vorticulus</i>	Ramshorn snail					1	1	2
Mollusc	<i>Pseudanodonta complanata</i>	Depressed River Mussel					1	1	2
Mollusc	<i>Segmentina nitida</i>	Shining ram` s-horn snail		1	1		1	1	4
Mollusc	<i>Tenella adspersa</i>	Lagoon sea slug					1		1
Mollusc	<i>Vertigo angustior</i>	Narrow-mouthed whorl snail					1	1	2
Mollusc	<i>Vertigo moulinsiana</i>	Desmoulin`s whorl snail		1	1		1	1	4
Moss	<i>Hamatocaulis vernicosus</i>	Slender Green Feather-moss					1		1
Moss	<i>Leptodontium gemmascens</i>	Thatch Moss						1	1
Moth	<i>Idaea ochrata cantata</i>	Bright Wave			1			1	2
Seaanemone	<i>Nematostella vectensis</i>	Starlet Sea Anemone					1	1	2
Spider	<i>Dolomedes plantarius</i>	Fen Raft Spider					1		1
Spider	<i>Euophrys browni</i>	Jumping spider					1		1
Stonewort	<i>Chara baltica</i>	Baltic Stonewort					1		1
Stonewort	<i>Chara canescens</i>	Bearded Stonewort					1		1
Stonewort	<i>Tolypella intricata</i>	Tassel Stonewort						1	1
True Bug	<i>Hydrometra gracilentata</i>	Lesser Water Measurer					1		1
True Bug	<i>Orthotylus rubidus</i>	Plant bug					1		1
VascularPlant	<i>Alisma gramineum</i>	Ribbon-leaved Water-plantain		1			1		2
VascularPlant	<i>Arabis glabra</i>	Tower Mustard					1	1	2
VascularPlant	<i>Centaurea cyanus</i>	Cornflower				1		1	2
VascularPlant	<i>Filago lutescens</i>	Red-tipped Cudweed					1	1	2
VascularPlant	<i>Liparis loeselii</i>	Fen Orchid					1		1
VascularPlant	<i>Luronium natans</i>	Floating Water Plantain					1		1

Group	BAP Name	Common Name	Counties with Action Plan in East of England						
			Bedfordshire	Cambridgeshire	Essex	Hertfordshire	Norfolk	Suffolk	
VascularPlant	<i>Najas marina</i>	Holly-leaved Naiad					1		1
VascularPlant	<i>Pilularia globulifera</i>	Pillwort					1	1	2
VascularPlant	<i>Potamogeton compressus</i>	Grass-wrack Pondweed					1		1
VascularPlant	<i>Scandix pecten-veneris</i>	Shepherd's Needle					1	1	2
VascularPlant	<i>Silene gallica</i>	Small-flowered Catchfly					1	1	2
VascularPlant	<i>Sium latifolium</i>	Greater Water Parsnip					1	1	2
VascularPlant	<i>Torilis arvensis</i>	Spreading Hedge Parsley					1	1	2
VascularPlant	<i>Valerianella rimosa</i>	Broad-Fruited Corn Salad	1						1
Wasp	<i>Cerceris quinquefasciata</i>	a Solitary Wasp					1		1
Worm	<i>Hirudo medicinalis</i>	Medicinal Leech					1		1

Table 3 : Habitat action plans by county (22 items)

BAP Name	Counties with Action Plan in East of England						
	Bedfordshire	Cambridgeshire	Essex	Hertfordshire	Norfolk	Suffolk	
Ancient and/or species-rich hedgerows	1	1	1		1	1	5
Aquifer fed naturally fluctuating water bodies					1		1
Cereal field margins	1	1	1		1	1	5
Chalk rivers	1				1		2
Coastal and floodplain grazing marsh	1	1	1	1	1	1	6
Coastal vegetated shingle						1	1
Eutrophic standing waters					1	1	2
Fens	1	1			1	1	4
Littoral and sublittoral chalk					1		1
Lowland beech and yew woodland		1			1		2
Lowland calcareous grassland	1	1		1	1		4
Lowland dry acid grassland	1			1	1	1	4
Lowland heathland	1	1	1	1	1	1	6
Lowland meadows	1				1	1	3
Lowland mixed deciduous woodland	1	1	1	1		1	5
Lowland wood-pasture and parkland	1	1			1	1	4
Maritime cliff and slopes					1	1	2
Mesotrophic lakes					1		1
Reedbeds	1	1	1	1	1	1	6
Saline lagoons			1		1	1	3
Seagrass beds			1		1	1	3
Wet woodland	1	1			1	1	4

Table 4 : Broad habitat action plans in existence in East of England

Broad habitat	Bedfordshire	Cambridgeshire	Essex	Hertfordshire	Norfolk	Suffolk	Counties with action plan in East of England
Acid grasslands		1					1
Arable and horticulture	1	1	1				3
Boundary and linear features	1	1	1				3
Bracken	1						1
Built up areas and gardens	1	1	1			1	4
Coniferous woodland	1						1
Fen, marsh and swamp	1						1
Improved grassland	1						1
Neutral grassland	1	1		1			3
Rivers and streams	1	1					2
Standing open water and canals	1	1					2

Assessment of Species and Habitat Action Plans

Outline of method used

All of the action plans subject to detailed investigation were assessed for their significance in a national context. Two main criteria were used:

- Status change in past 25 years - The percentage decline of the species, paralleling the RSPB categories for Birds of Conservation Concern as a guideline for significance.
- Current status - The relative proportion of resource the region holds, based roughly upon the number of regions within the UK as a guide.

The categories the action plans were assigned to are given in Table 5.

Table 5 : Categories used to assess significance of species and habitat action plans

	Criteria assessed against	
Significance of BAP	Status change in past 25 years	Current status
Critical	>90% decline in past 25 years	>75% or "endemic" to region
Major	>50% decline in past 25 years (equivalent to Red list)	>50% of national resource/population
High	25 - 50% decline	10-50% of national resource/population
Local	<25% decline	<10%
Cannot be assessed	No historical data	Unclear

Once the action plans had been assigned to these categories an assessment of a third criteria, *Future confidence*, the underlying optimism within the region as to how well the action plan is likely to succeed, was added and an overall assessment made.

Summary of results by categories for action plans

The number of action plans for each category included within each final assessment category are shown below in Table 6.

Table 6 : Number of action plans within each assessment category

Group	Critical	Major	High	Local	Cannot be assessed	Total number
Algae				1		1
Amphibian		1	1	1		3
Bee		1				1
Beetle	3	5	1	2		11
Bird		3	5	7		15
Butterfly	1	1		1		3
Cricket				1		1
Crustacean			1		1	2
Fish					1	1
Fly			1			1
Fungus				2	1	3
Habitat		6	6	9	5	26
Lichen	1			2		3
Liverwort				1		1
Mammal			1	3	5	9
Mollusc		2	3			5
Moss					2	2
Moth					1	1
Sea anemone			1			1
Spider	1	1				2
Stonewort	1	1			1	3
True Bug			2			2
Vascular Plant			3	11		14
Wasp	1		1			2
Worm				1		1
Totals	8	21	26	42	17	114

The discrepancy of total number of habitats between Table 3 : Habitat action plans by county (22 items) and the table above is caused by the assessment of four additional habitats without action plans within the East of England: *Coastal saltmarsh, Coastal sand dunes, Mudflats and Purple moor-grass and rush pasture.*

Summary of action plans where an assessment was not possible for one criteria

A summary of where a single criteria could not be assessed as a result of a lack of information is presented below in Table 7.

Table 7 : Numbers of action plans where assessment of a single criteria was not possible

Decline criteria	Resource criteria	Number of BAPs
Major	Cannot be assessed	1
High	Cannot be assessed	3
Local	Cannot be assessed	6
Cannot be assessed	High	9
Cannot be assessed	Local	21
Cannot be assessed	Major	3

Summary of assessment for habitat action plans

On the basis of the assessment the following 12 habitats action plans were identified as being particularly important in a national context:

Table 8 : Nationally important habitat action plans within the East of England

BAP Name	Overall assessment
Ancient and/or species-rich hedgerows	Major
Coastal and floodplain grazing marsh	Major
Coastal saltmarsh	Major
Reedbeds	Major
Saline lagoons	Major
Cereal field margins	Major
Aquifer fed naturally fluctuating water bodies	High
Coastal vegetated shingle	High
Lowland dry acid grassland	High
Lowland heathland	High
Lowland Mixed Deciduous Woodland	High
Wet woodland	High

The following nine habitat action plans were not identified as being important in a national context, but were characteristic of the region and therefore of importance at a regional level.

Table 9 : Regionally significant habitat action plans within the East of England

BAP Name	Overall assessment
Coastal sand dunes	Local
Eutrophic standing waters	Local
Littoral and sublittoral chalk	Local
Lowland calcareous grassland	Local
Maritime cliff and slopes	Local
Mesotrophic lakes	Local
Mudflats	Local
Purple moor grass and rush pastures	Local
Seagrass beds	Local

An assessment was not possible for the following action plans for habitats, because suitable data was not available for current extent or historical decline:

Table 10 : Habitat action plans for which an assessment was not possible

BAP Name	Overall assessment
Chalk rivers	Cannot be assessed
Fens	Cannot be assessed
Lowland meadows	Cannot be assessed
Lowland beech and yew woodland	Cannot be assessed
Lowland pasture and parkland	Cannot be assessed

Summary of assessment for species action plans

The following 43 species action plans were identified as being particularly important in a national context.

Table 11 : Nationally important species action plans within the East of England

Group	Common Name	BAP Name	Overall assessment
Beetle	Pashford pot beetle	<i>Cryptocephalus exiguus</i>	Critical
Beetle	a Ground Beetle	<i>Harpalus froelichi</i>	Critical
Beetle	Flixweed leaf beetle	<i>Psylliodes sophiae</i>	Critical
Butterfly	Silver-studded Blue	<i>Plebejus argus</i>	Critical
Lichen	Starry Breck-lichen	<i>Buellia asterella</i>	Critical
Spider	Jumping spider	<i>Euophrys browningi</i>	Critical
Stonewort	Bearded Stonewort	<i>Chara canescens</i>	Critical
Wasp		<i>Cerceris quadricincta</i>	Critical
Amphibian	Great Crested Newt	<i>Triturus cristatus</i>	Major
Bee	Shrill Carder Bee	<i>Bombus sylvarum</i>	Major
Beetle	Bast bark beetle	<i>Ernoporus tiliae</i>	Major
Beetle	a Ground Beetle	<i>Harpalus punctatulus</i>	Major
Beetle	Stag Beetle	<i>Lucanus cervus</i>	Major
Beetle	a Weevil	<i>Melanapion minimum</i>	Major
Beetle	Jumping Weevil	<i>Rhynchaenus testaceus</i>	Major
Bird	Bittern	<i>Botaurus stellaris</i>	Major
Bird	Stone Curlew	<i>Burhinus oedichnemus</i>	Major
Bird	Woodlark	<i>Lullula arborea</i>	Major
Butterfly	Large Copper Butterfly	<i>Lycaena dispar</i>	Major
Mollusc	Ramshorn snail	<i>Anisus vorticulus</i>	Major
Mollusc	Shining ram`s-horn snail	<i>Segmentina nitida</i>	Major
Spider	Fen Raft Spider	<i>Dolomedes plantarius</i>	Major
Stonewort	Baltic Stonewort	<i>Chara baltica</i>	Major
Amphibian	Natterjack Toad	<i>Bufo calamita</i>	High
Beetle	Dune tiger Beetle	<i>Cicindela maritima</i>	High
Bird	Nightjar	<i>Caprimulgus europaeus</i>	High
Bird	Corn Bunting	<i>Miliaria calandra</i>	High
Bird	Tree Sparrow	<i>Passer montanus</i>	High
Bird	Turtle Dove	<i>Streptopelia turtur</i>	High
Bird	Song Thrush	<i>Turdus philomelos</i>	High
Crustacean	Lagoon Sand Shrimp	<i>Gammarus insensibilis</i>	High
Fly	Hornet robberfly	<i>Asilus crabroniformis</i>	High
Mammal	Barbastelle Bat	<i>Barbastella barbastellus</i>	High
Mollusc	Depressed River Mussel	<i>Pseudanodonta complanata</i>	High
Mollusc	Narrow-mouthed whorl snail	<i>Vertigo angustior</i>	High
Mollusc	Desmoulin`s whorl snail	<i>Vertigo moulinsiana</i>	High
Sea anemone	Starlet Sea Anemone	<i>Nematostella vectensis</i>	High
True Bug	Lesser Water Measurer	<i>Hydrometra gracilentia</i>	High
True Bug	Plant bug	<i>Orthotylus rubidus</i>	High
Vascular Plant	Cornflower	<i>Centaurea cyanus</i>	High
Vascular Plant	Red-tipped Cudweed	<i>Filago lutescens</i>	High
Vascular Plant	Spreading Hedge Parsley	<i>Torilis arvensis</i>	High
Wasp	a Solitary Wasp	<i>Cerceris quinquefasciata</i>	High

The following species action plans were not seen as being important in a national context, but were characteristic of the region and therefore of importance at a regional level.

Table 12 : Regionally significant species action plans within the East of England

Group	Common Name	BAP Name	Overall assessment
Algae	a Red Alga	<i>Anotrichium barbatum</i>	Local
Amphibian	Pool Frog	<i>Rana lessonae</i>	Local
Beetle	a Ground Beetle	<i>Amara strenua</i>	Local
Beetle	a Ground Beetle	<i>Badister peltatus</i>	Local
Bird	Linnet	<i>Carduelis cannabina</i>	Local
Bird	Bullfinch	<i>Pyrrhula pyrrhula</i>	Local
Bird	Grey Partridge	<i>Perdix perdix</i>	Local
Bird	Spotted Flycatcher	<i>Muscicapa striata</i>	Local
Bird	Reed Bunting	<i>Emberiza schoeniclus</i>	Local
Bird	Skylark	<i>Alauda arvensis</i>	Local
Bird	Red-Backed Shrike	<i>Lanius collurio</i>	Local
Butterfly	Heath Fritillary	<i>Mellicta athalia</i>	Local
Cricket	Large Marsh Grasshopper	<i>Stethophyma grossum</i>	Local
Fungus	Oak Polypore	<i>Buglossoporus pulvinus</i>	Local
Fungus	Sandy Stilt Puffball	<i>Battarraea phalloides</i>	Local
Lichen	Churchyard Lecanactis	<i>Lecanactis hemisphaerica</i>	Local
Lichen	Orange-Fruited Elm-lichen	<i>Caloplaca luteoalba</i>	Local
Liverwort	Norfolk Flapwort	<i>Lophozia rutheana</i>	Local
Mammal	Red Squirrel	<i>Sciurus vulgaris</i>	Local
Mammal	Otter	<i>Lutra lutra</i>	Local
Mammal	Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	Local
Vascular Plant	Grass-wrack Pondweed	<i>Potamogeton compressus</i>	Local
Vascular Plant	Fen Orchid	<i>Liparis loeselii</i>	Local
Vascular Plant	Tower Mustard	<i>Arabis glabra</i>	Local
Vascular Plant	Ribbon-leaved Water-plantain	<i>Alisma gramineum</i>	Local
Vascular Plant	Holly-leaved Naiad	<i>Najas marina</i>	Local
Vascular Plant	Small-flowered Catchfly	<i>Silene gallica</i>	Local
Vascular Plant	Pillwort	<i>Pilularia globulifera</i>	Local
Vascular Plant	Shepherd's Needle	<i>Scandix pecten-veneris</i>	Local
Vascular Plant	Floating Water Plantain	<i>Luronium natans</i>	Local
Vascular Plant	Broad-Fruited Corn Salad	<i>Valerianella rimosa</i>	Local
Vascular Plant	Greater Water Parsnip	<i>Sium latifolium</i>	Local
Worm	Medicinal Leech	<i>Hirudo medicinalis</i>	Local

Assessments were not possible for the following species action plans.

Table 13 : Species action plans for which an assessment was not possible

Group	Common Name	BAP Name	Overall assessment
Crustacean	Freshwater White-clawed Crayfish	<i>Austropotamobius pallipes</i>	Cannot be assessed
Fish	Twaite Shad	<i>Alosa fallax</i>	Cannot be assessed
Fungus	Nail Fungus	<i>Poronia punctata</i>	Cannot be assessed
Mammal	Brown Hare	<i>Lepus europaeus</i>	Cannot be assessed

Group	Common Name	BAP Name	Overall assessment
Mammal	Water Vole	<i>Arvicola terrestris</i>	Cannot be assessed
Mammal	Dormouse	<i>Muscardinus avellanarius</i>	Cannot be assessed
Mammal	Harbour Porpoise	<i>Phocoena phocoena</i>	Cannot be assessed
Mammal	Pipistrelle Bat	<i>Pipistrellus pipistrellus</i>	Cannot be assessed
Moss	Thatch Moss	<i>Leptodontium gemmascens</i>	Cannot be assessed
Moss	Slender Green Feather-moss	<i>Hamatocaulis vernicosus</i>	Cannot be assessed
Moth	Bright Wave	<i>Idaea ochrata cantitata</i>	Cannot be assessed
Stonewort	Tassel Stonewort	<i>Tolypella intricata</i>	Cannot be assessed

Issues affecting Biodiversity Action Planning within the East of England

The issues presented within this audit for action plans originate mainly from the LBAPs themselves as a source and many of these may have previously originated from the national BAPs. No attempt was made to investigate these more thoroughly as they fell outside the core work of the audit, but they may be worthy of further investigation at a later date.

However the following were frequently repeated themes observed during the audit and illustrative examples are given of habitats or species where the issue applies.

Table 14 : Common issues raised during work for BAP audit

Issue	Possible regional example
Agricultural change	Agricultural improvement of <i>Lowland meadows</i> through, drainage, ploughing, re-seeding, fertiliser treatment, slurry application, conversion to arable and a shift from hay-making to silage production has led to habitat loss and a decline in diversity. For <i>Cereal field margins</i> the shift to winter cropping and the associated loss of winter stubbles reduces survival of winter germinating weeds.
Coastal changes	<i>Starlet Sea anemone</i> is likely to be affected by coastal changes in the coming decades as a result of the landward movement of coastal shingle ridges and coastal squeeze/sea level rise.
Climate Change	For <i>Lowland beech and yew woodland</i> Forestry Commission research on the effects of climate change for trees and woodlands in the East of England revealed that beech will not be suitable to plant across much of the region by 2080.
Development	For <i>Ancient and/or species rich hedgerows</i> loss due to development is still taking place. Neglect resulting from future development speculation has already been mentioned.
Hydrological change	<i>Fens</i> can suffer from excessive water abstraction from aquifers for agricultural or manufacturing use. Abstraction may also affect the balance between the differing qualities of ground water and surface water.
Introduced species	<i>White-clawed Crayfish</i> are affected by direct competition from three non-native crayfish species that are now breeding in the wild. Non-native species have been released deliberately for later harvesting in some areas. Crayfish Plague is a virulent disease carried by non-native crayfish species that kills white-clawed crayfish.
Lack of management/ inappropriate management	For <i>Dormouse</i> changes in woodland management practice, notably cessation or inappropriate management of hazel coppicing, have caused significant declines. The decline of coppicing or coppicing in large blocks or in very short rotation have all been noted as possible reasons for the woodland habitat becoming unsuitable.
Nutrient Enrichment	In many <i>Mesotrophic lakes</i> , enrichment by excessive nutrient input (eutrophication) is the major cause of loss in habitat quality. Nutrient inputs can include: sewage effluent; point and diffuse sources associated with agriculture, industry and forestry; and accidental spillages (e.g. slurry).
Recreational pressure	Recreational pressure is an issue for <i>Lowland Heathland</i> particularly close to towns, e.g. Cooper's Hill in Bedfordshire and Martlesham near Ipswich, Suffolk. The uncontrolled walking of dogs causes disturbance, while trampling can cause damage to soils and erosion, and accidental or deliberate fires are a major issue.
Water pollution	For <i>Great Crested Newt</i> breeding ponds can be damaged by indirect effects from agrochemical applications to neighbouring crops, which can cause a deterioration in habitat quality and have direct toxic effects.

The way forward from the audit

Although the audit is not able to be conclusive on many points it does present an opportunity to examine BAP effort at a regional level and should provide an effective starting point to consider the following:

- What further information about a BAP species or habitat is required to aid better delivery of BAP targets?
- How should this information be made available?
- Where can co-ordination between LBAPs be strengthened?
- Which issues affecting the delivery of Biodiversity Action Plan Targets can be best tackled at a regional level?

PART 1 : Introduction

Background to audit

The East of England Biodiversity Forum is a liaison body of governmental and non-governmental organisations that provides a focus for furthering biodiversity in the East of England.

The Forum commissioned this audit to better understand and illustrate the extent and distribution of Biodiversity Action Plan (BAP) priority habitats and species within the East of England. This will form the basis for further debate and analysis as to the appropriateness of regional BAP targets, the key issues influencing the delivery of the biodiversity agenda in the region, and thence priorities for action.

The Biodiversity Audit (and any further work on targets and issues) will help the Biodiversity Forum engage and develop joint working with regional organisations, planners and decision-makers, and enable them to integrate biodiversity into their policies, plans and actions. The audit will feed into and influence the forthcoming Regional Environment Strategy and thence into revised Regional Planning Guidance being drafted during 2002.

A full Glossary, including definitions used, is given at the end of the document.

Objectives of the audit

The objectives of the Biodiversity Audit are to:

- collate and compile existing information to identify, locate and, where possible, quantify the biodiversity resource in the East of England;
- provide a framework to better understand and illustrate the extent and distribution of BAP habitats and species within the East of England;
- present a baseline picture at one moment in time of this biodiversity resource;
- form the basis for further work by the East of England Biodiversity Forum on the appropriateness of regional BAP targets, the key issues influencing the delivery of the BAP agenda, and the prioritisation for BAP implementation;
- feed into and influence the forthcoming Regional Environment Strategy and thence into revised Regional Planning Guidance being drafted during 2002.

Methodology

The East of England Biodiversity Audit draws heavily upon existing published information within County Biodiversity Action Plans, English Nature's Natural Area Profiles and other published documents. The methodology for the audit was as follows.

An initial meeting was held with the steering group to agree a timetable and liaison framework.

Definitive lists were created of BAPs existing within the East of England. This identified definitive existing lists of all BAPs, including broad habitats, habitat action plans (HAPs), species action plans (SAPs) and, where appropriate, local BAPs for each county.

Once these lists had been defined a provisional BAP list was created by collating the national and county lists to provide a provisional regional list for the East of England

area. A major issue within the BAP audit was identifying which locally-produced habitat BAP items were equivalent to national BAPs. As far as possible a cross-reference was made. In some cases splitting of a locally-produced BAP was required between two or more national BAPs.

The provisional regional BAP list was then assessed against county LBAP lists, for the state of development for each BAP. Some BAPs were eliminated at this stage as having no written plan in existence for any of the six counties. The provisional regional BAP list was then agreed with the steering committee and completed as a final regional BAP list.

For each item on the final regional BAP list further information was researched and a report created. Greatest detail was given for habitats and selected example species BAPs.

Distribution data was collected and prepared on the BAPs for habitats and the example species. Many of the BAPs within the audit followed a distribution, much more closely fitted to the Natural Areas approach of English Nature than administrative boundaries, and a decision was made early within the audit to use Natural Areas in the map-based description of the distributions.

The primary data sources used during the audit were documented as far as possible to allow for future reference.

PART 2 : Overview of the East of England

About the East of England

The East of England comprises the countries of Norfolk, Suffolk, Essex, Hertfordshire, Bedfordshire and Cambridgeshire and the Unitary Authority areas of Luton, Peterborough, Southend on Sea and Thurrock.

The Region occupies a land area of 19,120km², and with a population of c.5.5m has a lower population density than the England average. Population growth is, however, one of the fastest in the country, especially in Norfolk and Cambridgeshire. It has a diverse economy with financial intermediation, agriculture, wholesale and retail trade, transport and communication, renting and business activities and construction amongst the sectors that have a larger than average contribution to the regional Gross Domestic Product (GDP). In terms of GDP, the region ranks third when compared with other UK regions.

The East of England has a diverse and contrasting landscape, including the extensive flat, open spaces of intensive arable farming typical of large parts of Cambridgeshire and the intimate rolling landscapes of village, woodland and hedgerow of Bedfordshire and Hertfordshire. Wild, windswept coasts with sand dunes and shingle beaches, and sheltered estuaries teeming with birds typify the coastal areas of Norfolk, Suffolk and Essex. Thetford Forest on the Norfolk/Suffolk border is the largest lowland coniferous forest in the UK.

The region supports important and historic landscapes such as the Broads, Breckland and Chilterns which have been shaped by man's activities over centuries and support an outstanding diversity of habitats and species, many of which are rare on a national scale.

The environmental importance of the East of England is reflected in the large land area protected by national and international conservation and landscape designations.

English Nature has divided England into a series of Natural Areas. Natural Area boundaries are based on the distribution of wildlife, natural features and land use patterns. The East of England comprises the following Natural Areas: The Fens, North Norfolk, Breckland, The Broads, West Anglian Plain, Yardley - Whittlewood Ridge, East Anglian Chalk, East Anglian Plain, Suffolk Coast and Heaths, Bedfordshire Greensand Ridge, Chilterns, London Basin, together with the maritime Natural Areas of Old Hunstanton to Sheringham, Sheringham to Lowestoft, Suffolk Coast, and Greater Thames Estuary.

Biodiversity in the East of England

The East of England has a rich and diverse natural environment containing a high proportion of some of the UK's rarest habitats and species. The environment is one of the East of England's key assets. The region, with its dramatic and often sharp contrasts, ranges from its long, low-lying coastline containing windswept beaches and dunes, and its large scale open arable landscape of the peat Fens to the north, to the more intimate rolling landscapes of mixed woodland and hedgerows occurring more in the south of the region. In some areas, particularly in Norfolk and Suffolk, extensive lowland heathland occurs.

Within the East of England the dominant land use is agriculture with almost 10,000km² in arable cropping and a further 1500 km² in permanent grassland (DEFRA June 2001 census). The farmed landscape is rich in history and wildlife, supporting important habitats and species reliant upon continued agricultural management.

Woodland covers 139,000 hectares (7.3%) of the region, 60% of which is broadleaved. Woodland cover has increased by 25% since 1980. There are 13.6 million living trees outside woodland in the countryside in the East of England.

Areas such as the Broads, Brecklands, the Chilterns and the coast are outstanding in terms of their natural beauty and biodiversity. Coastal and wetland habitats are particularly significant. Other habitats such as ancient woodlands, wet grasslands, chalk grasslands and lowland heaths are also particularly important. Other widespread habitats including hedgerows and verges, support locally important wildlife and are enjoyed by many people.

Rare habitats and species cover a large part of the region within statutory and non-statutory sites. The region contains some 567 notified Sites of Special Scientific Interest covering an area of around 115,700ha (source: English Nature). In recognition of their significant importance, many of these are also protected by European and international designations, including candidate Special Areas of Conservation (cSACs), Special Protection Areas (SPAs) and Ramsar Sites. The Norfolk and Suffolk Broads are one of Europe's most important wetlands and have the equivalent status of a National Park.

The region's environment is a major contributor to its economy supporting in the region of 108,000 – 180,000 jobs (6% - 9% of regional employment) (RSPB 2002). The quality of the countryside plays a significant role in attracting inward investment. It also attracts a large number of visitors who contribute to the local economy. In 1997, a total of 16.5m visitor trips contributed £3.5bn to the region's economy.

Historically, the fragmentation of habitats by intensive land-use has led to often small, isolated wildlife sites, that are difficult to protect and manage. In recent decades the impact of intensive farming methods, including the effects of nutrient run-off, agro-chemical dispersion and changes to cropping patterns, has harmed wildlife.

Arguably, the most significant factor that will affect the region's environment in the future is climate change. Sea level rise is already affecting the region's coastal habitats and a policy of coastal managed realignment would allow for the impact of sea-level rise by creating new habitats to replace those lost. Fluctuations in rainfall patterns may also have a negative impact upon water-dependent habitats such as fens and rivers.

Coastal habitats are highly dynamic and a policy of coastal managed realignment would allow for the impact of sea-level rise by creating new habitats to replace those lost. Many water-dependent fens, rivers and other habitats and species suffer from unreliable water supplies or poor water quality. The region with its long, low-lying coastline and broad river valleys (embanked in the Fens) and claylands, is vulnerable to climatic change and rising sea levels.

Priority habitats and species in the East of England Region

Twenty-six UK priority habitats are identified in the audit as having special significance within the East of England Region. Targets have been established by county biodiversity partnerships for their maintenance, restoration and expansion. These have been grouped into five broad headings for summary purposes in Table 15.

A brief introduction to each of these broad habitat groupings is presented within this section and greater detail for each of the individual Habitat Action Plans is given in PART 3 : Detailed descriptions of BAP habitats within the East of England.

Table 15 : Broad habitat groups and their relationship to Habitat Action Plans in the East of England

Lowland grassland, heath and arable:	Freshwater:
Lowland calcareous grassland	Chalk rivers
Lowland dry acid grassland	Mesotrophic lakes
Lowland meadows	Aquifer fed naturally fluctuating water bodies
Coastal and floodplain grazing marsh	Eutrophic standing waters
Lowland heathland	
Cereal field margins	
Woodland:	Maritime and Coastal:
Lowland mixed deciduous woodland	Maritime cliff and slope
Lowland beech and yew woodland	Coastal vegetated shingle
Wet woodland	Coastal sand dunes
Lowland wood pasture and parkland	Littoral and sub-littoral chalk
Ancient and/or species-rich hedgerows	Coastal saltmarsh
	Mudflats
	Seagrass beds
	Saline lagoons
Bog, fen and swamp:	
Reedbeds	
Fens	
Purple moor-grass and rush pasture	

Lowland grassland, heath and arable land

The following Habitat Action Plans are included within this broad habitat group for the purpose of this report.

Table 16 : Lowland grassland, heath and arable land Habitat Action Plans

<ul style="list-style-type: none"> • Lowland calcareous grassland • Lowland dry acid grassland • Lowland meadows 	<ul style="list-style-type: none"> • Coastal and floodplain grazing marsh • Lowland heathland • Cereal field margins
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Large parts of the region are intensively farmed, comprising arable fields or areas of improved grassland used as pasture, and away from urban areas the region is still very rural in character. Although farmland habitats are extensive, their overall capacity to sustain wildlife has fallen dramatically in recent decades in response to increased intensification. Populations of characteristic farmland wild plants, such as cornflower, broad-leaved cudweed, corn cleavers and shepherd's needle, birds such as corn bunting, linnets, tree sparrow and grey partridge, and mammals such as brown hare, still occur throughout the region, but at much reduced levels. Approximately 72% of the region's farmland is cultivated land compared with a UK average of 29% (source: East of England Rural Development Plan).

Some grasslands of importance for wildlife still remain, although much of the formerly extensive areas of rough grassland have been drained and agriculturally improved across the region. The region continues to support around 23% of the England resource of *Lowland dry acid grassland* (source: English Nature).

Coastal and floodplain grazing marsh is a particularly prominent feature with flood meadows on the plains of the major river systems, and one of the most extensive networks of coastal grazing marshes in England. The washlands of the Nene, Ouse and Cam rivers in the Fens, where areas of permanent grassland are deliberately flooded to prevent rivers over-topping, represent some of the largest surviving

remnants of fenland habitats. Such areas would have been extensive prior to the major rivers being embanked and the floodplains drained. The wet grasslands and ditches of these areas support an important flora and invertebrate fauna, together with internationally important populations of wintering waterfowl. Unimproved neutral grasslands occur on calcareous clays and alluvial deposits, and a few notable species-rich *Lowland meadows* are scattered across the region, the most notable being at Portholme in Cambridgeshire, a site of international importance.

Fragments of *lowland calcareous grasslands* occur across several parts of the region and include sites of national and international importance such as the orchid-rich grasslands of Devil's Dyke in Cambridgeshire and the moss-rich grasslands of the Chilterns.

The mosaic of acid and calcareous soils in Breckland supports an outstanding mix of grassland vegetation types, some of which are of international importance. Breckland also has the only significant area in England of inland dunes, which support a lichen-rich grassland that includes plant species normally found only on the coast.

The East of England is also a key region for *Lowland heathland*, supporting around 15% of the England resource (source: English Nature). This occurs most extensively in Breckland, on the Suffolk coast, in north Norfolk and in the London Basin. Breckland supports significant areas of dry heathland developed under a semi-continental climate, forming mosaics with acid and calcareous grasslands, whilst the Suffolk coast supports extensive areas of a heathland type more characteristic of the western parts of Britain. Although heaths are less extensive than in some other regions, we have some of international importance in the Sandlings and Breckland. In north Norfolk, significant areas of wet and dry heathland occur, largely associated with mires, whilst smaller areas occur on the Greensand Ridge in Bedfordshire.

The lowland grasslands and heaths support a variety of uncommon plants including a number of BAP priority species. The Rex Graham Reserve in Breckland supports the largest population of military orchid in Britain (more than 95%) and Devil's Dyke in Cambridgeshire is one of very few known British dry grassland where lizard orchid occurs. Calcareous grassland in the Chilterns is the only location of the Chiltern gentian whilst acid grassland in Breckland supports the thatch moss, a moss usually found on roof thatch. Heathland in Suffolk supports the red-tipped cudweed, and Breckland has an endemic sub-species of perennial knawel. The mosaics of grasslands and heaths are particularly rich in butterflies and moths, including the BAP species lunar yellow underwing moth, marbled clover moth, tawny wave moth and silver-studded blue butterfly. Heathlands in Breckland and on the Suffolk Sandlings, are nationally important for breeding populations of three BAP species, woodlark, nightjar and stone curlew.

Freshwater

The following Habitat Action Plans are included within this broad habitat group for the purpose of this report.

Table 17 : *Freshwater Habitat Action Plans*

• Chalk rivers	• Eutrophic standing waters
• Mesotrophic lakes	• Aquifer fed naturally fluctuating water bodies

Although the driest part of the country the East of England is also surprisingly the richest region in the UK, both for its range of freshwater habitats types and for its wetland wildlife. The natural and man-made freshwater habitats that occur within the region are of particular importance for the birds which they support. These freshwater

habitats are also major contributors to the character of the region, with the Broads, low-lying large river valleys, fen drainage systems and waterways, and flooded gravel pits of notable significance in this respect.

Lowland rivers (often *Chalk rivers*) are a major feature of the region although many have been modified for flood alleviation or drainage. Notable lowland rivers with a range of aquatic plant communities occur on stretches of the River Wensum in Norfolk, part of the Old Bedford River in the Fens, and the Rivers Nene and Ouse. The River Nar is our best example of a species-rich chalk river, flowing from north Norfolk into the Fens.

In Norfolk, and extending into part of Suffolk, the slow-flowing complex of the rivers Bure, Yare and Waveney and their tributaries and lake systems, form the Norfolk Broads, one of Britain's finest and most extensive wetlands and the only National Park in the region. The shallow *Mesotrophic lakes* and ditch systems of the Broads support fragments of a formerly extensive vegetation type and are some of the richest areas for scarce water plants in the region.

Eutrophic standing waters, represented by large numbers of flooded gravel pits, clay pits, reservoirs, lakes and ponds occur across the region. With their wide range of water and substrate types, these support a corresponding variety of aquatic plant and animals and wintering waterfowl. A series of former clay pits at Orton Pit, Peterborough, supports the largest known population of great crested newts in the UK, the importance of which has been recognised by its identification as a cSAC.

Breckland has a unique series of lakes and pools, including species-rich *Aquifer fed naturally fluctuating water bodies* that occasionally dry out as a result of natural fluctuations in groundwater levels. The area also contains an extensive system of pingos, shallow glacial depressions that sometimes fill with water, which support an unusual fauna, including a remarkable range of invertebrates. Recognition of Breckland's importance is provided by its cSAC status.

Freshwater habitats within the region support a number of nationally rare and nationally scarce plant species including nationally scarce water soldier, whorled water milfoil, broad-leaved pondweed, Loddon pondweed and fen pondweed.

Freshwater habitats within the region are of outstanding importance for wintering waterfowl. Recognition of this is provided by the Ramsar Site and SPA status of a number of sites, including Broadland (supporting internationally important populations of Bewick's and whooper swans, wigeon, gadwall and shoveler) and the reservoirs and gravel pits of the London Basin, including Abberton Reservoir SPA (supporting internationally important wintering wigeon, gadwall and shoveler).

The Broads also support the only British populations of the holly leaved naiad and the Norfolk hawker dragonfly. A number of BAP animal species occur in the rivers, including the shining ramshorn snail, the freshwater pea mussel, the compressed river mussel, white-clawed crayfish and otters. The Broads are a nationally important refuge for water voles. The spined loach occurs in the River Ouse and its tributaries, part of which is a cSAC for this species. The rivers also provide good hunting territories for the ten species of bat recorded in the region.

Bog, fen and swamp

The following Habitat Action Plans are included within this broad habitat group for the purpose of this report.

Table 18 : Bog, fen and swamp Habitat Action Plans

• Reedbeds	• Purple moor-grass and rush pasture
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- Fens

The main concentrations of lowland fen within the UK, representing 80% of the England resource (source: English Nature), occur in the East of England region, and the floodplain of the Broads has the largest expanse of species-rich fen in lowland Britain. Much of the Broads has been designated as a European SAC in recognition especially of its mosaics of vegetation types, that include alkaline fen (short fens composed mainly of sedges), transition mire (characteristic between acid bog and alkaline fen) and the largest example in Britain of calcareous fens with great saw-sedge.

Other internationally important fens occur in the heads of valleys, fed by groundwater springs, a fen type rare in the UK lowlands but which occurs across the region, most notably in Breckland and north Norfolk. Another important type of fen *Purple moor-grass and rush pasture* dominated by purple moor-grass occurs on moist, peaty soils across the region, some identified as cSACs.

A rich mix of other habitats occurs in association with fens, including swamp, reedbeds and carr woodland. Some emerging tensions should be noted in that some hectares of native wet woodland have been removed during the last five years to assist in the restoration of other fen habitat. The region supports more than half of England's *Reedbed* resource (source: English Nature). Swamps and reedbeds occur in river valleys across the region, on the edges of lakes and in old clay and gravel pits, whilst some of the largest reedbeds in England occur in the Broads and on the Suffolk coast.

Dominated by sedges and rushes, most fens have a rich flora that includes numerous rare and scarce plants. Fens in the region support the main British populations of nationally scarce plants, including fibrous tussock-sedge, marsh orchid and milk parsley. A number of BAP plant species grow predominantly in fen habitats, including fen violet, slender green feather moss, the only English populations of fen orchid, and one of the two English populations of Norfolk flapwort.

Mosaics of wetland habitats are very rich in invertebrates, and the fens and reedbeds of the region support populations of two priority BAP species, the leaf beetle *Cryptocephalus exiguus* and the longhorn beetle *Obera oculata* and several of Britain's colonies of the narrow-mouthed whorl snail and many of the English colonies of Desmoulin's whorl snail. Fens and reedbeds are important for populations of rare butterflies and moths.

Reedbeds and swamps also support significant populations of breeding and wintering birds, e.g. Broadland SPA and Minsmere-Walberswick SPA hold internationally important populations of breeding bittern (a priority BAP species), marsh harrier and bearded tit, and are important for other rare breeding species, including Cetti's warbler and Savi's warbler.

Woodland

The following Habitat Action Plans are included within this broad habitat group for the purpose of this report.

Table 19 : Woodland Habitat Action Plans

- | | |
|------------------------------------|---|
| • Lowland mixed deciduous woodland | • Lowland wood pasture and parkland |
| • Lowland beech and yew woodland | • Ancient and/or species-rich hedgerows |
| • Wet woodland | |

The woodlands of the East of England contain around 13% of the broad-leaved woodland in England. The most significant are the *Lowland wood pastures and parkland* with around a quarter of the England resource (source: English Nature).

Part of the region (south Hertfordshire and Essex for example) contain some of the most heavily wooded areas in England with a significant proportion of these woods being of ancient origin. These woodlands are dominated by beech, oak and hornbeam and some are former pasture woodland, where grazing as well as wood production was practiced. There are also a number of parklands, historically grazed by deer. The traditional management of the pasture woodland and parkland is reflected in the presence of many old, pollarded trees which support lichens and dead wood beetles and provide roosts for bats and birds. Deer have recently become a problem for woodland management, with large and increasing populations of Muntjac and Roe and, more locally, Fallow and Red deer, having significant adverse impacts on regeneration and coppice management. The international importance of several woodlands, including Wormley Hoddesdon Park Woods and Epping Forest has been recognized by their cSAC status.

Other important sites include the internationally important alder woods of the Broads, and the ancient oak wood of Staverton Park and the Thicks close to the Suffolk coast, both sites having been identified as cSACs. In addition, large conifer plantations occur in Suffolk and Norfolk, including Thetford Forest in Breckland.

Although many hedges have been lost in the conversion to large-scale arable fields, *Ancient species-rich hedgerows* are a common feature in parts of the region. Most hedges have hawthorn as a major component and vary in form, from the high hedgerows of north Norfolk to the low hedges of Cambridgeshire.

The woodlands and parklands support nationally important communities of deadwood invertebrates, including the rare stag beetle and violet click beetle. A large number of butterflies and moths also occur, including the following BAP species: fan-foot moth, olive crescent moth, common fan-foot moth and pearl bordered fritillary. Ancient woods and parklands in the region also support a notable range of breeding birds, including green woodpecker, great spotted woodpecker, lesser spotted woodpecker, spotted flycatcher, tree pipit and firecrest. Large populations of woodlark and nightjar are found in conifer plantations dependent on the clearfell rotations. Populations of dormouse occur in a number of woods and an isolated population of red squirrels occurs in Thetford Forest in Breckland. The woods are also important habitats for the ten species of bat found in the region; most of the recent British records of the rare barbastelle bat are from Breckland.

Maritime and Coastal

The following Habitat Action Plans are included within this broad habitat group for the purpose of this report.

Table 20 : Maritime and Coastal Habitat Action Plans

• Coastal sand dunes	• Seagrass beds
• Coastal vegetated shingle	• Mudflats
• Saline lagoons	• Littoral and sub-littoral chalk
• Coastal saltmarsh	• Maritime cliff and slope

Large proportions of the coastal areas within the region are designated as of national or international importance, reflecting the particular importance of the extensive and varied coastal and maritime habitats nationally. Although naturally dynamic the coastal

areas are expected to be subject to even greater change in the future as a result of sea-level rise and isostatic change.

Coastal sand dunes occur in major concentrations within the region, most notably in Norfolk, extending along the north coast and on the east coast between Winterton and Great Yarmouth. Whilst the extensive dune system in north Norfolk is mostly calcareous, with the more mobile vegetation types forming large components of the vegetation, in contrast, the dunes that extend from Winterton to Great Yarmouth are acidic, supporting a fixed lichen-rich dune vegetation and the only significant area of dune heath on the east coast of England. Recognition of the international importance of these dune complexes is provided by their cSAC status.

Coastal vegetated shingle occurs at numerous locations along the Norfolk and Suffolk coastline, representing around 20% of the England resource (source: English Nature). Several sites, including The Wash and North Norfolk Coast cSAC, Orfordness to Shingle Street cSAC and Minsmere to Walberswick Heaths and Marshes cSAC, are of international importance for their specialised vegetation. In Norfolk the shingle spit at Blakeney Point extends for almost 12km and is closely interlinked with fringing dunes and saltmarsh, whilst in Suffolk, the sandy shingle ridges that stretch from Minsmere to Walberswick have a well developed strandline vegetation and, at Orfordness, the vegetation shows a good illustration of the natural transition between saltmarsh and shingle habitats.

A number of natural *Saline lagoons* occur along the coast, many of which result from the percolation of seawater through shingle beaches. In north Norfolk, a number occur between Hunstanton and Sheringham, including those situated between shingle ridges and saltmarsh, as at Salthouse and Cley. On the Suffolk coast, a series of mostly small lagoons have formed behind shingle barriers and, adjacent to the shore of the Ore Estuary, a number of lagoons occur in the shingle bank. Lagoons are a priority habitat under the EC Habitats' Directive and a number of the lagoons in the region have been identified as cSACs, including Benacre to Easton Bavents Lagoons cSAC.

Extensive areas of *Coastal saltmarsh* are supported by the coastal areas of the region, a reflection of their large estuaries and wide intertidal areas. Whilst the Wash has the largest continuous area of saltmarsh in Britain, extensive areas also extend along the north Norfolk, Essex and Suffolk coastlines. In addition to their extent, these sites have a diversity of saltmarsh vegetation, unparalleled in England. Recognition of the international importance of saltmarshes is provided by their cSAC status.

The shores of the region are composed largely of sand and mud. The sediments range from mobile, wave exposed sands on the open coast which support impoverished animal communities such as on the north Norfolk coast, to more stable muddy sediments with abundant invertebrates found in the inner reaches of estuaries, such as those on the Suffolk and Essex coasts. Of additional interest are the intertidal sediments of the Maplin Sands in Essex, supporting large *Seagrass beds* forming a priority BAP habitat.

The sea-bed of the region, like the mainland shores, is predominantly sedimentary in nature, being mixtures of gravel, muds and sands. The Wash has one of the largest expanses of subtidal sandbanks in the UK and is a nursery ground for young commercial fish species including plaice, cod and sole. Beds of horse mussels (a priority BAP habitat) occur on gravel and muddy gravels at the mouth of the Wash and reefs of the tubeworm *Sabellaria spinulosa*, also a priority BAP habitat, occur both in the Wash and in some of the Essex estuaries. Further offshore, the seabed is dominated by coarse and fine muddy sands.

Coastal habitats within the region support a number of nationally rare and scarce plants, including on sand dunes, bedstraw broomrape (a BAP species), on shingle,

nationally scarce sea pea, and on saltmarsh in Essex, pedunculate sea-purslane, at its only location in Britain.

The estuarine habitats of the region are particularly important for waders and wildfowl. The estuaries are valuable staging posts for migrating birds during spring and autumn and support large numbers of internationally important waders and wildfowl throughout the winter, indeed, 15% of the England resource (source: English Nature). Species supported include pink-footed goose, dark-bellied Brent goose, shelduck, wigeon, knot, oystercatcher, grey plover, bar-tailed godwit and black-tailed godwit. Breeding bird species, including redshank and oystercatcher also occur. Many lagoons also support wintering and breeding waterfowl, including nationally important populations of avocet. A number of shingle beaches are important breeding areas for seabirds supporting nationally important populations of little tern, sandwich tern and common tern. Recognition of the international importance of estuarine habitats is provided by their Ramsar Site and SPA status.

A number of invertebrates also occur, including two BAP moth species on saltmarshes, the ground lackey moth and Fisher's estuarine moth, the latter occurring at only one site in Essex. In addition, sand dunes support important populations of the natterjack toad (also a BAP species) and the intertidal flats of the Wash and north Norfolk coast support the only significant population of common seals in England.

PART 3 : Detailed descriptions of BAP habitats within the East of England

The following section contains detailed reports on the BAP habitats within the East of England in alphabetical order as per the following list. Each habitat has also been allocated a unique reference number that is relevant to the East of England.

- | | |
|--|--------------------------------------|
| • Ancient and/or species-rich hedgerows | • Lowland dry acid grassland |
| • Aquifer fed naturally fluctuating water bodies | • Lowland meadows |
| • Cereal field margins | • Lowland heathland |
| • Chalk rivers | • Lowland mixed deciduous woodland |
| • Coastal and floodplain grazing marsh | • Lowland wood pasture and parkland |
| • Coastal saltmarsh | • Maritime cliff and slope |
| • Coastal sand dunes | • Mesotrophic lakes |
| • Coastal vegetated shingle | • Mudflats |
| • Eutrophic standing waters | • Purple moor-grass and rush pasture |
| • Fens | • Reedbeds |
| • Littoral and sub-littoral chalk | • Saline lagoons |
| • Lowland beech and yew woodland | • Seagrass beds |
| • Lowland calcareous grassland | • Wet woodland |

PART 4 : Species case studies

During the process of the audit a number of species were selected for case studies. These species were either characteristic of, or particularly significant in, the East of England, but these species should not be considered as necessarily the 12 most important. The case studies are more fully developed to allow a greater understanding and illustration of the issues involved within biodiversity action for species in the East of England. As per the habitats, each species has also been allocated a unique reference number that is relevant to the East of England.

The species selected for case studies are listed in Table 21 below. Brief details of each of the species are given below.

Table 21 : Case study species

<ul style="list-style-type: none">• Bittern• Brown hare• Cornflower• Dormouse• Fen orchid• Great Crested Newt	<ul style="list-style-type: none">• Silver studded blue• Stag beetle• Starlet sea anemone• Tree sparrow• Water vole• White-clawed Crayfish
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Bittern

The bittern is a large, brown, secretive heron confined almost entirely to wetlands dominated by reed where it feeds on fish and amphibians. It is rarely seen but its presence can be recorded by the characteristic booming of the male birds.

It is a declining, localised and rare breeding species confined almost entirely to lowland areas in Norfolk, Suffolk and Lancashire. The UK population had declined to fifteen or sixteen booming males in 1994 from a peak of 70 pairs in the late 1960s, when it bred in eight counties. Numbers are boosted in winter by continental immigrants (usually less than 100).

The species was chosen as a nationally-threatened BAP species, characteristic of wetland habitats, with a significant proportion of its population present in the East of England.

Brown hare

The brown hare is a common and widespread farmland species in Britain. It is most abundant in arable areas with cereal farming although woods and hedgerows provide cover and resting areas. It was probably introduced by the Romans from mainland Europe.

Formerly considered abundant, the brown hare appears to have undergone a substantial decline in numbers since the early 1960s although information from shooting estates suggests that hare numbers have remained stable for the past ten years, although other evidence of this is unclear. Similar patterns of population change appear to have occurred throughout much of Europe.

The species was chosen as a regionally widespread, but declining species, characteristic of farmland habitats.

Cornflower

The cornflower is an annual plant of arable fields and favours sandy acidic soils. The flowers are usually blue on an erect, wiry stem that usually has many slender erect branches. It was once a prolific plant in the UK and seen as a troublesome field weed and competitive with cereal crops.

Changes in farming methods and use of herbicides and pesticides have resulted in the gradual disappearance of many arable weeds and the cornflower is now classified as endangered in the UK.

The species was chosen as a regionally rare and declining plant species, strongly dependent on arable field margins and sensitive arable management.

Dormouse

The dormouse with its characteristic furry tail and orange/brown fur, is a nocturnal, arboreal rodent which inhabits mixed broadleaved woodland, hedgerows and orchards and feeds on seeds, nuts and berries, especially amongst hazel, sweet chestnut and bramble. It is largely confined to southern England and although still widespread is patchily distributed with less than 10 adults per hectare present even in good habitats.

Dormouse was chosen as a particularly emblematic declining mammal species of ancient woodland and hedgerows.

Fen orchid

This is a relatively small orchid that has never been particularly common and is only found in East Anglia and South Wales. In the East of England it is found on fenland habitat whereas in South Wales it occurs in the early successional phases of dune slack development.

Fen orchid was chosen as a rare and declining species, wholly dependent upon *Fens* in the East of England.

Great Crested Newt

The great crested newt (or warty) newt is the largest of the three newt species occurring in Britain. It lives in ponds with clear water and a variety of aquatic vegetation in the spring and early summer. In late summer and autumn it leaves water to live under stones or in soil, feeding on invertebrates before hibernating. It is quite widespread in Britain and can be numerous in parts of lowland England and Wales, but is absent from Cornwall and Devon.

The species has suffered a decline in recent years with studies in the 1980s indicating a national rate of colony loss of 2% over 5 years. The British population is amongst the largest in Europe where it is threatened in several countries.

Great Crested Newt was chosen as a relatively widespread, but declining species within the region, dependent on both agricultural practice and wetland habitats.

Silver Studded Blue

The silver studded blue is one of the most beautiful heathland butterflies. The male has blue wings with a white edge to the wings outside a narrow black stripe, while the female is brown with orange markings. The 'silver studs' are bright blue spots on the undersides of the wing.

The butterfly lays its eggs mainly on heather, often where it overhangs warm bare soil. The pupae of the butterfly exude sugars which are attractive to ants which carry the

pupae into their burrows over winter to feed. Both ant and butterfly benefit – the ant gets food and the butterfly gets shelter from the cold.

Silver-studded Blue was chosen as a declining species, dependent on heathland.

Stag Beetle

The stag beetle is the largest terrestrial insect in Britain. Its name is derived from the large antler like jaws of the male which are mainly used for wrestling with other males. Adults are black with chestnut wing cases and are most likely to be seen in the summer months when they fly to find mates and may be attracted to lights in houses. The species breed in rotting tree stumps and other sources of decaying wood where the larvae will remain for four years.

This beetle is widespread in southern England. It is now scarce outside the Thames valley, southern East Anglia and the New Forest.

Stag Beetle was chosen as a relatively widespread species, strongly dependent upon broad-leaved woodland and wood-pasture habitats.

Starlet Sea Anemone

The starlet sea anemone is translucent and colourless and only 2cm long. It is usually found buried upright in soft muds at the edges of creeks in saltmarshes and in brackish pools, sometimes attached to sea grasses or algae. It feeds on small invertebrates associated with mudflats.

The Starlet sea anemone is one of the rarest sea anemones in England and is under threat because the habitats where it is found are particularly vulnerable to sea level change and coastal squeeze.

Starlet sea-anemone is a species dependent upon *Saline lagoons* and one that seems highly likely to be affected by coastal changes in the coming decades.

Tree Sparrow

The tree sparrow is approximately 14cm long and easily distinguished from the house sparrow by a brown cap and neck and a black patch on white cheeks. It lives mainly in open country, woods, gardens and some towns, building nests of straw, dry grass and feathers in hollow trees and walls. It is patchily distributed on farmland across Britain and Ireland but according to the Common Bird Census numbers have declined by 85% between the two breeding atlas periods 1968-72 and 1988-91. Its range has also decreased with particular losses in Wales and Scotland.

Tree sparrow is a bird strongly affected by changes in arable practices, that although still widespread in the region has undergone extremely negative changes in population levels.

Water Vole

The water vole (or water rat) is the largest of the British voles. It was formerly common along the banks of rivers, streams, ditches, dykes, lakes and ponds throughout mainland Britain but has declined in distribution and numbers in recent years. This is thought to be due to changing management of watercourses and possibly predation by the introduced mink.

The water vole is herbivorous and makes characteristic burrows and latrines among riverside vegetation.

Water voles were chosen as charismatic species with a wide distribution throughout the East of England, strongly dependent on ditch, fen and river management.

White-clawed Crayfish

The white-clawed crayfish is the only native species of freshwater crayfish in the UK. It is found in clean, calcareous streams, rivers and lakes in England and Wales and occurs in a few areas in Northern Ireland. Populations have suffered dramatic losses in recent years as it is vulnerable to modifications through management of rivers and changes in water quality, it is out-competed by non-native crayfish and has suffered from crayfish plague that is present in this country any only affects the native species.

White-clawed crayfish were chosen as a declining species characteristic of *Chalk rivers* and strongly dependent on changes in river management and regimes, but widespread through much of the region.

PART 5 : Assessment of the importance of BAP habitats and species within the East of England

There are in excess of 100 BAP habitats and species in the East of England. Parts 3 and 4 of this report have given detail of these BAPs. Where species BAPs have not been previously covered in PART 4 : Species case studies, a full report is contained in the Appendix.

The assessment of this part of the Biodiversity Audit is intended to enable decision makers at the regional level of the East of England to focus down from the full list of East of England BAPs onto those where action will have the greatest 'added value' for the national BAP effort, and for which co-ordination could best occur at the regional level.

The method used a criteria-based system to achieve the assessment.

Method used for assessment

The method attempts to summarise the relevant importance of the various regional BAPs to the national BAP effort. This assessment has been made based upon two key criteria and a third modifying criteria.

The two key criteria are:

- Status change in the past 25 years, reflecting the seriousness of recent decline – species or habitats with substantial recent declines may require urgent action.
- Current status, reflecting the relative proportion of the UK resource which occurs in the East of England – if the East of England holds a substantial part of the UK resource then it is clearly of greater significance to the national BAP.

The modifying criteria is:

- Future confidence, the relative optimism that positive BAP action can occur - those plans where there is high optimism of success could be promoted over those where there is little optimism for change.

The full details of the criteria used for the assessment area shown in Table 22 and the categories used for the assessment are shown in Table 23.

The actual method of assessment uses a maximum value from the criteria "Past 25 years" and "Current status" fulfilled and/or combination of criteria where possible as shown in Table 24. Marginal cases can be reinforced/"promoted" up to one class higher or lower by the future confidence criteria if the author feels this is justified. If this criteria concurs with the other two, it adds weight to assessment in this category.

Table 22 : Criteria to assess significance of regional BAPs to national BAPs

Criteria	Explanation
Status change in past 25 years	The % decline of the species, paralleling the RSPB categories for Birds of Conservation Concern as a guideline for significance.
Current status	The relative proportion of resource the region holds, based roughly upon the number of regions within the UK as a guide. So 10%-50% of resource is regarded as average.
Future confidence	The underlying optimism within the region as to how well the BAP is likely to succeed.

Table 23 : Categories and scoring system used to assess significance of regional BAPs to national BAPs

Significance of BAP	Criteria assessed against					
	Status change in past 25 years ¹	Points "scored"	Current status ²	Points "scored"	Future confidence	Effect on assessment
Critical	>90 % decline in past 25 years	10	>75% or "endemic"	10		
Major	>50% decline in past 25 years (equivalent to Red list)	5	>50% of national resource/ population	5	High optimism. Major plan of action recommended	Class higher?
High	25 - 50% decline	3	10-50% of national resource/ population	3	Moderate optimism	No effect
Local	<25% decline	1	<10%	1	Few specific local actions recommended. Recovery regarded as difficult	Class lower?
Cannot be assessed	No historical data	1 ¹	Unclear	1 ¹	Species requirements unknown. No LBAP written.	No effect

¹ Using criteria as per RSPB Birds of Conservation Concern

² Based roughly upon the number of regions within the UK as a guide. (10%-50% of resource is regarded as average)

Table 24 : Use of criteria for overall assessment

Overall assessment	Criteria required	Equivalent points
Critical	Species/habitat fulfils any Critical criteria (min 11 points) OR Species/ habitat fulfils both Major criteria (10 points)	Approximately 10+ points
Major	Species/habitat fulfils one Major criteria (min 6 points) OR Species/ habitat fulfils both High criteria (6 points)	Approximately 6+ points
High	Species/habitat fulfils one High criteria (3 points)	3 points
Local	Species/habitat fulfils both Local criteria (2 points)	2 points
Cannot be assessed	Species/habitat fulfils both "Cannot be assessed" criteria	2 points

Results of assessment

The results of the assessment are presented in Table 25 : Summary assessment for BAPs within East of England below.

Table 25 : Summary assessment for BAPs within East of England

Regional ID code	UK ID code	Group	BAP name	Common Name	Decline criteria	Resource criteria	Confidence criteria	Overall assessment	Available information
513	101	Algae	<i>Anotrichium barbatum</i>	a Red Alga	Cannot be assessed	Cannot be assessed	Local	Local	
535	173	Amphibian	<i>Bufo calamita</i>	Natterjack Toad	Local	Cannot be assessed	Major	High	No population figures available.
645	545	Amphibian	<i>Rana lessonae</i>	Pool Frog	Extinct	Extinct endemic	Local	Local	Information is accurate
666	619	Amphibian	<i>Triturus cristatus</i>	Great Crested Newt	High	High	Local	Major	Subject of on-going research and action
529	156	Bee	<i>Bombus sylvarum</i>	Shrill Carder Bee	High	High	High	Major	Good level of recording
509	87	Beetle	<i>Amara strenua</i>	a Ground Beetle	Local	Local	Local	Local	In need of survey work to determine status
521	127	Beetle	<i>Badister peltatus</i>	a Ground Beetle	Local	Local	Local	Local	In need of survey work to determine status
549	219	Beetle	<i>Cicindela maritima</i>	Dune tiger Beetle	Local	High	High	High	In need of survey work to determine status
554	248	Beetle	<i>Cryptocephalus exiguus</i>	Pashford pot beetle	Local	Critical	Local	Critical	In need of survey work to determine status
563	289	Beetle	<i>Ernoporus tiliae</i>	Bast bark beetle	Major	High		Major	Little information
575	352	Beetle	<i>Harpalus froelichi</i>	a Ground Beetle	High	Critical	High	Critical	In need of survey work to determine status
576	355	Beetle	<i>Harpalus punctatulus</i>	a Ground Beetle	Local	High	Local	Major	In need of survey work to determine status
599	425	Beetle	<i>Lucanus cervus</i>	Stag Beetle	Cannot be assessed	High	Major	Major	Decline in numbers, but not range
606	443	Beetle	<i>Melanapion minimum</i>	a Weevil	High	High	Local	Major	In need of survey work to determine status
640	539	Beetle	<i>Psylliodes sophiae</i>	Flixweed leaf beetle	High	Critical	High	Critical	In need of survey work to determine status
647	552	Beetle	<i>Rhynchaenus testaceus</i>	Jumping Weevil	Local	High	Local	Major	In need of survey work to determine status

Regional ID code	UK ID code	Group	BAP name	Common Name	Decline criteria	Resource criteria	Confidence criteria	Overall assessment	Available information
505	80	Bird	<i>Alauda arvensis</i>	Skylark	Local	Cannot be assessed	Local	Local	Regional population figures not calculated.
530	159	Bird	<i>Botaurus stellaris</i>	Bittern	High	Major	Major	Major	Good current information.
537	175	Bird	<i>Burhinus oedicanus</i>	Stone Curlew	Local	Major	Major	Major	Good current information.
539	186	Bird	<i>Caprimulgus europaeus</i>	Nightjar	Local	High	Major	High	Based largely on 1992 survey figures
540	188	Bird	<i>Carduelis cannabina</i>	Linnet	Local	?High	Local	Local	Based largely on County Atlas information
561	279	Bird	<i>Emberiza schoeniclus</i>	Reed Bunting	Local	Cannot be assessed	Local	Local	Regional population figures not calculated.
590	402	Bird	<i>Lanius collurio</i>	Red-Backed Shrike	Extinct	Extinct	Local	Local	Information is accurate
600	426	Bird	<i>Lullula arborea</i>	Woodlark	Local	Major	Major	Major	Good current information.
610	457	Bird	<i>Miliaria calandra</i>	Corn Bunting	High	?High	Local	High	Regional population figures not fully calculated.
612	463	Bird	<i>Muscicapa striata</i>	Spotted Flycatcher	High	Cannot be assessed	Local	Local	Regional population figures not calculated.
627	503	Bird	<i>Passer montanus</i>	Tree Sparrow	Major	Cannot be assessed	Local	High	Regional population figures not calculated.
629	506	Bird	<i>Perdix perdix</i>	Grey Partridge	Local	Cannot be assessed	High	Local	Regional population figures not calculated.
643	542	Bird	<i>Pyrrhula pyrrhula</i>	Bullfinch	Local	Cannot be assessed	Local	Local	Regional population figures not calculated.
658	589	Bird	<i>Streptopelia turtur</i>	Turtle Dove	High	?High	Local	High	Regional population figures not fully calculated.
667	621	Bird	<i>Turdus philomelos</i>	Song Thrush	High	Cannot be assessed	Local	High	Regional population figures not calculated.
603	429	Butterfly	<i>Lycaena dispar</i>	Large Copper Butterfly	Critical	Major	Local	Major	Assessment affected by extinct status
608	446	Butterfly	<i>Mellicta athalia</i>	Heath Fritillary	Local	Local	High	Local	Subject of on-going research and action
635	522	Butterfly	<i>Plebejus argus</i>	Silver-studded Blue	Major	High	Major	Critical	Re-introductions underway

Regional ID code	UK ID code	Group	BAP name	Common Name	Decline criteria	Resource criteria	Confidence criteria	Overall assessment	Available information
657	588	Cricket	<i>Stethophyma grossum</i>	Large Marsh Grasshopper	Local	Local	Local	Local	Extinct
519	124	Crustacean	<i>Austropotamobius pallipes</i>	Freshwater White-clawed Crayfish	Cannot be assessed	Local	Local	Cannot be assessed	Decline not recorded quantitatively
571	321	Crustacean	<i>Gammarus insensibilis</i>	Lagoon Sand Shrimp	Local	High	High	High	Some recent surveys undertaken
508	85	Fish	<i>Alosa fallax</i>	Twaite Shad	Cannot be assessed	Cannot be assessed	Cannot be assessed	Cannot be assessed	No information from Norfolk or Suffolk, no statistics available.
517	117	Fly	<i>Asilus crabroniformis</i>	Hornet robberfly	High	Local	Cannot be assessed	High	Good level of recording
523	136	Fungus	<i>Battarraea phalloides</i>	Sandy Stilt Puffball	Cannot be assessed	Local	Local	Local	
536	174	Fungus	<i>Buglossoporus pulvinus</i>	Oak Polypore	Cannot be assessed	Cannot be assessed	Local	Local	No evidence for historical decline
637	528	Fungus	<i>Poronia punctata</i>	Nail Fungus	Cannot be assessed	Cannot be assessed	Cannot be assessed	Cannot be assessed	
465	7	Habitat	Ancient and/or species-rich hedgerows		High	High	High	Major	Difficult to assess as quality has declined as well as quantity. Also possibly much was lost pre 1970.
477	24	Habitat	Aquifer fed naturally fluctuating water bodies		Local	?High	High	High	Quantity data lacking, trend data problematic.
466	8	Habitat	Cereal field margins		Local – High	High	Local – High	Major?	Lack of positive management and intense pressure on land space
478	25	Habitat	Chalk rivers		Cannot be assessed	Cannot be assessed	High	Cannot be assessed	Quantity data lacking, trend data problematic.
467	9	Habitat	Coastal and floodplain grazing marsh		High - Major	High	High	Major	Trend figures variable in quality, current status figures incomplete.
483	33	Habitat	Coastal saltmarsh		Local	High	High	Major	Estimated 100ha/year net loss nationally. Planned to create 40ha/year to replace 600ha lost between 1992-98
480	28	Habitat	Coastal sand dunes		Local	Local	Local	Local	Assessed on figures from Norfolk and Suffolk only. Areas of Essex dunes unavailable to date

Regional ID code	UK ID code	Group	BAP name	Common Name	Decline criteria	Resource criteria	Confidence criteria	Overall assessment	Available information
481	29	Habitat	Coastal vegetated shingle		Cannot be assessed	High	Local	High	Assessed on figures from Norfolk and Suffolk only. Areas of Essex dunes unavailable to date. No data available on decline
476	23	Habitat	Eutrophic standing waters		Cannot be assessed	?High	Local	Local	Lacking sufficient quantity data and no trend data available.
473	18	Habitat	Fens		Cannot be assessed	Cannot be assessed	High	Cannot be assessed	No trend data or national habitat estimate. Missing data from 3 counties.
482	31	Habitat	Littoral and sublittoral chalk		Cannot be assessed	Local	Local	Local	Assessed on limited data available from Norfolk.
462	2	Habitat	Lowland beech and yew woodland		Cannot be assessed	Cannot be assessed	Low	Cannot be assessed	Data missing, except for Chilterns et al due to poor separation of woodland type.
469	12	Habitat	Lowland calcareous grassland		Cannot be assessed	Local	High	Local	Missing data from 3 counties.
470	14	Habitat	Lowland dry acid grassland		Cannot be assessed	High	High	High	Missing data from 3 counties.
471	15	Habitat	Lowland heathland		High	Local	High	High	Quality has declined as well as quantity. New ones planted but old ones removed and neglected
468	10	Habitat	Lowland meadows		Cannot be assessed	Cannot be assessed	High	Cannot be assessed	Assessment limited by lack of figures.
709	N/A	Habitat	Lowland Mixed Deciduous Woodland		Local	High	High	High	Assessment based on nationally available figures for regions
464	5	Habitat	Lowland pasture and parkland		Cannot be assessed	Cannot be assessed	Local	Cannot be assessed	Assessment limited by lack of figures, due to poor separation of woodland type.
479	27	Habitat	Maritime cliff and slopes		Local	Local	Local	Local	Assessed on figures from Norfolk only. No data available from Suffolk or Essex
475	22	Habitat	Mesotrophic lakes		Cannot be assessed	Local	High	Local	Area and trend figures not obtained.

Regional ID code	UK ID code	Group	BAP name	Common Name	Decline criteria	Resource criteria	Confidence criteria	Overall assessment	Available information
484	34	Habitat	Mudflats		Local	Local	Local	Local	Estimated that between 8000-10000ha will be lost nationally due to sea level rise between 1993-2013
472	17	Habitat	Purple moor grass and rush pastures		Cannot be assessed	Local	High	Local	Missing any quantitative data
474	19	Habitat	Reedbeds		Cannot be assessed	Major	Major	Major	Information is accurate, needs updating.
489	42	Habitat	Saline lagoons		Cannot be assessed	High	High	Major	Assessed on figures from Norfolk and Suffolk only. Sea level rise is a constant threat but lagoon creation is being undertaken i.e. the scrapes at Minsmere
485	35	Habitat	Seagrass beds		Cannot be assessed	Local	Local	Local	Accurate data unavailable - evident that further ecological knowledge required to further restoration/recreation of this habitat
463	4	Habitat	Wet woodland		Local	High	High	High	Some estimates of area are vague
534	172	Lichen	<i>Buellia asterella</i>	Starry Breck-lichen	Critical	Critical	Critical	Critical	Some recent surveys undertaken
538	183	Lichen	<i>Caloplaca luteoalba</i>	Orange-Fruited Elm-lichen	Cannot be assessed	Local	Local	Local	
591	404	Lichen	<i>Lecanactis hemisphaerica</i>	Churchyard Lecanactis	Cannot be assessed	Local	Local	Local	
597	422	Liverwort	<i>Lophozia rutheana</i>	Norfolk Flapwort	Cannot be assessed	Local	Local	Local	Current populations are thought to be stable
516	115	Mammal	<i>Arvicola terrestris</i>	Water Vole	Cannot be assessed	Cannot be assessed	Local	Cannot be assessed	Assessment limited by lack of figures.
522	133	Mammal	<i>Barbastella barbastellus</i>	Barbastelle Bat	?High	Cannot be assessed	Local	High	No info from 3 counties, assessment based largely on decline of Norfolk site.
593	410	Mammal	<i>Lepus europaeus</i>	Brown Hare	Cannot be assessed	Cannot be assessed	Local	Cannot be assessed	Assessment limited by lack of figures.
602	428	Mammal	<i>Lutra lutra</i>	Otter	Local	Cannot be assessed	High	Local	No population figures calculated.

Regional ID code	UK ID code	Group	BAP name	Common Name	Decline criteria	Resource criteria	Confidence criteria	Overall assessment	Available information
611	462	Mammal	<i>Muscardinus avellanarius</i>	Dormouse	Cannot be assessed	Cannot be assessed	High	Cannot be assessed	Assessment limited by lack of figures.
632	514	Mammal	<i>Phocoena phocoena</i>	Harbour Porpoise	Cannot be assessed	Cannot be assessed	Cannot be assessed	Cannot be assessed	Appears to be no available information.
634	519	Mammal	<i>Pipistrellus pipistrellus</i>	Pipistrelle Bat	Cannot be assessed	Cannot be assessed	Local	Cannot be assessed	Population information not calculated.
646	551	Mammal	<i>Rhinolophus hipposideros</i>	Lesser Horseshoe Bat	Cannot be assessed	Local	Local	Local	Information is accurate
650	565	Mammal	<i>Sciurus vulgaris</i>	Red Squirrel	Extinction likely	Local	Local	Local	Information is accurate
511	99	Mollusc	<i>Anisus vorticulus</i>	Ramshorn snail	Cannot be assessed	Major	Cannot be assessed	Major	Decline not recorded quantitatively
639	534	Mollusc	<i>Pseudanodonta complanata</i>	Depressed River Mussel	Cannot be assessed	High	Cannot be assessed	High	Decline not recorded quantitatively
652	570	Mollusc	<i>Segmentina nitida</i>	Shining ram's-horn snail	Cannot be assessed	Major	Cannot be assessed	Major	Decline not recorded quantitatively
670	626	Mollusc	<i>Vertigo angustior</i>	Narrow-mouthed whorl snail	Cannot be assessed	High	Cannot be assessed	High	Decline not recorded quantitatively; could now be stable?
671	629	Mollusc	<i>Vertigo moulinsiana</i>	Desmoulin's whorl snail	Cannot be assessed	High	Cannot be assessed	High	Decline not recorded quantitatively
574	348	Moss	<i>Hamatocaulis vernicosus</i>	Slender Green Feather-moss	Cannot be assessed	Cannot be assessed	Local	Cannot be assessed	
592	408	Moss	<i>Leptodontium gemmascens</i>	Thatch Moss	Cannot be assessed	Cannot be assessed	Cannot be assessed	Cannot be assessed	
587	390	Moth	<i>Idaea ochrata cantata</i>	Bright Wave	Cannot be assessed	Local	Local	Cannot be assessed	Decline not recorded quantitatively
615	471	Sea anemone	<i>Nematostella vectensis</i>	Starlet Sea Anemone	Local	High	High	High	Some recent surveys undertaken
556	267	Spider	<i>Dolomedes plantarius</i>	Fen Raft Spider	High	High	Major	Major	Subject of on-going research and action
564	293	Spider	<i>Euophrys browningi</i>	Jumping spider	High	Critical	Local	Critical	

Regional ID code	UK ID code	Group	BAP name	Common Name	Decline criteria	Resource criteria	Confidence criteria	Overall assessment	Available information
545	206	Stonewort	<i>Chara baltica</i>	Baltic Stonewort	High	Major	High	Major	Recent improvements in water quality has resulted in reappearance, but still unstable
546	207	Stonewort	<i>Chara canescens</i>	Bearded Stonewort	Major	Critical	Major	Critical	This is relative - possibly only moderate optimism as reintroductions have been unsuccessful.
661	608	Stonewort	<i>Tolypella intricata</i>	Tassel Stonewort	Cannot be assessed	Cannot be assessed	Local	Cannot be assessed	
584	379	True Bug	<i>Hydrometra gracilentia</i>	Lesser Water Measurer	Local	High	Local	High	In need of survey work to determine status
623	490	True Bug	<i>Orthotylus rubidus</i>	Plant bug	Local	High	Local	High	In need of survey work to determine status
506	83	Vascular Plant	<i>Alisma gramineum</i>	Ribbon-leaved Water-plantain	Cannot be assessed	Local	Local	Local	Species first discovered in UK in 1920. Inconspicuous plant which is easily overlooked. Suggested that E. Anglian populations may be derived from seed carried by wildfowl from Europe.
515	106	Vascular Plant	<i>Arabis glabra</i>	Tower Mustard	Local	Local	Local	Local	
542	198	Vascular Plant	<i>Centaurea cyanus</i>	Cornflower	Local	Local	High	High	
566	303	Vascular Plant	<i>Filago lutescens</i>	Red-tipped Cudweed	Local	Local	High	High	
595	415	Vascular Plant	<i>Liparis loeselii</i>	Fen Orchid	Cannot be assessed	Local	Local	Local	
601	427	Vascular Plant	<i>Luronium natans</i>	Floating Water Plantain	Cannot be assessed	Local	Local	Local	
614	470	Vascular Plant	<i>Najas marina</i>	Holly-leaved Naiad	Cannot be assessed	Local	Local	Local	Current populations are thought to be stable
633	518	Vascular Plant	<i>Pilularia globulifera</i>	Pillwort	Cannot be assessed	Local	Local	Local	
638	529	Vascular Plant	<i>Potamogeton compressus</i>	Grass-wrack Pondweed	Cannot be assessed	Local	Local	Local	

Regional ID code	UK ID code	Group	BAP name	Common Name	Decline criteria	Resource criteria	Confidence criteria	Overall assessment	Available information
649	561	Vascular Plant	<i>Scandix pecten-veneris</i>	Shepherd's Needle	Cannot be assessed	Cannot be assessed	Local	Local	Populations in Suffolk can be fairly abundant
653	575	Vascular Plant	<i>Silene gallica</i>	Small-flowered Catchfly	Cannot be assessed	Local	Local	Local	
654	577	Vascular Plant	<i>Sium latifolium</i>	Greater Water Parsnip	Cannot be assessed	Local	Local	Local	
664	612	Vascular Plant	<i>Torilis arvensis</i>	Spreading Hedge Parsley	High	Local	Local	High	Occurs in 20 tetrads throughout East Anglia
669	625	Vascular Plant	<i>Valerianella ramosa</i>	Broad-Fruited Corn Salad	Cannot be assessed	Local	Local	Local	Population at single site in Bedfordshire varies considerably from year to year
710	201	Wasp	<i>Cerceris quadricincta</i>		Major	Major	Cannot be assessed	Critical	Possibly under recorded
543	202	Wasp	<i>Cerceris quinquefasciata</i>	a Solitary Wasp	Cannot be assessed	High	High	High	Decline not recorded quantitatively
579	365	Worm	<i>Hirudo medicinalis</i>	Medicinal Leech	Local	Local	Local	Local	Extinct

PART 6 : References and glossary

Source documents used for compiling BAP lists

Title	Document type	Source of document	County Name	Date Received
Bedfordshire and Luton Biodiversity Action Plan: Summary list of species	Word doc	Michelle Edwards	Bedfordshire	20/03/02
Cambridgeshire BAP Implementation Programme in Cambridgeshire and Peterborough	Excel doc	Claire Ferry	Cambridgeshire	15/03/02
Monitoring Report for Cambridgeshire	Word doc	Claire Ferry	Cambridgeshire	15/03/02
Essex Biodiversity Action Plan	Excel doc	Bev McClean	Essex	13/03/02
Herts and Middlesex Wildlife Trust: Nature Reserves Section. Biodiversity Action Plan: Report March 2002	Hard copy	Nick Michael	Hertfordshire	15/03/02
Norfolk Biodiversity Action Plan : National Priority Species in Norfolk	Word doc	Paul Wilkinson	Norfolk	11/03/02
Norfolk Biodiversity Action Plan : Priority Habitats Found in Norfolk	Excel doc	Paul Wilkinson	Norfolk	11/03/02
UPDATE PROFORMAv5 filled in for Suffolk LBAP.xls	Excel doc	Rachel Hoskin	Suffolk	21/03/02
Appendices 1-3: Suffolk Biodiversity Action Plan Countryside.htm	html doc	Rachel Hoskin	Suffolk	21/03/02
Bedfordshire and Luton Biodiversity Action Plan	Hard copy	Michelle Edwards	Bedfordshire	04/04/02

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Glossary

Definitions for terms used in the text are presented in Table 26 : Definitions used in text.

Table 26 : Definitions used in text

Action plans in the UK	Three types of Action Plans have been developed which set priorities for nationally important and locally important habitats and wildlife : Species Action Plans, Habitat Action Plans and Local Biodiversity Action Plans
BAP broad and key habitats	As defined in 'Biodiversity : The UK Steering Group Report'
BAP priority species	Encompasses BAP short and middle list species
Broad Habitat Statements	Provide summary descriptions of all habitats found within the UK and are identified in the Broad Habitat Classification, for example, natural habitat types such as broadleaved woodlands and rivers and streams, through to urban settings. In addition to a general description of the habitat type these Statements identify the current issues affecting the habitat and the broad policies which can be put in place to address these
'Grouped' Species Action Plans	Have also been produced where a range of common policies and actions are required for a number of similar species, for example marine turtles or commercial fish
Habitat Action Plans	Provide more detailed descriptions for 45 specific types of habitats such as native pine woodlands, upland oakwoods and lowland wood pasture and parkland. They set out detailed actions that can be taken by a number of agencies in order to safeguard and enhance these habitats
Local Action Plans	A significant number of local BAPs are now in existence and their primary purpose is to focus resources by means of local partnerships to implement conservation action for the priority habitats and species and locally important wildlife and sites. The content of the LBAPs are informed and guided by national targets so that their implementation is firmly linked to national priorities. However, the plans should seek to reflect the values of local people and provide a focus for local initiatives
Reference Numbers	Unique number for the East of England allocated to each habitat and species.
Species Action Plans	Provide more detailed information on the threats facing 391 species and the opportunities for maintaining and enhancing their populations. Detailed actions are set out for a number of organisations to achieve the targets for these species