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Analysing amenity and scientific problems: The Broadlands, England

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2.1 Introduction

The River Yare and its two major tributaries, the Waveney and the Bure, drain to the sea through Great Yarmouth in East Anglia (in the Eastern part of England). The low-lying land surrounding the tidal reaches of these rivers is known as Broadland, an area unlike any other in the country. Flat and low-lying, it contains a variety of landscapes and wetland habitats and supports a wide range of activities. Much of the area is devoted to agriculture but this co-exists with an extensive tourist industry, visitors being attracted by the opportunities offered for boating, walking, fishing and general sightseeing. The major town is Great Yarmouth, an active port and an important base for the offshore gas industry (National Rivers Authority, 1993).

This quotation encapsulates well the range of environmental values and economic activities that are to be found in the Broadland area. They undoubtedly represent a unique constellation in the context of the UK and are only rarely replicated amongst the wetlands of the rest of Europe. This chapter provides an in-depth study of Broadland in order to consider how conflicts of values and interests affect the definition of an environmental problem and the approach to its solution. The argument proceeds as follows.

First, the case study will be used to show how competing values and activities have evolved and to identify some of the principal environmental problems arising from *multiple land uses* in an area of extreme environmental sensitivity (section 2.2). Secondly, we will explore the conflict of interest between the private landowner, exercising his or her property rights, and the land user, including public bodies and recreational interests. In particular the conflicts and consequent negative environmental effects over water quality, water and river management and agriculture are discussed (section 2.3). This discussion leads to considering the attempt that has been made to mediate and resolve conflicts through the establishment of a Broads Authority

(section 2.4). The international dimension to the study of Broadland is then elaborated by articulating the kinds of value systems that are commonly present in the processes of *environmental mediation*, many of which extend beyond boundaries of the nation state. Here particular attention is given to the attempt to establish commonly agreed value systems and a holistic approach to both scientific conservation and landscape protection for amenity purposes (section 2.5).

2.2 Broadland – a case study

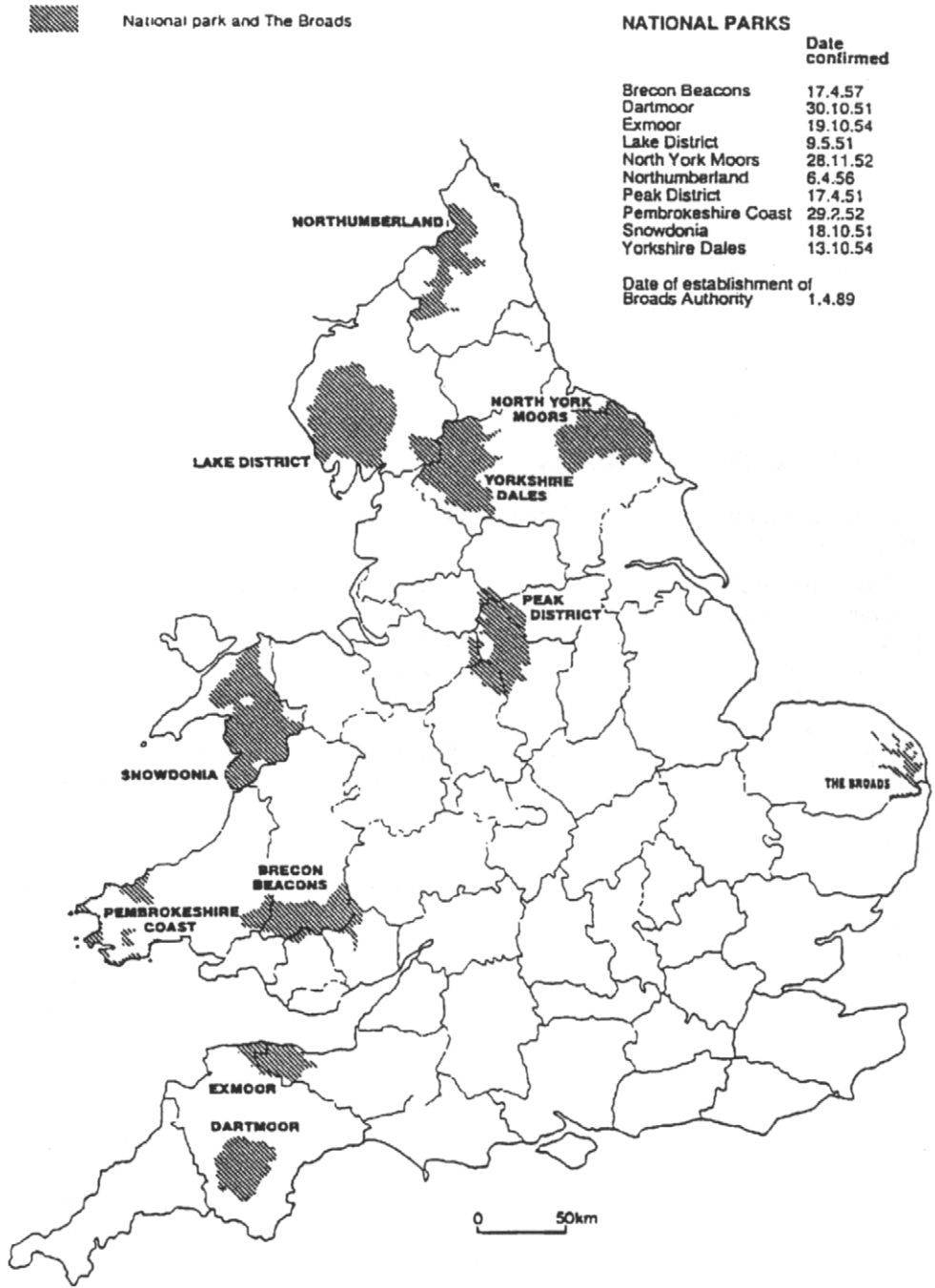
Historical context

As a flood plain, the area of Broadland (see Map 2.1) owes its unique environmental and ecological characteristics to medieval peat workings. During the 12th, 13th and 14th centuries, peat digging was a major industry. The workings became filled with water, thus creating an expanse of ‘broads’ – large areas of water and shallow lakes. As the broads themselves were cut by hand, so were the dykes needed for the purpose of transporting the reed harvest and sedge and marsh hay from the wet marshes. Also ditches were dug to drain the wet areas for grazing, later to be made all the more effective by the introduction of wind pumps. The whole water system became a trading network for the otherwise isolated villages in Broadland.

In this state, a crude equilibrium was achieved between the human demands made upon it, particularly in terms of large blocks of grazing marshes from which a thriving wool trade developed in the 16th century, and the maintenance of a particularly rich ecology. For centuries, the Broads were self-supporting, providing food, buildings and transport for people living and working in the area. From the beginning of this century, however, threats to this equilibrium emerged. In terms of human impact, the population has increased and farming has intensified. At the same time other interests have gained ground. Recreation and tourism, which began in the 1870s with the arrival of the railway in Broadland, have made the Broads a destination for thousands of people ironically seeking the freedom and tranquillity of some 200 kilometres of waterway. Fresh water supplies are threatened by both increasing demands, through new house building in Norfolk and Suffolk, and reductions in the supply of good quality water through the pollution of water courses by intensive economic activity. Nature, too, is providing its own threats through the global phenomenon of sea level change with a rising and stormy North Sea threatening to undermine everything that makes the Broads special.

Today, then, there are many conflicting value systems that place pressures on Broadland. Private economic and commercial aspirations in both agriculture and recreation are often at odds with more public desires for high quality ecological and amenity environments. These have been generated at the local, regional and even international level with the values of different user groups and landowning and water interests increasingly difficult to reconcile. Indeed, the most recent draft plan for the Broads (Broads Authority, 1993), in being entitled *No Easy Answers*, recognises the particularly acute nature of competing interests and value systems that operate within the area.

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Map 2.1 National parks in England and Wales

Amenity values

The landscape of Broadland, with its vast skies, open water, vivid colours and rich wildlife, provides a unique sense of place – a place of peace, remoteness and contact with nature. It is distinctive in its landscape features. The rivers wind slowly between embankments, high above open grazing marshes and waterlogged areas of pond weeds, rushes and alder known as *fens*. Windpumps, church towers, white sails on the waterways and areas of carr woodland, with their predominant stands of alder as well as sallow, osier and willow, all provide striking vertical features in an otherwise horizontal landscape. The evocation of these landscapes has been expressed by a number of local authors (Dymond, 1990; Malster, 1993).

In valuing such landscapes, certain descriptive taxonomies can be deployed, as Box 1 indicates.

A landscape taxonomy

The Broads Authority Landscape Group have classified the landscapes of the area into five principal types:

- 1 Broads that are fully enclosed by reed or alder carr providing short views opening out over small areas of grazing marsh.
- 2 Broads that are less enclosed offering a larger scale landscape but with a distinct valley form. Grazing marsh is dominant, but with occasional trees.
- 3 Open valleys that provide grazing marsh perspectives with views of villages on raised land, churches and windpumps.
- 4 Open flat landscapes offering large areas of water fringed with reeds.
- 5 Extensive open landscapes providing little open water, but large areas of grazing marsh, marsh gates, regulated dykes, birds and an immense sky.

Source: Broads Authority (1986)

But the overall *amenity values* of this area are greater than the sum of its landscape parts. They owe as much to cultures, local traditions and historical economic activity. The landscape has been fashioned by the working and living patterns of the people, exploiting the natural resources of the landscape for their own ends. Historically, fish and wildfowl provided a source of food, and reed and sedge, through thatching, gave them a roof over their heads. Marsh hay provided fodder for grazing cattle and the waterways were used for transporting goods. These economic and social activities, in turn, allowed wildlife and habitats to flourish. Much of the heritage of the area can be seen in the landscape today. The wherries that transported goods along the rivers may still be found alongside a great diversity of historic buildings which remain as the outward manifestations of the patterns of land ownership and economic activity of the past.

Amenity values are thus an intertwining of topographical characteristics, fauna and flora, and human tradition. Clearly, they are intrinsic public values, based as much on a sense of localness, resident culture and 'belonging' as on any more classifiable value

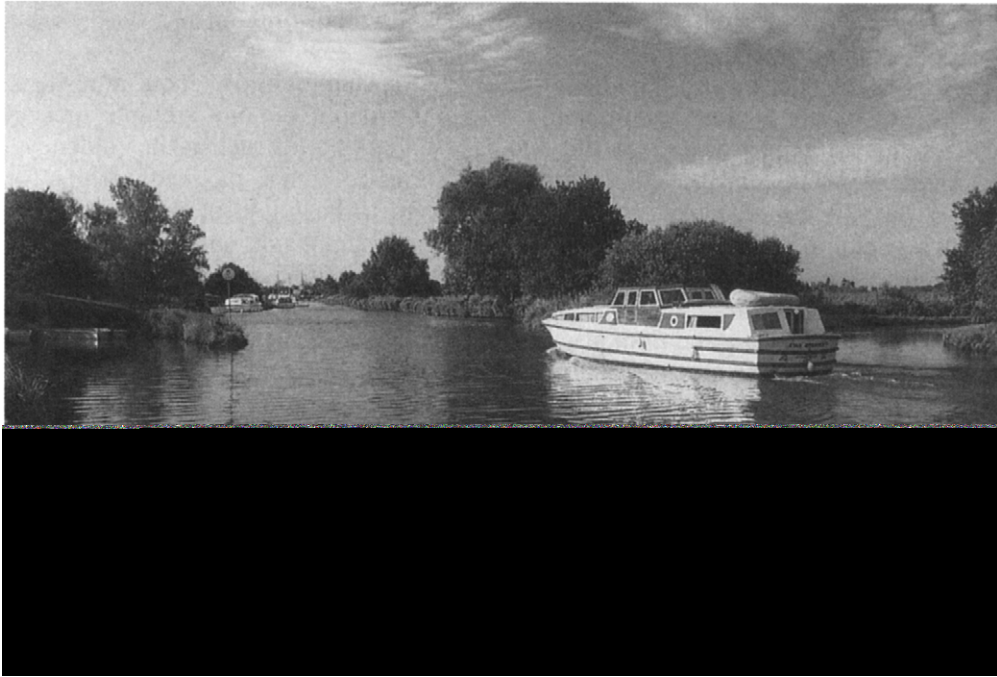


Plate 2.1 The River Ant, Norfolk. The Norfolk Broads are a unique region around a group of shallow lakes connected by a network of rivers. Photo: Mike Read/Ringwood

system. They are not represented through any market mechanisms (although they undoubtedly provide one of the core values of the leisure market) nor, of themselves, are they recognised through any statutory designation, local, national or international. Rather they are manifest through a sense of pride of place and 'ownership' of locality by the indigenous population, seen through a range of fond and nostalgic writings about cultures, customs and traditions (Calvert, 1993; Calvert and Calvert, 1992; Green, 1992).

The essential localness of amenity values has broadened to the wider population where it has been broadcast either through the landscape paintings of such as Turner and Sir Armesby Brown or more overtly through the positive marketing of Broadland as a leisure destination.

Nature conservation values

The Broads play host to many species of plant life that are fast disappearing from wetland habitats. This ecosystem provides essential sustenance and shelter for animal life. The fens alone contain over 250 plant species including the nationally protected fen orchid, the yellow loosestrife and the ragged robin. Aquatic plants too, such as the water soldier, the holly-leaved naiad, the hogwort and the bladderwort, do much to define the distinctiveness of the area. These plants provide scarce

breeding grounds for butterflies such as the swallowtail, dragonflies, the Norfolk hawk and damselflies.

The Broads also are well known for their diverse species of birds. Coots, moorhens, ducks, herons and grebes are commonly seen in the region, but more remote areas of open water are important for breeding and overwintering birds such as the goldeneye, teal, mallard, widgeon, shoveller and poachard. Species such as the reed warbler, the sedge warbler, bearded tits and reed buntings are to be found in contrast, in the reedswamp of the fens. In other areas on the drained marshlands, snipe, redshank and lapwing nest and find food, whilst oyster catchers may be found on marshland nearer the coast (Jones, 1985).

This variety of fauna and flora provides a series of public values in stark contrast to those generated by the amenity values of the area. Rather than being prized for their localness, for their values as heritage or unique sense of culture, these are values that have a more ubiquitous currency. The diversity of species within Broadland has led to values that have been recognised through nationally and internationally accepted designations.

Specific sites in the Broads, for example, Bure broads and marshes and Upper Thame broads and marshes, were designated in 1976 as *Ramsar sites* under the Convention on Wetlands of International Importance signed at Ramsar in Iran in 1971. This has established their worth according to an international value system representing, as they do, two of only 13 such sites in England and Wales.

Values of national currency also have been established through the designation of *Sites of Special Scientific Interest* (SSSIs) in the area. These are defined by English Nature, the successor body to the Nature Conservancy Council, under a continuous process which attempts to safeguard ecosystems of unique significance. Moreover, three *National Nature Reserves* (NNRs) at Hickling Broad, Bure Marshes and Ludham Marshes have also been declared because of their biological and physiographic importance in the national context. But in addition, those SSSIs that include Bure broads and marshes, the Ant broads and marshes, the Yare broads and marshes and the Upper Thame broads and marshes have been recommended by English Nature for further designation either as Ramsar sites or as Special Protection Areas under the 1979 European Directive on Birds, or both. Clearly, both international and European value systems are being proposed to establish the nature conservation worth of the region as being of more than just national significance.

In seeking to formalise national nature conservation values too, the Broads Authority (1993) considers some 80% of the grazing marshes to be of SSSI quality in respect of their marsh dyke communities.

Recreation values

If the public and cultural values of amenity and nature conservation are themselves very different – the former being based on the uniqueness of locality and the latter on the ecosystem values of an international currency – they are also overlaid by powerful market or commercial values generated by the two main industries of the area, tourism and agriculture. The historical importance of waterways in Broadland for trade has all but disappeared with waterways today almost exclusively used for leisure. This

principally takes the form of tourism with many people staying on the large number of hire boats in the area, as well as local hotels and bed and breakfast accommodation, but there are also considerable numbers of day trips from bases near Norwich and Great Yarmouth. The Broads attract in excess of 1 million visitors each year.

The unique drainage and river navigation system of the Broads is undoubtedly best experienced by boat. As one of Europe's most popular inland waterways, the Broads have the largest hire boat fleet of any waterway system in Europe and the private ownership of craft has grown considerably. In 1971 there were more than 10,000 boats registered on the Broads. By 1981 this had risen by more than 14% and by 1993 it had risen by a further 12%. This growth has spawned a large boat-building industry and a thriving export trade.

The 200 kilometres of safe waterways also allow ample opportunity for fishing and nature study. Land-based recreation is not extensively exploited although there is considerable scope for opening up more walks and rights of way since the wildlife and landscape interests accessible from the land are considerable.

All of this leisure activity adds up to a direct injection of between £20 and £30 million per annum into the local economy (Broads Authority, 1993), with ancillary industries generating economic activity that probably doubles this value. As well as expenditure on boat hire and accommodation, fishing licences and permits to fish generate considerable income. Indirectly, the boat-building and repair sectors, which alone have an estimated turnover in excess of £15 million per annum and employ over 1500 people, are supplemented by a large fishing tackle and bait industry. Indirect employment, too, is generated through the necessary employment of river bailiffs, ghillies and so on. In 1988, the Broads Hire Boat Federation estimated that between 5000 and 5500 jobs were in some way dependent upon the hire boat sector.

Recreation and tourism values are expressed in large part, then, by the operation of the free market with consumers demonstrating a willingness to pay through an established price structure. This market operation also generates *externalities*, impacts of market activity that are not fully accounted for in the price of commodities or in the processes of production (see also chapter 5). Not only are the externalities not fully internalised into the market (that is, recreators do not pay in full for the environmental change their activities cause) but they represent significant threats to the very different amenity and nature conservation values of Broadland.

As well as the monetary market values of leisure, there are hundreds of thousands of people every year who derive enormous pleasure from visiting the Broads. This pleasure represents further externalities, this time positive ones, to the leisure market, which economists have classified under the general term of *merit goods*. The spiritual and physical refreshment derived from a holiday in Broadland is rarely fully encapsulated in its market price. These intangible merit values derive again as much from the amenity and nature conservation values of the area as from its commercial infrastructure.

Agricultural values

The Broads historically have yielded a diverse harvest. Peat, reed and sedge, marsh hay for cattle, marsh litter for livestock bedding, wildfowl and fish for the table all provided

sustenance for the traditional marshmen in their hand to mouth existence. Today, the marshes and fens still rely on marshmen, some looking after more than 400 hectares of land. They are invariably employed in summer by landowners (although land has historically been and is still today owned in small parcels) and as well as having responsibilities for livestock, they are charged with many aspects of the drainage of the area – the maintenance of dyke levels, the operation of sluices, the recutting of foot drains and so on. Many are also employed by landowners to cut reed and sedge in season.

This pattern of agriculture, which characteristically is still broadly grazing marsh with a few pockets of arable land, has done much to define the amenity values of the area. But it has been continually facing pressures for modernisation. From the 13th and 14th centuries the draining of the marshes began to allow landowners to raise and fatten livestock. By the 17th century this had become widespread.

Accession to the European Community in 1974, however, brought about much more far-reaching changes. Guaranteed prices for cereals made arable farming a significantly more profitable enterprise. By the 1980s dairy quotas had forced many farmers in the Broads to reduce their herds. The result was that grassland was fast disappearing under the plough. Conversion to cereals was made even more attractive by high rates of drainage grants available during the 1970s.

By the early 1980s the grazing marshes, one of the principal landscape features of the Broads, were in danger of being substantially given over to wheat production. The infrastructure appropriate to the production of wheat (concrete roads, storage barns, overhead cabling for supplying power to grain dryers) and fertilisers and pesticides seeping into the dykes were radically affecting the central amenity and nature conservation values of Broadland.

Agricultural values are also thus composite ones. At the farm level, the landowners and marshmen are operating within a market structure to maximise farm incomes from food production. But, unlike leisure and tourism, they are operating within a market heavily managed by the Common Agricultural Policy (CAP). Price signals arise not from the free market but from European policy priorities. The means of production are driven by policies on farm input subsidies rather than the free market for inputs. These market signals driven now by policy also generate negative environmental externalities. The increased use of fertilisers and pesticides threatens the pollution of water courses, affecting water quality. The draining of the grazing marshes threatens to change the amenity value of the landscape beyond recognition and to impair much of the diversity of the wetland-based fauna and flora of the region. As the monetary returns from agriculture increase, the impacts on the landscape and ecosystems can be devastating.

Composite value systems in Broadland

The value systems of Broadland are complex. They can be considered in at least two different ways. Firstly, there are tensions between *market values* based on the ownership of land, capital goods and *private property rights*, personal values based on the uniqueness of place and public values based on more widely recognised notions of the quality of the environment. These are summarised in Table 2.1.

Market values	<p>Values from agricultural production based on the managed market</p> <p>Values from recreation and tourism based on the free market</p>
Personal values	<p>Amenity values based on custom and culture</p> <p>Physical and spiritual refreshment from recreation and tourism</p>
Public values	<p>Negative environmental externalities from agriculture</p> <p>Negative environmental externalities from recreation and tourism</p> <p>Nature conservation values</p>

Table 2.1 Types of values in Broadland

In addition, however, such values can be classified in terms of scale. Amenity and refreshment values derive very much from the locality. Broadland as a tourism resource and its nature conservation values represented through Sites of Special Scientific Interest and National Nature Reserves provide values of regional and national significance. Food output driven by the Common Agricultural Policy and the recognition of Special Protection Areas for birds are very much concerned with the imposition of a European value system. Sites designated under the Ramsar Convention, however, are more fully international. These are summarised in Table 2.2.

Local values	<p>Recreation values derived from spiritual and physical refreshment</p> <p>Amenity values derived from custom and culture</p>
Regional and national values	<p>Broadland as a tourism resource</p> <p>Nature conservation values recognised through SSSIs and National Nature Reserves</p>
European values	<p>Agricultural values driven by the market management of the Common Agricultural Policy</p> <p>Nature conservation values in Special Protection Areas under the European Commission Directive on Birds</p>
International values	<p>International wetlands under the Ramsar Convention</p>

Table 2.2 The scale of values in Broadland

2.3 Conflicts of interest

The interplay of these value systems inevitably, and in the case of Broadland critically, leads to *conflicts of interest*, where the activities of the market place in leisure, agriculture and indeed aquaculture, together with water abstraction and supply, severely threaten the more personal and public values of amenity and scientific conservation. This has led to a spiral of decline, well summarised by the Broads Authority (1993):

In many places, the water is murky where it should be clear; long stretches of river bank have lost their cushion of reeds; toxic blue-green algae outbreaks are more frequent, as are fish kills. Trees and scrub have invaded neglected fens threatening its rich wildlife and cutting off the breeze from sailing craft. And what more poignant symbol of misuse could there be than the prolonged absence of bittern, the talisman of the Broads.

In essence, these deleterious impacts of the market are caused by *negative externalities* which are no more stark than in their impacts on water quality and the consequent requirements for water and river management in Broadland.

Water quality

In 1982, a draft strategy and management plan, *What Future for Broadland?*, articulated clearly that the key to the future of Broadland was water quality. This quality had been declining over a number of years principally through the process of *eutrophication*, the fertilisation of the water through nutrient enrichment, mainly as a result of increasing amounts of phosphorus and nitrogen in the water.

The increasing amounts of phosphorus came in large part from sewage treatment works; the then regional water authority had seen the area as a principal destination for effluent disposal. This was a case of conflicts of interest coming from policies of the state, where one public policy objective – effluent disposal – was having significant detrimental effects on another – water quality – which itself was inhibiting the provision of potable water supplies, a responsibility of the same water authority. This situation was made worse by a degree of effluent disposal actually being imported into the area from a water authority that had a much larger catchment than that of just Broadland.

On occasion the overburdening of sewage arrangements led to a discharge of raw sewage into the waterways of the area. Even today, the discharge of domestic and industrial effluent is often considerable. Many water treatment works, which carry out primary and secondary treatment adequate for removing major pathological dangers such as disease organisms, are not equipped with tertiary treatment facilities for stripping or polishing nutrients from the treated water prior to discharge.

Phosphorus, too, came from the workings of the policy-driven market in agriculture, through the increasing amount of farm wastes that were generated by intensifying livestock production systems. Slurry, silage liquid, which is 200 times more polluting than domestic sewage, and other liquid wastes such as those from yard washing were

beginning to show significant pollution impacts. Silage liquid was also producing significant amounts of ammonia, which was directly toxic to fish.

This policy-driven market in agriculture was more significantly responsible for the contribution of nitrogen to the process of eutrophication. The favourable price regimes for the production of cereals led to the increased leaching of fertilisers and pesticides from treated soils to watercourses. The extent of this problem has resulted in the whole of the Broads catchment potentially being designated as a *vulnerable zone* under the recent *European Directive on Nitrates*.

This nutrient enrichment through increasing infusions of phosphates and nitrogen as a result of both market activity and public policy essentially causes the phytoplankton, microscopic algae, to become dominant, making it harder for larger aquatic plants to grow, particularly in the marsh dykes. In turn, without these plants, aquatic invertebrates, such as water snails and insects, are less common, which means less food for adult fish. Eutrophication has thus led to the impoverishment of natural fish stocks, but the loss of these larger aquatic plants, too, allows sediment to be more easily stirred up and then transported, causing increases in the rates of sedimentation. This requires increasingly expensive dredging if the silting up of open water is to be avoided. Siltation and sedimentation are often exacerbated by the drainage of certain acid peat soils, through intensive agricultural practices, that releases ochre into the dykes, rivers and broads.

By the time *What Future for Broadland?* had been produced, phosphate in domestic sewage, fertiliser run-off and indeed gull droppings had permeated the water to a point where only four of the 41 broads could support the traditional range of aquatic plants; 31 had lost virtually all of them. Nutrient enrichment had caused the water to become cloudy. By this process of eutrophication, the water lost its oxygen and the animal life supported by the plants was lost. Large numbers of fish died (MacEwen and MacEwen, 1987).

Eutrophication also has exacerbated the problem of bank erosion, through the loss of larger aquatic plants such as the rond, which had shielded the river banks against boat wash. The rivers were embanked hundreds of years ago and have been constantly under threat of erosion from wind, waves and tides. The operation of the private leisure market has compounded this. Water cruisers have made the problem worse and their wash now provides the main cause of erosion. Burrowing animals, bankside fishing, the unofficial mooring of water craft and dredging that removes river bed gradients also have made a significant contribution to the erosion of banks. Attempts to solve this problem have been less than satisfactory in terms of amenity values. The widespread introduction of piling, which is expensive, gives the banks a steep, linear, unvegetated canal-like appearance.

In addition to the significant pollution through phosphates, nitrogen and related infusions of ammonia and ochre, the use of lead for weights in fishing and shot in wildfowling, both associated with the leisure market, have caused significant lead poisoning to plants, invertebrates and animals. The leisure sector, too, has caused fuel pollution from boats both at times of filling and through spillage of diesel. The discharge of oily water through bilges is regulated within the hire fleets, but is more of a problem with private boats. Washing up water often causes foaming from unspent detergents.

Private industry generally was responsible for high levels of mercury being discharged into the watercourses of the Broads during the 1960s and 1970s. There are still

isolated high concentrations in the River Yare today. Dredging can stir up mercury compounds which can have serious consequences for wildlife. Finally, in respect of influences over water quality, the introduction – through fish farm escapees – of exotic species or different genetic strains of fish to receiving water can alter the species or genetic diversity of the natural fish stocks.

These conflicts of interest relating to water quality have been made more complex by the difficulty of attributing their causes to specific actors in the Broads and therefore securing agreement amongst them about the nature of the problem that could ultimately destroy nature conservation and amenity values. At times, since accession to the then European Economic Community, now European Union (EU), and the Common Agricultural Policy, farmers had been reluctant to recognise any real problem at all. The then Anglian Water Authority remained unconvinced about the detrimental impacts of high phosphorus emissions, despite research evidence to the contrary. As a result, it was reluctant to take expensive corrective action. The water authority, in defence of its position, identified the farmers as the real culprits of declining water quality, as a result of nitrogen run-off. The National Farmers' Union (NFU), whilst acceding to the nitrogen issue in part, identified the main problem, phosphorus pollution, as being the responsibility of the water authority. The situation was made worse, the NFU contended, by recreation interests, where motorised craft had created turbidity and had stirred up silts. Indeed, a strong contingent of NFU members on the North Norfolk District Council succeeded in the late 1970s in having boats temporarily banned from two broads for this reason, despite the fact that research evidence showed that boats had had little real impact on turbidity.

Water and river management

In addition to the problems of eutrophication, silting, bank erosion and damages caused by a range of other chemical pollutants, the Broads also suffer from two more fundamental water and river management problems. On the one hand, river flows have become lower and groundwater has become depleted. On the other, there is an ever present threat of increased saltwater incursion and flooding from the sea.

An adequate freshwater supply to the dyke systems and a high summer water table are essential for the maintenance of traditional grazing practices. Good river flows are also important in reducing phosphates. Water levels and flows must thus be maintained if the ecological quality, or nature conservation values of the area, are to be sustained.

A range of practices, again driven by market criteria and public policy goals, have severely threatened the sustainability. As the marshlands have been drained by more effective pumping and drainage technology to allow a more intensive cereals-based agriculture, changes in the water table have developed, with reduced run-off rates and flow regimes. Arterial drainage schemes and irrigation projects have often been brought about through large-scale channel and engineering works and all of this has been with the full support of the Common Agricultural Policy.

Water abstraction for public water supply and aquaculture from watercourses and boreholes tapping aquifer supplies has also led to changes in the natural flow of rivers and reductions in water table levels. Activities in agriculture and water supply have

Causes	Impacts					
	Amenity values	Nature Conservation values	Recreation values	Agricultural values	Industrial values	Aquaculture values
Amenity values						
Nature Conservation values						
Recreation values	1	2				
Agricultural values	3	4	5			
Industrial values		6				
Aquaculture values		7				

1. Bank erosion from wash from boats, bankside fishing and unofficial moorings
2. Lead pollution from fishing and shooting
Fuel and waste pollution from boats
3. Bank erosion from eutrophication
Drainage and irrigation works
4. Phosphorous generation from livestock wastes
Nitrogen generation from fertiliser and pesticide runoff
Drainage from acid peat soils releasing ochre
5. Ammonia from silage liquid impairing recreational fishing
6. Phosphorous generation from sewage treatment works leading to eutrophication
Mercury infusions from industry generally, stirred up by dredging
Water abstraction, lowering the water table
7. Nitrogen generation from fish farming
Introduction of exotic fish species

Fig 2.1 Conflicts of interest in water quality and river management within the value system in Broadland, generated through externalities

thus both served to impoverish the amenity and nature conservation values of the area. Much of the landscape has lost its traditional wetland character. Reductions in river flows have led to algae accumulation, again preventing the growth of water plants. Decrease in river flows also accentuates saline incursion into the freshwater ecosystem.

These saline incursions are made worse by a continuous threat of flooding from the sea which has periodically broken through the dunes along the coast since the 13th century. The coast between Winterton and Happisburgh is the most vulnerable, but is also the most protected. Flood alleviation will also entail the strengthening of river banks on over 200 km of river, where the river is higher than the surrounding land.

The resolution of river management conflicts suffers from the same problems as water quality. Various actors in the past have sought to identify the causes of the problems as being the responsibility of others. The Broads Hire Boat Federation, for

example, has been insistent that the impact of boats on bank erosion and silt stirring has been negligible. They have asserted that bank erosion has arisen mainly as a result of the trampling of river and broad banks by anglers and cattle. The economic value of the water-based leisure industry far outweighed any damage that boats might have caused.

The activities of the market place and of public policy can thus generate negative externalities that are often hard to attribute directly (in Broadland these are largely environmental in nature) which lead to significant conflicts of interest amongst the value systems inherent in the Broads. These are summarised in Figure 2.1. But the interests of private property rights are also notorious conflict generators and these have been particularly contentious in the agriculture sector.

Agriculture

With the increasing intensity of agriculture since the accession of the UK to the European Economic Community in 1973, traditional fen and marshland management practices were being used less and less. The fenland reeds were no longer cut for thatch and the fens themselves were no longer used for the cultivation of marsh hay. As a result, the scrub advanced and the fens receded. The interests of private property rights, invested in the farmer and landowner, were beginning to have a detrimental impact on both amenity and nature conservation values, essentially driven by European policy. Significantly, however, these rights extended to the control of internal drainage boards.

With this control, farmers had been seduced by drainage grants to introduce electric pumps to drain fields in hours that would have taken traditional wind pumps weeks. High subsidised cereals prices and the prospects of big profits were theirs if they could switch from traditional livestock grazing to cereals. It was this degree of subsidisation of agriculture that was to induce one of the most notorious agriculture-versus-conservation controversies in Britain in the 1980s.

The bigger expanding farmers in the area had a rational financial interest in the installation of more powerful pumps to lower the water table and facilitate conversion from livestock grazing to more subsidised cereals production. In one part of the Broads, the Halvergate marshes, it proved impossible to persuade farmers to desist from these proposals by negotiating a management agreement with compensation for foregone profits under the 1981 Wildlife and Countryside Act. Some of the more entrenched farmers had to be restrained from draining, as a temporary measure, with the use of an 'Article Four Direction' under UK town and country planning legislation, forbidding a drainage project. This direction was confirmed by the then Prime Minister, Margaret Thatcher, only after the Secretary of State for the Environment and the Minister of Agriculture had failed to agree on its invocation.

As an interim measure, however, the Direction had not resolved the basic dilemma. The Country Landowners' Association and the National Farmers' Union, together with the internal drainage boards, continued to press for compensation for not lowering the water table, at the local level. In fact, though, they were more representative of a small number of large arable farmers than the larger number of traditional marsh grazers in the area. This second group was worried that the intensification that might ensue would force them to sell up or move into cereals production. Instead they preferred continuing grazing in the traditional way, with some smaller payment as compensation for not

maximising output, for acting as custodians to tradition. It is clear here that the interest in private property rights amongst the largest farmers in the area, as well as creating negative environmental externalities, was creating conflicts not only amongst a number of actors in the mediation process but also within the farming community itself.

In the knowledge of this schism within agriculture, the Countryside Commission, with powers given it in another part of the Wildlife and Countryside Act, introduced an experimental conservation scheme, the Broads Grazing Marshes Conservation Scheme, between 1986 and 1988. This was administered and financed jointly by the Commission and the Ministry of Agriculture's advisory service. Payment at a flat rate of £120 per hectare per annum was made for farmers not to plough the Halvergate marshes, to maintain limits on stock numbers and nitrogen application and to take only one cut of silage a year. In short, they were to pursue traditional grazing practices in the marshes. Over 90% of farmers accepted these terms.

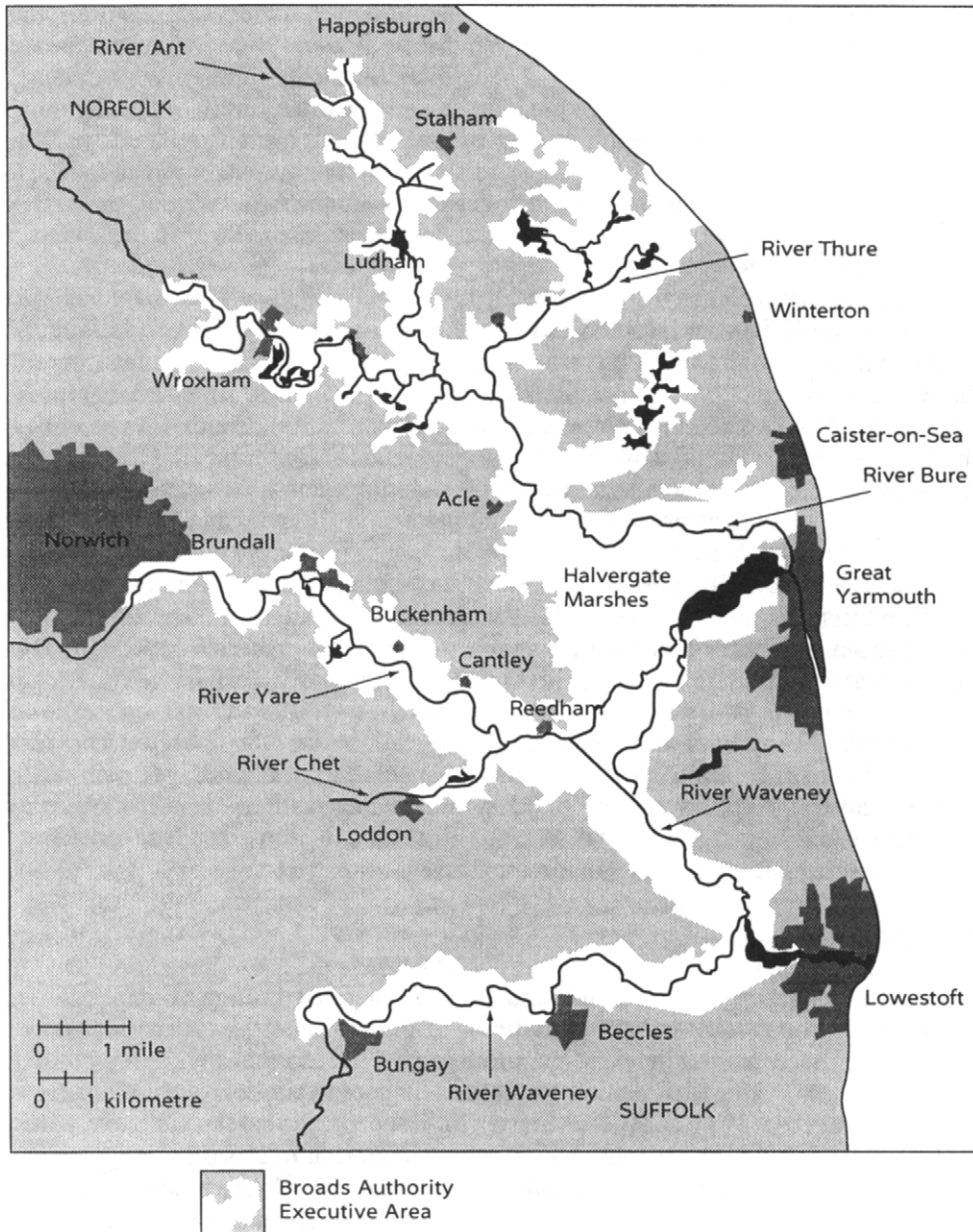
The scheme was to provide a blueprint for the introduction of *Environmentally Sensitive Areas* (ESAs) in England and Wales. In Broadland, the ESA is designed to ensure that landowners can derive a living from traditional marsh management. Through this system, the Grazing Marsh Conservation Scheme could be continued indefinitely. The Broadland ESA now covers about 16,250 hectares, some 90% of which by land area is covered by some form of agreement (see Map 2.2). Of this, about 32% is covered by the more environmentally friendly second tier agreement, where further rates of payment are made for eliminating fertiliser application and silage cutting altogether.

The mediation of ESA policy takes place through a Broads Agricultural Liaison Panel comprising representatives from the Broads Authority, farmers, landowners, internal drainage boards and the Ministry of Agriculture, Fisheries and Food. This panel played an important part in the review of the ESA, particularly since the Broads Authority under the Norfolk and Suffolk Broads Act of 1988 was given no direct powers to stop damaging farming and drainage operations directly. The review has led to a revised Broads ESA introduced in 1992 which enlarges its boundary to include the Wensum valley, the Bure valley between Aylesham and Saxthorpe and the Waveney valley between Bungham and Redgrave. Agreements have been extended from five to ten years, offering more security to farmers and wildlife alike.

The issues at stake

Overall, then, conflicts of interest in Broadland are generated through a complex series of interactions driven by market activities and public policies, which themselves generate negative externalities, and private interests in land that invariably conflict with more public values in relation to the sustenance of public goods. Conflict in activity is exacerbated by a conflict in relation to an acceptance of responsibility, which means that a purely objective approach to management solutions is often not possible.

Such management systems need to take into account not only the inherent values in Broadland but also the perceptions of those values by different actors. To the water company, the Broads are just a residual outlying part of a larger system for which they are responsible, to be used for effluent disposal. To boat hire companies, the Broads may be a seasonal profit-making system. To the conservationist the Broads constitute



Map 2.2 The Broads Authority Executive Area

a unique ecosystem or a prized landscape. To some farmers, the Broads may represent a profitable source of income, but to others the Broads may be part of a system for the perpetuation of land ownership from generation to generation, for the preservation of a particular way of life or for the maintenance of a particular social status. Clearly, such varying perceptions and the complex nature of value systems and environmental conflicts in Broadland pose a particular problem for the management of this unique wetland. And particular problems often necessitate special solutions.

2.4 Regulating conflicts

The Broads and national parks

By the mid-1970s, Broadland was facing a significant deterioration in scientific or nature conservation values caused mainly by water pollution both from domestic sewage and a whole variety of run-off wastes from the agricultural sector transmitted from a very large geographical area. In line with national trends, too, there had been a significant growth in the use of the waterways in pursuit of recreation values from the mid-1960s which, because they were largely unrestrained, were also causing severe environmental problems. The conflict between amenity, nature conservation, agricultural and recreation values was coming to a head.

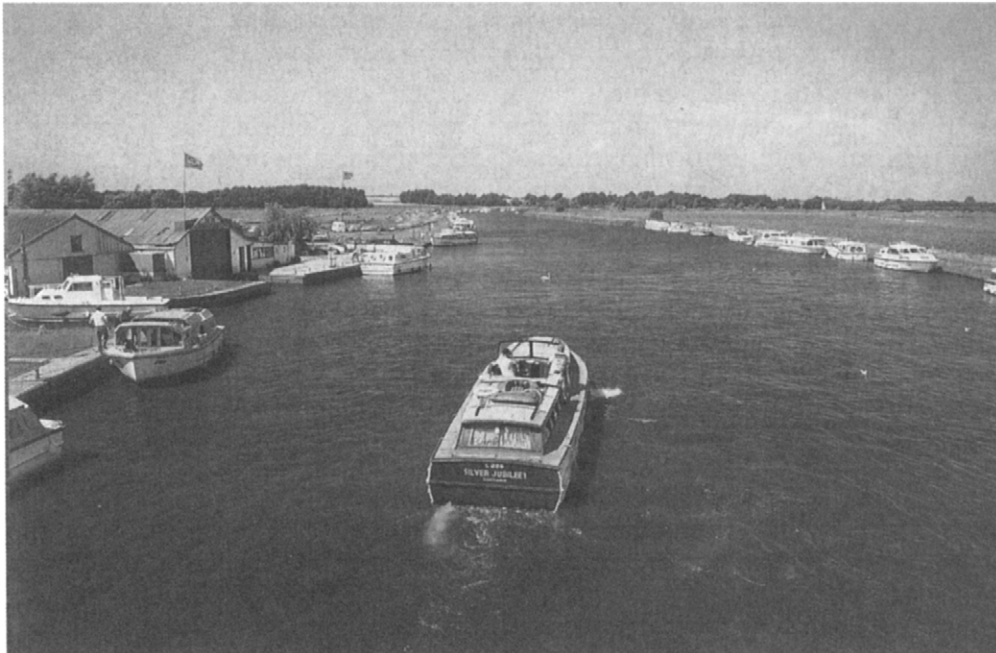


Plate 2.2 Pleasure boats on the River Bure near Acle, on the Norfolk Broads. Nature conservation and intensive water recreation are often at odds with each other. Photo: Mike Read/Ringwood

To a large degree in response to these problems, the then Countryside Commission for England and Wales, in 1976, proposed that the Broads should be designated as a national park. This was a controversial decision, since the national park system in England and Wales had not originally been conceived as a mechanism for crisis management. Rather, the administrative authorities of parks, certainly in terms of their conservation objectives, were seen as being passive, because farming and traditional land management would, allegedly, conserve the countryside (MacEwen and MacEwen, 1987).

The proposal to make the Broads a national park was not a new one. The Broads had figured in a 'reserve' list of national parks in 1945, when a report proposing the designation of parks was produced by John Dower. When the Hobhouse Committee recommended the specific location of parks in 1947, the Broads was again one of the 12 recommended. But the Broads were not included in the ten national parks designated between 1951 and 1957 chiefly because it was felt by many that the notion of a river and wetland park heavily used for boating and fishing did not fit well into Dower's original concept of wild and rugged open country. Even by the 1950s the Broads were considered to be too intensively used to be accorded national park status. By 1957, resistance to further designations had brought the general process of creating new parks to a halt.

By the mid-1970s, then, it was recognised by both the Countryside Commission and the then Nature Conservancy Council that their traditional remedies for the problems of the Broads, particularly in respect of a very intense cereals-based agriculture, were simply not powerful enough or met with strong local opposition. Even by the mid-1960s, a Nature Conservancy Council study of 1964 showed a surprising and worrying deterioration in the quality of the wetlands and their wildlife across the whole area of the Broads. But it was uncertain about how to resolve the problem since its traditional means of safeguard, particularly Sites of Special Scientific Interest and National Nature Reserves, were only site-specific. It had nothing in their armoury that would cover larger areas of the countryside or that could cover multiple land uses very effectively.

The Countryside Commission, on the other hand, could offer a solution to larger areas of countryside in the designation of a national park or an Area of Outstanding Natural Beauty, but these would not really allow any control over water management or water quality – the principal problems of the Broads – or over agriculture or land drainage – the principal causes of them. The two conservation agencies between them had no mechanisms that could resolve the problems at the right scale.

The Broads Authority

While not offering a very satisfactory solution, the proposal for a national park in 1976, then, was all that the Countryside Commission could offer. This was opposed immediately by the district councils in the area, since at that time, unlike county councils, they would have no representation on a national park authority under the traditional model for the administration of national parks. The districts instead proposed a joint planning committee of all local authorities in the area, on which the Countryside Commission and the water and navigation authorities would have

representation. This original idea for an informal 'Broads Authority', which was actually designed by the districts to frustrate the idea of a national park, was formally instituted in 1978. It was funded by the local authorities, the Countryside Commission and a small contribution from the water and navigation authorities. It operated, less powerfully than national parks, only through the delegated powers of the local authorities that were its members.

The success of this authority over the ensuing eight years, particularly in the areas of research, management and public relations, provided it with a strong case for autonomy, both in terms of planning powers and resources. The Countryside Commission concluded that this autonomy would in many ways provide a better mechanism for administering the area than a conventional national park. After some resistance on the part of the navigation authority, the Commission and the county councils, led by Norfolk, were successful in persuading the government that such an authority should come into being. The Norfolk and Suffolk Broads Act received Royal Assent in 1988, placing three main duties on the authority: conserving and enhancing the natural beauty of the Broads; promoting the enjoyment of the Broads by the public and protecting the interests of navigation.

The resultant, now statutory, Broads Authority has introduced a number of innovations in both research and management that distinguish it from the rest of the national parks in England and Wales. In administrative terms, however, it is a national park in all but name. It has the same autonomy in financial terms, as well as equal control over administration and policy. It is financed by a 75% grant from the National Park Supplementary Grant fund, with the balance of the money being met by constituent local authorities. In expenditure terms, this income funds a general account, nearly half of which is spent on conservation action. A separate navigation account is funded through income from tolls. Indeed, in terms of national park status within the Broadland area, the Farm Grant Notification Scheme, by which farmers in national parks have to notify grant-aided operations to national park authorities, has applied to the Broads since 1985 – three years before the inception of the Authority.

In terms of representation, the authority has a similar structure of members to a national park but with the addition of a much wider range of interests than other park authorities. These include boating, fishing, tourism and voluntary conservation representation, particularly on the Broads Authority Navigation Committee. Local authorities are thus represented on the Broads Authority as a whole together with the Countryside Commission, English Nature, the Great Yarmouth Port Authority, Anglian Water and the Secretary of State for the Environment.

The mediation process

In mediating the local, national and international values of Broadland, described in the first part of this chapter, a large number of interest groups have had a significant role to play within the overarching strategic responsibilities of the Broads Authority. Such groups have been instrumental in at least three distinct spheres. Firstly, in bringing about pressures for change, the Countryside Commission and the local authorities in the area, in particular, have had an important role to play in the establishment of the Broads Authority itself. National pressure groups, such as the Council for National Parks and the Council for the Protection of Rural England, have had a significant

influence on strategic developments, particularly in relation to exerting pressure on central government to switch resources from damaging land drainage schemes to providing positive support for traditional farming.

Secondly, interest groups have an important function in assisting with the ongoing management of Broadland in the context of measures developed to ameliorate the enduring conflicts in the area. In excess of 3500 worker days per annum are donated by volunteers, for example, in practical habitat management. The Norfolk Broads Conservation Volunteers, the Norfolk Naturalists' Trust, the Suffolk Wildlife Trust and the Broads Authority's own volunteer group, the Beavers, all receive grant aid from the Broads Authority and are co-ordinated through its employee conservation officers and riverside officers. The Royal Society for the Protection of Birds, too, has delegated management powers in areas such as the Berry Marshes Nature Reserve but also owns and manages its own land, for example the marshes at Cantley and Buckenham. This degree of voluntary involvement is not only cost effective, but provides an excellent means through which an understanding of, and sensitivity to, the different value systems of Broadland can be fostered.

Other voluntary groups concerned more directly with amenity values, such as the National Trust, the Norfolk Mills and Pumps Trust and the Wherry Trust, and recreation interests such as the Royal Yachting Association indulge in continuing dialogue with the Broads Authority and again often become involved in direct works.

Thirdly, a comprehensive web of consultation and liaison committees has evolved in an attempt to ensure that the strategic development of Broadland proceeds within a broad consensus of groups that individually hold very different values for the area. The Broads Consultative Committee provides a foundation for this, containing a wide range of interest groups that have an important input into strategic policy formulation. The Broads Authority also has set up an Agricultural Liaison Panel, with representation from farmers, landowners, internal drainage boards and the Ministry of Agriculture, a Broads Research Advisory Panel and a Water Recreation Liaison Panel, all of whom act as sounding boards for both policies and practice. Other independent bodies, such as the Broads Hire Boat Federation and the British Reed Growers Association, are consulted over more specific aspects of strategic development and invariably become involved with the Authority in individual management projects.

In addition to these interest groups, the unique administrative structure, in the UK context, for Broadland has been central to the process of mediation. The concerted efforts of the Countryside Commission and constituent local authorities have done much to bring this about and to make it work. To ameliorate the conflicts of interest within the area, the Broads Authority has undertaken a series of initiatives that provide a blend of existing legislation and policy and novel approaches to environmental solutions (see Table 2.3).

Indeed, as a unique wetland in the UK context, the Broads Authority actively looks to other areas with similar characteristics, particularly in Europe, for examples of good practice in the complex processes of wetland management, a theme to which we turn now.

Analysing amenity and scientific problems: The Broadlands, England

Instrument	Use	Comment
1. Direct action		
Key authorities	Broadland restoration	Broads Authority and National Rivers Authority acting in concert but involving English Nature and Countryside Commission plus voluntary groups through membership of Broads Authority
Research and experiment	For example, phosphate stripping, suction dredging, biomanipulation, bank erosion, boat design	Broads Authority has spent 10% of its budget over last decade in successful research collaborations with English Nature and University of East Anglia
2. Controls		
Legislation	Restoration through the 1988 Norfolk and Suffolk Broads Act; water regulation through the 1991 Water Resources Act; defining rights of way through the 1981 Wildlife and Countryside Act	1988 Norfolk and Suffolk Broads Act provides the basis for much of the present action in Broadland
Regulation	By-laws for boating standards	These cover safety, size, insurance, speed etc., and are policed by river inspectors
Licensing	Of boats to ensure environmental standards; of water abstraction to control water levels	Enacted by Broads Authority, boat licensing ensures craft are environmentally friendly
3. Land use planning and management		
Plans and strategies	Strategic plans from Norfolk and Suffolk counties; management plans (e.g. 'No Easy Answers', 1993) from Broads Authority, along with guidance on enhancement of landscape and buildings design; district and Broads Authority local plans detail the means of implementing the strategic plans - these are effected through development control	All plans go for public consultation and discussion and, once in place, provide a framework for action
Development control	Controlling new development, particularly in relation to recreation and tourism, and river usage	Exercised through granting or not of planning permission for holiday accommodation, moorings etc., and mediated by the Broads Authority local plan
Environmental Impact Assessment (EIA)	Examining the impacts of large scale developments or uses under EC Directive	EIA can be invoked by the planning authority and used to assess developments such as those for drainage or recreational carrying capacity
Land uses designations	Designation of Broads Authority area as a quasi-national park; ESAs; SSSIs; NNRs	These designations provide a tempering influence on developments which may affect landscape or nature conservation
Management strategies	For addressing particular management issues	E.g. Broads Authority and National Rivers Authority - control of discharges from acid peat soils; Broads Authority and English Nature - control of scrub invasion. Broads Authority - responsible for alder woodland management
4. Incentives		
Grant-aid	For a range of restoration and management measures	Used as an input to the Broadland restoration process in general and for ESAs in particular, these are provided by the EU. Broads Authority offers grants for the traditional management of carr woodland
Pricing	To encourage environmentally sensitive uses	Broads Authority operates different tolls e.g. lower for sailing craft than for motor boats
5. Information, education and advice		
Consultation and campaigns	To raise awareness about required action	Broads Authority and National Rivers Authority run consultation services in relation to grants; campaigns include those by Broads Authority and internal drainage boards to inform farmers about acceptable drainage practices
Information and interpretation	To provide an understanding of the complex web of the area's ecology and value systems	Exercised through the Broads Authority Information Centres and an education centre at How Hill, and by signposting public rights of way and navigable waterways

Table 2.3 Mediating environmental values

2.5 The international dimension

Nature conservation – the wider context

So far in this chapter emphasis has been laid on the particular example of Broadland. However, our examination of the different, often competing, interest groups and value systems that this has exposed in this area of Eastern England and the means by which a degree of resolution may be achieved in order to sustain the unique qualities of ecology and landscape has a resonance well beyond the United Kingdom.

To some extent this notion has already been touched upon in section 2.2 on nature conservation values. There we noted not only the recognition of many parts of the area as important within the national context as NNRs and SSSIs but some sites, in being recognised by the Ramsar Convention on Wetlands of International Importance, as having an international dimension. Although the Convention was not effected until the early 1970s, efforts to sustain sites of unique ecological importance worldwide have been backed by scientific communities in many developed countries since the Second World War. The experience of the UK is not untypical. During the passage through Parliament of the National Parks and Access to the Countryside Act 1949, those aspects touching upon scientific conservation, including the provision for SSSIs and NNRs, were largely uncontested. To a considerable extent this may be explained by the widespread deference to scientific expertise which was commonplace at the time and that, in attempting to conserve examples of unique ecosystems, the amount of land thus called upon to be ‘sterilised’ was relatively small (Blunden and Curry, 1989). It is easy to envisage such attitudes, largely divorced from any element of political controversy, being widespread in developed countries thus making international co-operation over the scientific issues, including ecological conservation, all the more likely. Indeed, the post-war period provides evidence of the growth of a plethora of international science-based conventions and councils, sometimes *ad hoc* (for example, the International Technical Conference for the Protection of Nature, held at Lake Success, New York in 1949), but more often than not with an ongoing remit and serviced by a secretariat. Examples here might include the International Union for the Protection of Birds or the Geosphere Biosphere Programme sponsored by the *International Council of Scientific Unions* (ICSU).

Recognising landscape values

Until comparatively recently attempts to conserve larger swathes of the countryside in the interests of maintaining landscape values have had, in contrast, a much more difficult time in the face of resistance from well-organised groups, such as farmers. Their broader economic interests in an approach to agriculture, which is often capital intensive, clearly runs counter to those who would espouse the cause of landscape conservation, a matter which calls for protection on a much greater scale. Attempts to bring pressure to bear in favour of conservationist objectives have rested largely upon the efforts of non-governmental organisations (NGOs), although in the case of England and Wales, the Countryside Commission has also been a key player.

Environmentally Sensitive Areas

Designated under the EC Structure Regulation 797/85, ESAs permit hectareage payments to be made for farming in ways which help to conserve landscape and habitat by resisting economic pressures for intensification. Their establishment introduced four important features into agricultural support:

- 1 a flexible means of protecting landscape, wildlife and archaeological features which can be integrated into agricultural practice;
- 2 income support measures which can be used to sustain traditional farm enterprise;
- 3 a limitation on the conversion of land to the production of high-yielding, food surplus-generating forms of activity;
- 4 general encouragement for low input/low output farming

(Blunden, 1987).

However, by the middle years of the 1980s, so far as the EC was concerned, it became only too apparent that widespread landscape destruction was an additional cost to that of producing highly priced food for which there was largely no market. Consequently, the notion of offering protection to larger areas of the countryside was realised. Here the Broads were important in pioneering the idea of offering financial support to farmers prepared to use extensive, traditional forms of agriculture practice, rather than aggressive forms of agribusiness based on monoculture and high levels of capital input as part of an intensive system. Since the ESA has now become part of The European Union framework for landscape protection it represents one important way in which the case study of Broadlands locks into an international context (see Box 2).

At the same time the Ramsar Convention, originally led by the concerns for scientific conservation, has moved on. When it was first established its emphasis was largely upon the idea of international co-operation in conserving key habitats for the survival of birds and other species, and the 'wise use of wetlands' to this end. However, the concept of 'wise use' seems to have been subjected to wider interpretation. Now there is a recognition of the 'need to relate indigenous uses of wetlands (not all of which are positive) to the wise use concept'. There is a realisation that 'the potentially damaging effect on wetlands caused by a higher density of human population and concomitant intensive use, whether in developed countries (reclamation, recreation) or in developing countries (over-exploitation)' underlines 'the urgent need for the zoning of activities' rather than total exclusion.

Although in the early years of Ramsar heavy stress was laid on international co-operation through the networking of common experience, it is no longer enough merely to foster more effective scientific knowledge of wetland functions and the protection of species and habitats in biosphere reserves. Today, the sharing of experience relating to both the scientific and the social scientific aspects of wetland management would appear to be germane (Marchand and Udo de Haes, 1991). This



Plate 2.3 Offshore industry close to the coast of Ameland, an island in the Dutch Wadden Sea. The Wadden Sea, off the Northern coast of The Netherlands, is an international wetland that is currently under threat from human activities. Photo: Michiel Cornelissen

brings Ramsar more into line with the approach of the *International Union for the Conservation of Nature and Natural Resources* (IUCN) to the designation of national parks as protected areas. While it maintains that these should contain central cores of wildscape where human intervention is minimal, these may be surrounded by 'harmonious landscapes' which have resulted from traditional patterns of land use (Simmons, 1989).

Wetland problems

However, those parts of the Broads recognised under Ramsar are merely fragments of an area for which holistic approaches to management are a necessity. Likewise the protection offered by ESA status has to be seen somewhat in the same light and cannot be considered as an all-embracing solution for landscape protection. In this respect the Broads are no different from other wetlands areas around the world. Indeed, for many of them, the problems posed by the diversity of interests which they contain remain largely divorced from any progress towards the achievement of management solutions. Examples abound from the developing as well as the developed world, especially where the activities of people whose traditional occupations have for centuries been in harmony with wetland ecologies are no longer so.

In India, for example, two wetlands, the Keoadeo Ghana National park near Agra and Lake Kolleru on the East coast, are the product of centuries of interaction between the rural populations and their environment in which a system of small-scale rice cultivation, grazing, fishing and duck farming had evolved and was maintained in a state of relative equilibrium. In recent decades, however, increasing population pressure and the desire for rapid economic growth have led to the over-exploitation and degradation of the wetlands. Attempts to counter these problems by the park authorities first involved eliminating the direct impact of the people on the wetlands – until it was realised that it was the complex interactive nature of the traditional local economies with their surrounding environment that conserved the area. Subsequent attempts to combine the conservation of biotic diversity and representative habitats in some areas and permit the maximum economic activity elsewhere have also proved disastrous (Gopal, 1990).

In the European context, the Camargue, located at the mouth of the Rhone in Southern France, is amongst the most famous wetlands. Because of the natural and amenity values of the area, several protective measures, largely based on scientific conservation, have been taken. These include the setting up of the Réserve Nationale de Camargue in 1928; the parc Naturel Régional in 1972; various departmental reserves; the Conservatoire du Littoral; UNESCO's Biosphere Reserve and the voluntary reserve of the Tour du Valet. But, in all, the total protected area is about 19,000 ha out of the 145,000 ha which constitutes the whole Camargue (some 13%). One characterisation of the area emphasises 'the subtle interpenetration of its distinct biotopes both in terms of space and time in a rather unpredictable way. From a scientific as well as an aesthetic point of view these patterns are predominant and from this the myth of the Camargue as a wild paradise has been born'.

However, it would seem that current realities are undermining such a picture since distinct social groups of users (into which the residents and tourists may be divided) are independently exploiting the potentialities of the area according to their respective value systems. Although a modest degree of conciliation between these groups has been attempted, each sector continues to pursue its own profit-motivated objectives in a largely uncontrolled fashion and to such an extent that deterioration is rapid. As in the Broadland area, support policies which have underpinned the agricultural sector, coupled with other forms of private market activity, often of a recreational kind, have generated environmental externalities which have affected those large areas not enjoying any form of protection. Certainly, no attempt has been made to try to address a common, legally binding framework of action that might conserve the Camargue with its specific natural and cultural characteristics in the interests of all. Nor, indeed, has any attempt been made to find 'new perspectives in terms of co-operation', perhaps, as has been suggested, through 'education and human interrelations rather than administrative rules and structures' (Tamisier, 1991).

Holistic approaches to management

The emphasis on personal interrelationships and the creation of better levels of understanding between contesting interest groups as a means of achieving holistic and effective management, which the Carmargue example discusses, is not new and has been the subject of work carried out in relation to Broadland in the mid-1980s. This aimed at improving understanding between the different interest groups or actors with their attendant values. It would be achieved through interactive sessions in which each of the different interest groups defined the nature of the Broads from their own perspective, thus promoting a learning process for all concerned and leading not just to more understanding between them and therefore reasoned debate, but also a diminishing potential for conflict (Blunden, 1987). Such an approach was advocated before the setting up of the Broads Authority with its aggregation of top-down powers aimed at achieving much the same end, if in a rather different way.

The problems of conflict resolution in wetland areas have more recently been addressed by others, this time in a more abstract context but based on wide empirical experience. They underline the key problems which may result from a multiplicity of players where 'it is very unlikely that all the actors regard all necessary measures (in the formulation of integrated management objectives) as equally urgent or seek solutions in the same direction'. In such a situation it is suggested that a *project approach* may provide the best route to harmonious integrated management. This involves not only a clear distinction between what is called *the problem field* and *the management field in relation to the problem field* (see Box 3), but as in Blunden (1987) and Glasbergen and Klijn (1991), it recognises wetlands are recognised as complex interactive systems in which the players view the nature, extent and purposes of the system in quite different ways. The last mentioned authors, however, discuss a more formalised approach leading to an integrated management plan. Having collected a total database for the area, the project approach then elaborates overall objectives in which these should be made 'specific for the various interests', at the same time paying attention to their interdependence. As the project approach facilitates the establishment of priorities, interventions are made explicit in the integrated management plan as this is a prerequisite for achieving the necessary co-operation.

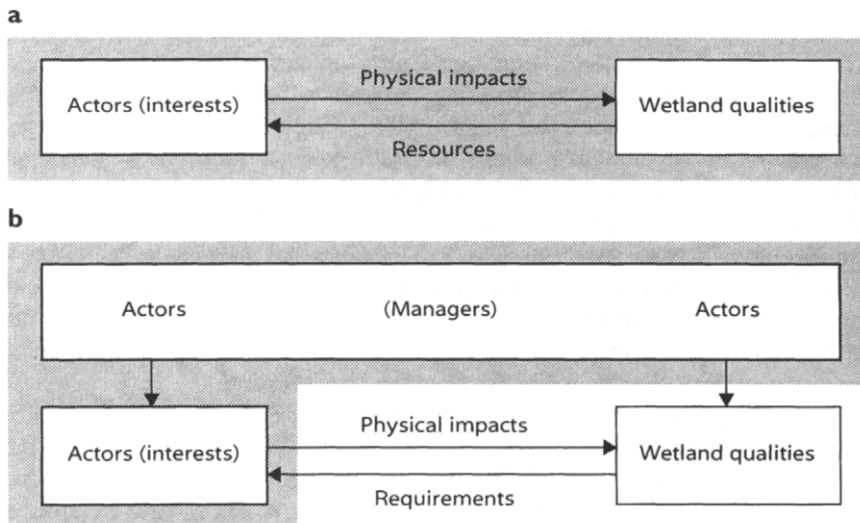
European co-operation

From the evidence so far, it is clear enough that designating an area as a wetland and complying with the recommendations of the Ramsar Convention is not a sufficient conservation measure of itself. Whilst Ramsar now acknowledges the need to do more than conserve species and ecologies at a number of sites of modest size, it hardly suggests frameworks similar to those referred to above (Holistic Approaches to Management), within which the management complexities of a large wetland area might be tackled meaningfully.

Unfortunately within the European Union there is a notable absence of formal structures or, indeed, directives from the European Commission relating to wetland

Managing wetlands – an analytical framework

'The problem field is a coherent set of problems, in this case (a set of) discrepancies between actual wetland qualities and requirements as to its qualities. The latter are defined by those who have an interest in its resources: the interest groups. Often, the interest groups also affect the wetland by their use (exploitation). The interest groups may therefore be considered as actors. The mutual relation between interest groups and a wetland is shown in (a) below.



a The problem field

b The management field in relation to the problem field

Aside stands a second group of actors who have as a single objective the management of this mutual relation, and to ensure wise use of the wetland as a whole as in (b) above. They have no interest in the wetland qualities themselves, but a general responsibility for its management. The management field, now, comprises all the relevant actors and their interventions. Hence, both the actors with a specific management task (the managers) and those affecting the wetland by using its resources (the interest groups) are part of the management field.'

Source: Glasbergen and Klijn (1991).

management outside the *Habitats Directive* which deals only narrowly with endangered habitats or species. However, this has not meant that the Commission has had no role to play in this field. In the Mediterranean where wetlands are particularly under threat and few properly managed or protected, the Mediterranean Wetland Forum, which was formed in 1991, has established an action programme to begin to redress just these problems. Set in motion in 1993 and to last for three years, it uses grants from

the EU's Financial Investment for the Environment fund. Although enabling rather than prescriptive in its approach, the Forum will require further funding later in order to ensure that the proper foundation for the implementation of the conservation and management of these wetlands can be built upon. Indeed, it hopes to apply further finance in a time frame that will allow its programme to continue well into the next century.

In Europe, other forms of international co-operation to share knowledge and expertise exist. The Action Plan for Protected Areas in Europe, sponsored by the Federation of Nature and National Parks of Europe, is a broader forum for sharing common problems including, but not exclusively, those of wetlands. However, as its president states, 'such plans only provide a framework for future action. Inevitably it will be the individual and collective responsibility of those who manage these areas across Europe to identify ways of working together to meet the right mix of local, national and international objectives' (Clark, 1993). Such an approach can be seen to be most immediately in evidence where wetlands form a contiguous whole across national boundaries. The Wadden Sea area, which falls within the jurisdiction of Denmark, Germany and The Netherlands, is an excellent example of such co-operation. However, it is an approach which also brings this discussion full circle since it well describes the networking activities of the Broads Authority. Not only does the Authority sponsor occasional international workshops such as that held in the Broads in October 1992 on assessing and monitoring changes in wetlands parks and protected areas, but it also works closely with other wetland authorities.

Of particular importance here is Le Marais Audomarois Regional Park near Saint-Omer in the Nord-Pas de Calais region of France and de Weerribben National Park in the North-west of the province of Overijssel near the town of Steenwijk in The Netherlands. Both parks, like the Broads, originated as a result of peat extraction; all three offer a similar diversity of environments which provide habitats for a variety of wildlife and all have similar management problems caused by the different needs of a range of different groups. Close co-operation between them has been in evidence since 1989. However, in June 1993 they agreed to join the *European Natural Sites Twinning Programme* (EUROSITE) sponsored by the European Union. This should be helpful in facilitating in a formal context an exchange of staff and act as a means of sharing the expertise so far developed independently in such fields as water quality, woodland, grazing and visitor management, and information, interpretation and education. Box 4 details these benefits as seen from the point of view of the Broads Authority. Perhaps equally important is the fact that twinning, as an EU enabling device and in the absence of a policy framework, offers the opportunity to bid for research and development funding from Brussels.

2.6 Conclusion

In line with other wetland areas, particularly in Europe but also elsewhere, Broadland offers a variety of value systems that hold a different and varying currency amongst different users of the area. The influence of the private market and of public policy goals aimed at assisting productive outputs in both the agriculture and water sectors has been one of generating externalities, particularly negative environmental ones,

Benefits of site twinning

The Broads Authority recognises a number of advantages to be derived from twinning with the Audomarois and de Weerribben as part of the European Natural Site Twinning Programme:

- 1 It helps establish the importance of the Broads in the European context and the contribution the Authority has to make to wetland management. It assists in obtaining EC funding for its research and management programme.
- 2 It allows access to four working groups established within the Programme which cover topics relevant to the Broads and enables the Authority to draw on the collective experience of 33 sites in the EU.
- 3 It provides an exchange mechanism for staff and access to grants to facilitate this, thus offering an unrivalled opportunity for the transfer of information between sites, especially in the following areas:
 - water quality – a problem for all three sites extending beyond the water itself to the marginal communities which are declining and into adjacent fen vegetation where such problems as falling reed quality are manifest.
 - fen and carr woodland management – de Weerribben has a well-developed management programme for these habitats. Its experience in the management of reedbeds and marsh hay meadows is particularly relevant to the Broads.
- 4 Grazing marsh management – large areas of Audomarois and parts of de Weerribben are under grazing marsh. Their management of these for birds and the resolution of pollution problems in the dyke systems offers useful guidance to Authority staff.
- 5 Visitor management – there is much to be learned from the Dutch on 'green tourism' and the recreational management of park areas. Canoe trails, nature trails and the management of visitors arriving by all methods of transport are well established in de Weerribben.
- 6 Information, interpretation and education – both de Weerribben and Audomarois have interesting visitor centres using a range of interpretative techniques. On-site interpretation is also being developed at both. Environmental education programmes are well established in both areas using specialist personnel.

Source: Broads Authority memorandum, September 1989.

that have severely compromised such value systems and have generated a range of land-use-based and particularly water-based conflicts. This situation has been exacerbated by difficulties in unequivocally attributing, if not identifying, the principal causes of environmental deterioration in the area.

These environmental problems have led to attempts at conflict resolution in the British context. The Broads Authority evolved into statutory status through a process of organisational and pressure group lobbying, first for national park status but subsequently for an organisational form that matches the problems of the area even more appropriately than a national park might have done, particularly in respect of research and experiment. Within this organisational structure, the full panoply of

environmental mediation instruments has been deployed. The traditional demarcations, in Britain at least, between land use planners and resource planners have been set aside to allow the full range of direct action, plan making, development controls, economic controls, land use designations and information and advice to be harnessed together in pursuit of the common goal of environmental quality. And the integrative role of the Broads Authority, in assuming a range of delegated powers from local authorities and statutory powers from Parliament, has provided a means of exploiting such instruments.

Similar approaches have been advocated certainly in the context of the wetland areas to be found within the EU. This is because, as in the case of the Broads, many similar pressures resulting from the claims of the market and the landowners to pursue economic goals continue to pose problems of reconciliation with the needs of biological and amenity conservation. This in spite of the argument put forward by some that the diminishing emphasis placed on the EU's Common Agricultural Policy, which requires drastic reductions in production subsidies for farm crops, could assist in ameliorating some of the negative externalities of intensive agriculture.

However, the fact remains that statutory approaches to environmental conservation remain largely concerned with ecology and the protection of habitat and are applied inside the EU on a small scale, as is the concept of the ESA. Co-ordinated attempts to deal with these on a broader scale and within a wider interest group framework, which includes landscape protection, remain central to the national frameworks most countries offer for the administration of their national parks. However, in these parks the problems are generally less complex across a wide range of locations. Indeed, out of the 31 national parks outside the UK but in the EU as at the beginning of 1994, only one, the Tablas de Daimiel in La Mancha, Spain, is a wetland. But even this is very small at just under 2000 hectares. For wetlands the fine balance between the interests of the market and environmental objectives is undoubtedly much more difficult to achieve. Notwithstanding the financial support given by the European Commission for *ad hoc* voluntary co-operative initiatives of an enabling kind, the Commission has seemed singularly reluctant to involve itself in positively evolving a mandatory integrated management framework suitable for wetlands.