

81. Broadland

Geographical Coordinates:	52°43'N 1°31'W	Area:	3,350ha
Location:	A wetland complex in the valleys of the Yare, Bure, Ant and Thurne Rivers, east and northeast of the city of Norwich, in the county of Norfolk, eastern England.		
Date of Ramsar Designation:	21 September 1994		
Other International Designations:	European Union Special Protection Area		
National Designations:	National nature reserve ^P , Site of special scientific interest; Eutrophic sensitive area ^P		

Principal Features: Broadland is located within a large area of low-lying land in east Norfolk and northern Suffolk, including the lower valleys of the Waveney, Yare and Bure rivers and their tributaries. The region possesses extensive peatlands containing a series of shallow lakes created in medieval times following the excavation of peat for fuel. A subsequent rise in sea level caused flooding and the pits were abandoned. The succession of vegetation and various forms of traditional management have resulted in the large range of wetland habitats now present, including open water, reedbeds, fen meadow and carr woodland. In the lower river valleys, the extensive areas of alluvial soils are traditionally managed as wet grazing marsh. The diversity of wetland habitats supports an outstanding assemblage of breeding and wintering wetland bird species, as well as large numbers of rare plants and invertebrates. The following nine species of Red Data Book plants are found within the proposed Ramsar site: the stoneworts *Nitellopsis obtusa*, *Chara intermedia*, and *C. connivens*, the bryophyte *Ricciocarpus natans*, the moss *Cinclidium stygium*, the macrophytes *Naja marina*, *Liparis loeselii*, *Potamogeton acutifolius* and the fern *Dryopteris cristata*. Broadland's rich invertebrate fauna includes 136 Red Data Book species, reflecting the quality and diversity of wetland habitats present. The site is particularly notable for its dragonfly fauna, including the Red Data Book *Aeshna isosceles*, and as the only location in Britain where the endemic race of the butterfly *Papilio machaon britannicus* breeds successfully. The site also supports internationally important numbers of the following species of wintering wildfowl (figures are five year peak means for the period 1987/88 to 1991/92) *Cygnus columbianus bewickii* (495); *Anas penelope* (8,966), *A. strepera* (486), and *A. clypeata* (675). Notable also are nationally important numbers of the following breeding birds: *Botaurus stellaris*, *Anas strepera*, *A. querquedula*, *A. clypeata*, *Aythya ferina*, *Circus aeruginosus*, *Locustella luscinioides*, *Cettia cetti* and *Panurus biarmicus*. (Criteria 1a,2a,3c).

Conservation Issues: Land uses at the site include arable agriculture, grazing, flood control, livestock watering hole/pond, sewage treatment, industrial water supply, recreation and tourism. The National Rivers Authority (NRA) is promoting a flood alleviation strategy. There will be an effect on the brackish communities in the dykes due to the reduced water levels. This is addressed in the strategic Environmental Assessment which recognises that the habitat will be difficult to recreate (if not impossible). The NRA have recognised that bank strengthening could adversely affect those areas which

lie outside the existing flood defences and are investigating the implementation of the bank strengthening in addition to the provision of defences or other methods to ensure that those areas are not disadvantaged. A programme of phosphate stripping from sewage works effluents, combined with pumping of nutrient rich sediments from eutrophic Broad, isolation of the main river systems and 'biomanipulation' (principally the removal of fish which are predators of zooplankton) is in place in parts of Broadland. This seeks to restore the ecological character of open water bodies. Natural vegetation succession in the reedbeds, which has in the past been limited by regular reedcutting, has led to long term drying out and scrub development. Breeding *Botaurus stellaris* are now limited to two sites. Booming males have ceased to occur at four other sites in recent years. Reedbed 'quality' investigations by the Royal Society for the Protection of Birds (RSPB) have ascribed these losses to habitat change, principally through the drying of sites by succession. The RSPB has restorative measures in hand at the sites that it manages. Both the Norfolk Naturalists' Trust and the Broadland Authority also have reedbed restoration programmes in operation. A management plan for the Bure Marshes part of the site is being implemented by English Nature. As part of a fen management strategy, agreed between EN and the Broadland Authority, for the whole of Broadland, a ten year programme of "turf ponding" has been initiated. This involves the creation of shallow pools through the removal of a layer of peat, simulating the habitats created by traditional peat cutting. These show significantly increased species diversity and, more importantly, rare plants and communities are promoted.