

3 An Evaluation of Wetland Policy in England and Wales

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Introduction

Landscape assessment and related research in Britain has always been controversial. Much British landscape research in the 1960s and 1970s focused on attempts to derive universally applicable field-survey or map-based assessment and evaluation systems (Lowenthal, 1978; Penning-RowSELL, 1981a). Many of these approaches have now lost favor with both researchers and land-use planners. The assessment systems devised have been seen as either insufficiently sensitive to local needs, particular problems, and special landscapes, or as of questionable validity. As a result, there has been a move away from qualitative assessments of landscapes toward attempts at quantitative character assessment—in which the components of the landscape are recorded without aesthetic judgments (Welsh Office, 1980)—and toward a greater understanding of the public's attachment to valued landscapes (Dunn, 1976; Penning-RowSELL et al., 1977; Shoard, 1978).

Linking visual and cultural aspects of landscape has not been common in Britain. Economic historians such as Beresford (1954) and Hoskins (1955) have stressed cultural aspects

of landscape evolution, and geographers such as Lowenthal and Prince (1964, 1965) and Appleton (1975) have clearly identified the cultural associations involved in landscape appreciation. Planners have taken a more pragmatic approach, with simplistic attempts to measure the aesthetic value of conserved landscapes (Clark, 1968; Fines, 1968), although landscape architects such as Fairbrother (1972) and Laurie (Robinson et al., 1976) have certainly not ignored the fundamentally cultural context of landscape perception and appreciation.

The visual aspects of wetland areas in Britain have received remarkably little attention. In contrast, the cultural aspects have been extensively studied. The main thrust of such study has come from geographers and historians in attempts to illuminate the cultural history of areas that through technological innovation and the resulting agricultural development have changed markedly over the centuries. Many studies have documented the early draining of English marshlands (Darby, 1956; Parker and Pye, 1976; Williams, 1970), and few areas of the British landscape have received greater attention so far as their cultural landscape attributes are concerned.

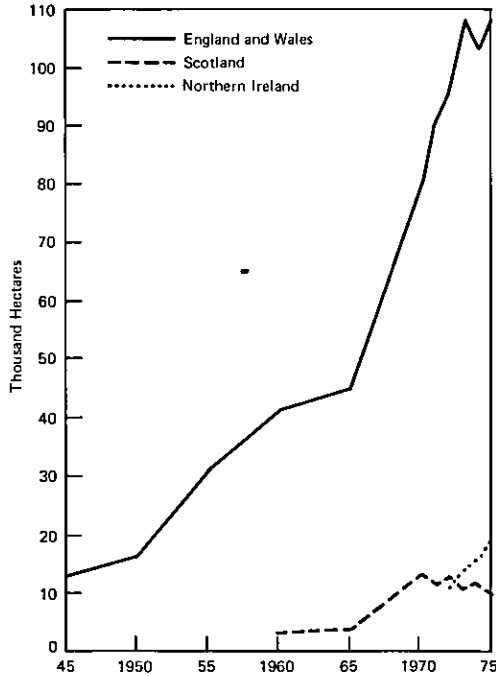


Figure 3.1. The increase in drainage area annually in Britain (Hollis, 1979).

Nevertheless, wetland areas are receiving greater attention from those concerned with landscape and nature conservation. The land-drainage program promoted by the Ministry of Agriculture, Fisheries, and Food has been an outstanding success; in virtually every year since 1945, an increased total area has been drained in order to promote higher agricultural productivity (Figure 3.1). As a result, many of the major wetland areas, such as the East Anglian Fens, the Somerset Levels, and the Pevensy Levels, have been partially drained. Minor wetland areas have been drained completely; thus the specialist fauna and flora that are characteristic of these habitats have become considerably rarer. Such trends have produced major conflicts between those concerned with nature conservation and those responsible for agricultural development, as the former attempt to limit the successes of the latter. The conflict is compounded by the lack of systematic data on the nature and extent of wetland habitats and landscapes. Little is known about the significance of wetland landscapes in comparison with other more widely known areas, such as national parks or Areas of Outstanding Natural Beauty. Further research is badly needed on the at-

tributes of major wetland landscapes to complement the existing volumes on their cultural history.

The Legal and Policy Framework in England and Wales

The legal framework surrounding the designation and use of wetlands is highly complex. Several major government agencies in Britain have responsibilities in the field, and their policies often conflict. Research into wetlands is similarly fragmented and sparse.

The main threat to current wetland landscapes comes from the pressures for agricultural intensification. The significant legislation in this area is the Land Drainage Act of 1930 and 1976. The historical background of this legislation shows a period of extreme agricultural depression in the 1920s, when much land capable of food production went out of use. The government intervened to set up, within an overall system of agricultural support, special Catchment Boards to oversee the drainage of most of England and Wales. Government grants were made available to these Boards and to individual farmers to drain their land. As Figure

3.1 shows, this process of farm drainage has continued unabated ever since, encouraged by a reduction of 50 percent in the real costs of drainage works (Cole, 1976; Parker and Penning-Rowell, 1980) through the mechanization of the necessary ditch and dike clearance (George, 1976), with hydraulic machinery replacing the traditional draglines.

The current organizations responsible for this drainage work are the land-drainage committees of the regional water authorities, set up under the Water Act of 1973 (Parker and Penning-Rowell, 1980). Because of the traditional rationale of land drainage in improving farming productivity, the central government's Ministry of Agriculture, Fisheries, and Food has a crucial role in the drainage field. Regional water authorities receive grants for land drainage of up to 85 percent of the capital costs of a scheme, and farmers also receive half of any capital costs they incur in their drainage work.

These grants are provided by the Ministry of Agriculture, Fisheries, and Food so long as the benefits of a scheme outweigh its costs. The cost-benefit exercise is vetted by Ministry officials who also review the schemes to ensure that certain design standards are met (Penning-Rowell and Chatterton, 1977). However, the Ministry does not assess the overall environmental impact of the schemes, which has been shown to be considerable (Hill, 1976), nor are any visual design standards established for the scheme construction itself or for the resulting landscape of the drainage area. Notes issued by the Ministry's Agricultural Development and Advisory Service (1974-77) give no guidelines on the visual impacts of drainage or on the potential effect of drainage on culturally important landscape elements such as buildings, ancient dikes, roadways, or field boundaries.

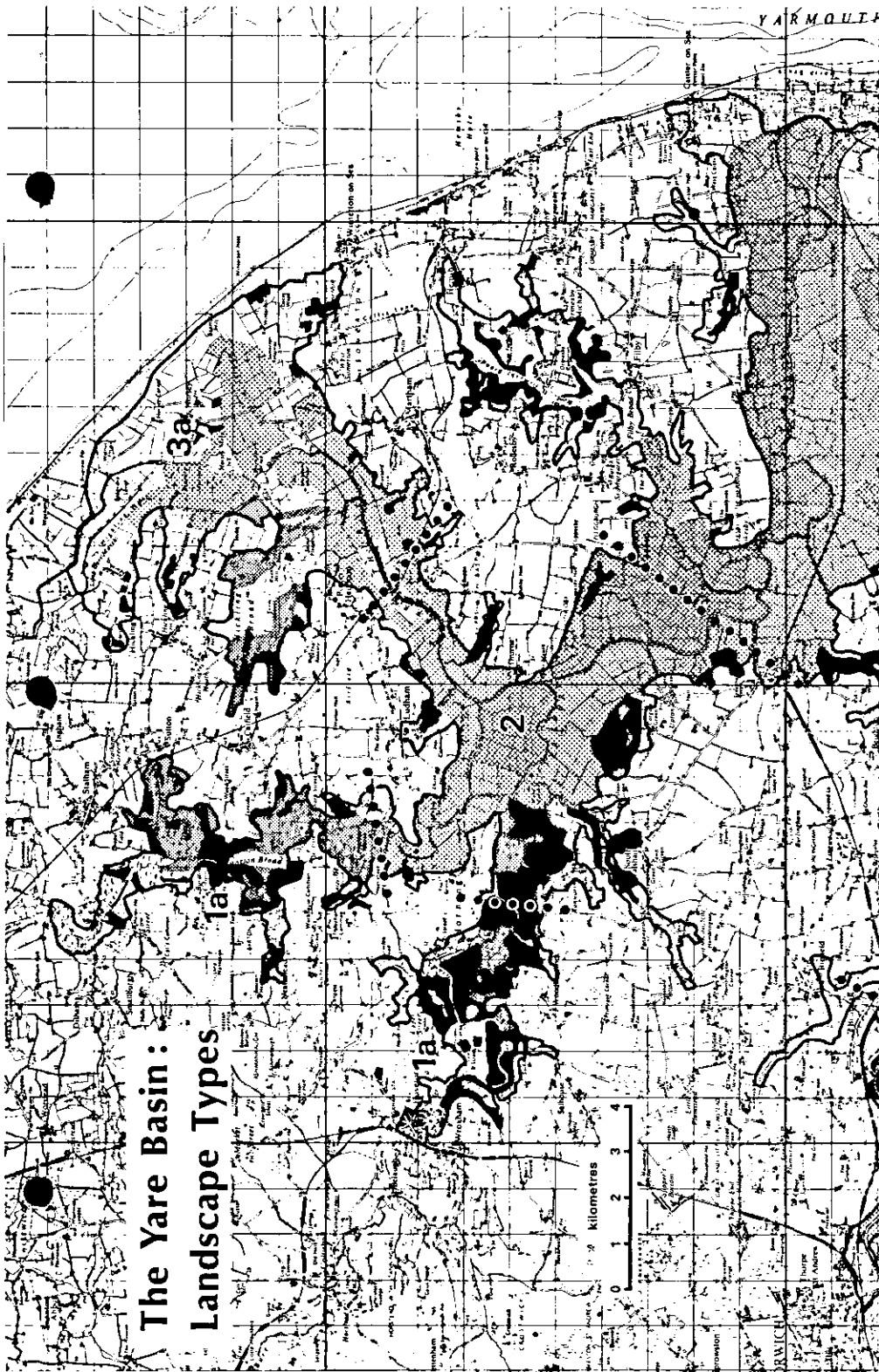
The land-drainage policy of the Ministry of Agriculture, Fisheries, and Food is part of a wider agricultural program to increase the level of British food self-sufficiency and so reduce the adverse balance of trade payments between Britain and the rest of the world. In addition to this economic rationale, there is a long-standing policy that greater self-sufficiency adds to the strategic strength of Britain, which has customarily depended upon importing approximately half of all its food. Therefore, increasing home food production has been considered in

the national interest (Ministry of Agriculture, Fisheries, and Food et al., 1979), and the maintenance of a strong and profitable home farming industry has been the resulting policy. Such a policy is supported by the government view that "the landscape which people are understandably keen to preserve would quickly deteriorate without a flourishing agriculture" (*ibid.*, p. 19).

The maintenance of this flourishing state is assisted largely through grants and subsidies or taxation policies, since within the Common Agricultural Policy framework of the European Economic Community the British government views the prices for certain agricultural products as already too high to use increased prices as a means of retaining profitable farming. Therefore, there are strong arguments within the government for the maintenance of the land-drainage program, which must necessarily reduce the area of British wetlands. In theory, every ministry has the obligation under Section II of the Countryside Act of 1968 to "have regard to" conserving the natural beauty and amenity of the countryside. Also, under the Water Act of 1973, a similar and more extensive duty is placed on water authorities to protect wildlife and other natural features. However, these statutory duties for having regard to conservation and landscape considerations are vague and have been ignored on many occasions in the past. Very little systematic study by land-use and water planners is undertaken into the environmental effects of their decisions, and even less consideration appears to be given to the visual influence of a declining wetland resource.

The main agency for wetland conservation in Britain is the Nature Conservancy Council, but also of major significance are the numerous local and national amenity and conservation societies operating on a volunteer basis. The Nature Conservancy Council designates Sites of Special Scientific Interest (SSSI) and National Nature Reserves under a policy of protecting wildlife in "key areas" of conservation interest (Nature Conservancy Council, 1974). In many instances, these policies lack teeth in that SSSI status does not prevent farmers from plowing the land so designated or of draining wetlands, since the ultimate land-use control rests with the landowner.

In National Nature Reserves there are greater powers, and many are owned by the Nature



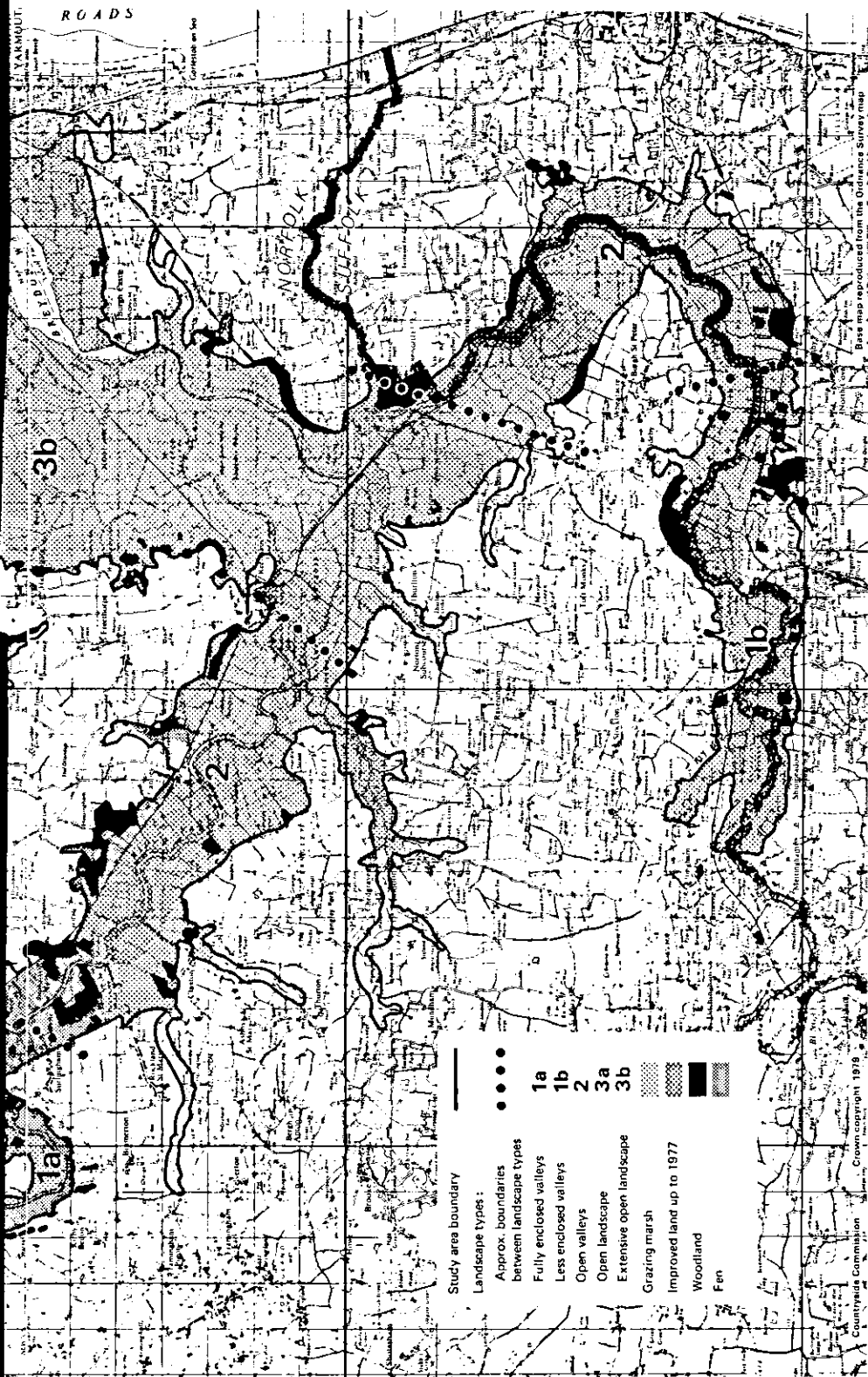


Figure 3.2. The Yare Basin: Landscape types.

Conservancy Council, but such reserves cover only 0.6 percent of Britain (Davidson and Wiberley, 1977). Local amenity societies and the Royal Society for the Protection of Birds both own and manage nature reserves, including key wetland sites, but their power and influence is limited despite substantial growth in membership over the last decade. The most powerful of these organizations are concerned with wildlife conservation, particularly birds, but the Council for the Protection of Rural England and the National Trust—with memberships of 30,000 and 1 million, respectively—have a keen concern for landscape conservation (Penning-Rowse, 1981b).

This brief analysis of the legal, financial, and political aspects of wetland conservation shows that the power clearly lies with the Ministry of Agriculture, Fisheries, and Food in its ability to pay grants to water authorities and landowners. These grants undoubtedly provide a strong incentive to landowners to improve the productivity of their wetlands. Statutory provisions for environmental and visual impact studies are nonexistent, although there are obligations and agreements between the Ministry and the Nature Conservancy Council for the former to consult the latter when grants are sought for draining SSSIs (George, 1976). Nevertheless, grants have been given in these circumstances, for draining part of the Somerset Levels, when the Ministry felt that agricultural productivity outweighed environmental and landscape considerations. However, no systematic study has been undertaken of the nature of British wetlands that could be used as a guide for such considerations; and there are many areas outside existing designations where landscape change is rapid and nature conservation value is being lost through drainage and other factors promoting land-use change.

Wetland Assessments: Methodology and Issues

Two examples of wetland landscape and environmental assessments reveal the problems and potentialities of such attempts to gauge the value of these complex environments. In both cases, the information on the visual, cultural, and nature conservation value of the wetland areas was collected to counterbalance the more

tangible economic evidence favoring agricultural intensification.

The first case includes a systematic study of the landscape of the Yare Basin (commonly known as the Norfolk Broads) and comprises an analysis of both the visual and the cultural landscape elements of this important wetland area (Land Use Consultants, 1978) (Figure 3.2). The second example details a public inquiry into drainage proposals for a significant wetland area at Amberley Wild Brooks in Sussex. Here, no such systematic study was undertaken, but evidence from a wide range of agencies and individuals gives useful insight into the visual and nature conservation values of the area. Both cases illustrate the many methodological and conceptual difficulties of assessing the significance of wetland landscapes.

The Yare Basin Landscape Study

Research by Land Use Consultants (1978) was commissioned by the Countryside Commission (a government agency within the Department of the Environment) to assess the landscape of the Yare Basin and the changes that might result from a flood-control scheme proposed by the Anglian Water Authority. The scheme is designed to prevent flooding from the sea, which is increasingly likely as aging flood-control banks become less capable of withstanding tidal surges.

The Yare Basin (Figure 3.2) comprises the valleys of the rivers Bure, Yare, and Waveney and their tributaries. The area includes navigable waterways, open broads (lakes), reed fens, fen woodlands, reclaimed grazing marshland, and some cultivated arable land. In the west and north, the rivers are narrow, but they open out gradually toward the sea and join in the central area to form a large expanse of open marshland. Much of the valley flood plain lies below the level of the rivers and has to be drained by pumping.

In the eleventh century A.D. and before, the area was a vast reed swamp and unreclaimed marsh that had been deforested. Peat digging was practiced extensively in the twelfth century A.D. and the open Broads are now believed to be peat excavations that were flooded in the thirteenth and fourteenth centuries A.D. For centuries vast expanses of marshland remained, but

inroads were gradually made, and with the use of wind pumps and subsequently steam pumps the majority of the area was drained to form the existing grazing marshes. Much of the area is still prone to winter flooding, which keeps agricultural productivity at a low level and largely prevents arable cultivation.

Some 2,800 hectares remain undrained, predominantly in the north in the vicinity of the Broads. These have remained as open water and reed swamp, although natural vegetational colonization has resulted in a complex mosaic including fen carr and fen woodland. For many years traditional management for the production of reeds, sedge, and alder poles restricted the development of natural woodland; but decline in the management system has meant that woodland has increased and open water has been lost to reed and sedge beds. The agricultural use of the open marshland has slowly intensified, but it remains based on livestock production from summer grazing. The area is subject to intense recreational pressure; in 1971, 260,000 holidays were spent in the Broadland area (Broads Consortium Committee, 1971).

The assessment methodology adopted by Land Use Consultants involved four distinct stages (Figure 3.3), designed to produce an evaluation of the impact of the flood-control scheme on the character-defining landscape elements of the area. Six major groups of elements were defined, comprising aspects of landform, sky, water, vegetation, animals, and human artifacts.

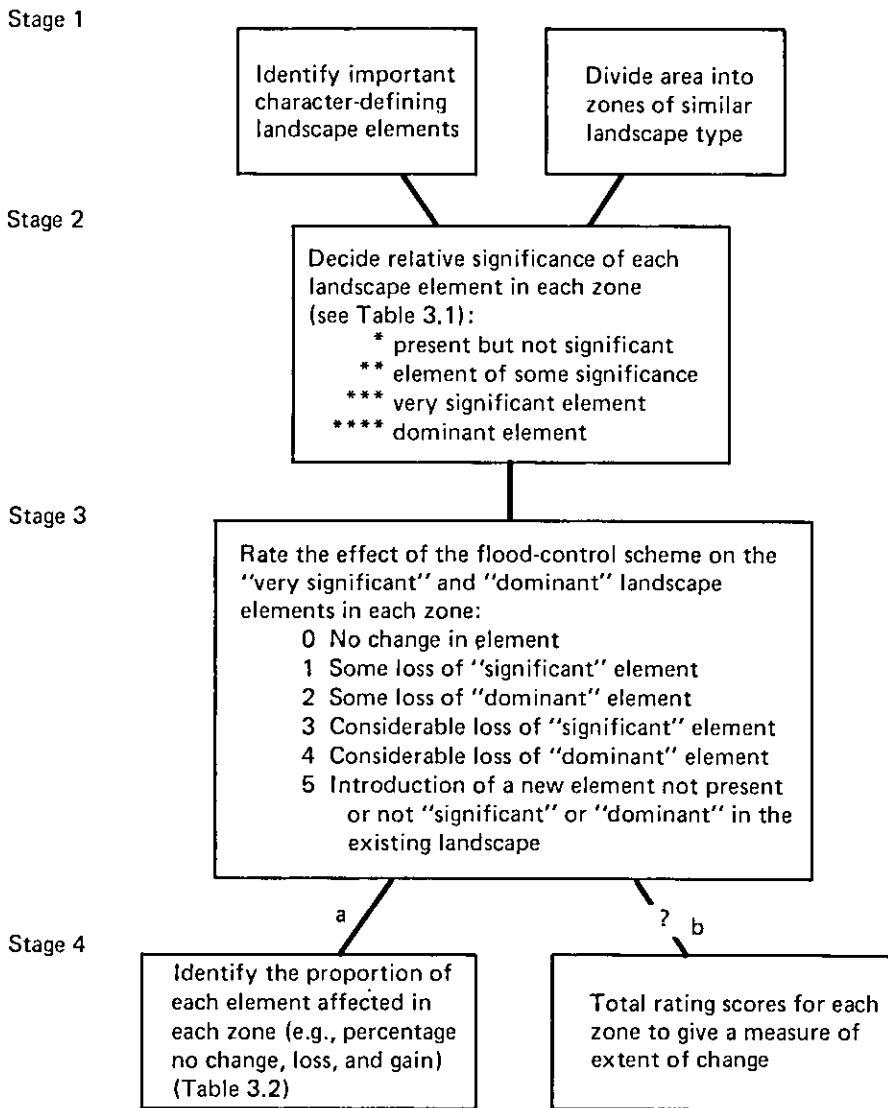
The significant aspects of *landform* identified were the flatness of the valley bottoms, the open, extensive plain of the central marshland, and the slight but important elevation of the surrounding low hills, which provide important visual contrast to the generally low-lying landscape. In such areas the sky assumes great importance and occupies a major part of any view. Variations in light and cloud forms throughout the day were considered important, exaggerated by the flatness of the plains and the areas of open water, "creating many subtle effects of shadow, highlight and reflection" (Land

Use Consultants, 1978, p. 4).^{*} The presence of water throughout the area, and therefore throughout the landscape, was seen to bring strong associations with the wetland nature of the area. In particular, the open waters of the Broads themselves are dominant, with a preponderance of "edge" effects where they meet the adjoining reed fen and woodland, "which must largely be responsible for their popularity with holiday-makers" (*ibid.*). In the southern area the rivers are prominent, with their elevated river banks, and the drainage dikes in the surrounding marshland break up the continuous expanse of grazing land.

The *vegetation* of the area has four important elements: woodland, trees, reed beds, and open grazing. In the upper reaches of the northern rivers the landscape is enclosed, mainly by fen woodland that has colonized the reed swamp. Elsewhere, the landscapes are open, but woodland is still an important element in the form of small but frequent areas of carr woodland on the peat soils that fringe large parts of the river valleys. Here there is an appearance of dense woodland, even though the areas in question are generally small, owing to the contrast with the open marshland and flat valley bottoms. Similarly, the incidence of trees outside the woodland areas is low; but where there are lines or clumps planted in association with dikes or rivers, they provide "important incidents in the open landscape" (*ibid.*, p. 5). The tree species in both open valleys and woodland areas have strong wetland associations, being usually willow, alder, or poplar.

Reed beds form important margins to the open water of the Broads and fringe the rivers and fen woodland of the northern areas. The tall reeds emphasize the lines of the drainage dikes, and "apart from their visual significance to the landscape, these areas [of reeds] are important as habitats for birds, and in their contribution of sound through continuous movement of reeds in the winds" (*ibid.*, p. 5). Away from the woodlands and the reedbeds, which in area are quite small, the *open marshes* are "the most characteristic feature of the landscape" (*ibid.*, p. 5). Their visual appearance depends on their

^{*}This section describing those landscape elements identified as important by Land Use Consultants (1978) draws heavily upon its report. Quotations are followed by page references (4), but other sections here paraphrase the text and are intended to show which landscape elements were identified for particular attention.



Source: Land Use Consultants, 1979.

Figure 3.3. Stages in the assessment of the Yare Basin landscape (compiled from methodology used by Land Use Consultants, 1978).

state of agricultural management, but generally the rough, tussocky mixture of rush, thistle, and other "weed" species give a strong image of the wetland character of the area. When these areas are drained and converted to arable cropping or ley grassland, "the link with the wetland environment is lost" (*ibid.*, p. 5).

The *animals* grazing on the marshland provide important interest within the extensive vistas of permanent grass through their movement, numbers, and contrast in color. Movement and interest is also provided by birds and wildfowl, which are present in large numbers throughout the area. Land Use Consultants appears doubtful whether these are "strictly definable as a landscape element," although it suggests that the wildlife of the area is an important part of the whole environment: "The attractiveness of the area is just as much dependent on its natural flora and fauna and physical features as is the scientific interest" (*ibid.*, p. 6).

Special consideration is given to *human artifacts*. Of greatest significance are those features that through their elevation about the surrounding flat areas form prominent landmarks within the sea of grazing. Ancient windmills, church towers, steam-pump chimneys, and traditional gates are singled out for favorable mention, while electricity pylons and holiday-industry developments are seen as intrusive elements. Where elevated above the general flatness, both roads and railways are prominent, especially where they are raised to cross rivers or dikes. "Traditionally, boats have been an important part of the landscape. The sailing wherries (barges) form the unique spectacle for the land-based observer of disembodied sails passing across meadows, with the water invisible below" (*ibid.*, p. 6). The large number of holiday boats in the area feature strongly in its landscape character.

From such analyses Land Use Consultants identifies the major landscape elements and their significance within the different landscape zones (Table 3.1; Figures 3.2 and 3.3). This significance is judged intuitively on a four-point rating scale (Figure 3.3), and those elements that are judged as "very significant" or "dominant" are then rated on a further scale to identify the effect of the flood-control scheme. As can be seen from the scale in Figure 3.3 (Stage 3),

primary importance is accorded to new features of the landscape as a result of this scheme, such as new agricultural buildings, further electricity supply lines, pumping stations, and arable cultivation. A final stage in the methodology enumerates those landscape elements that would experience no change, those that would be lost, and those that would be gained within each landscape zone (Table 3.2). While the approach adopted by Land Use Consultants does not total the rated scores (Figure 3.3, Stage 4b), this is implicit in the scoring methodology and gives a measure of the extent of landscape change within the different areas based on the ratings of the different visual features listed in Table 3.1.

The method of landscape assessment is notable in recognizing the significance of human artifacts to the landscape character and quality of the area. As such, this survey follows a long tradition of assessments of the Broadland area, from the Hobhouse Report (1947) and the Broadland Study and Plan (Broadland Consortium, 1971). Artists and writers have also recognized the significance of human artifacts within the landscape, and Land Use Consultants uses this material to complement its quantitative assessment. However, the sources of information on which the assessments are made of the importance of features to the landscape are not unambiguous; few of the policy papers of local and national planning agencies are explicit about the exact nature of the landscape character on which great value is placed, although "there is every indication that the typical open marshland landscape . . . forms a major part of the image of the Broads" (*ibid.*, p. 21). Also, surveys of residents and visitors indicate that only between 6 percent and 18 percent considered the scenery to be a major attraction. Nevertheless, the researchers attached great importance to the apparent consensus across a wide range of information, including their own survey, that the existing features of the landscape were highly valued and that agricultural intensification would have an adverse effect on the visual and cultural attributes of the Yare Basin.

The assessment methodology, however, can easily be criticized. How decisions were made labeling some elements as "very significant" and

Table 3.1 Major Character-Defining Landscape Elements and Their Significance in the Main Landscape Zones of the Yare Basin, Britain

Landscape Element	Landscape Types				
	1A Fully enclosed valley	1B Less- enclosed valley	2 Open valley	3A Open	3B Extensive, open
<i>Physical Elements</i>					
Sky	**	**	***	****	****
Flat flood plain	*	**	***	****	****
Enclosing uplands	**	****	***	**	*
Open broads	****	—	—	***	*
Cuts and drainage dikes	**	***	***	****	****
Elevated river banks	*	***	****	*	****
<i>Natural Elements</i>					
Fen woodland	****	—	**	—	—
Fringing Carr woodland	*	****	****	**	*
Reed fen	****	*	**	***	—
Reed beds, fringing river	**	**	****	*	***
Vegetation in dikes	*	***	***	****	***
Trees on marshland	*	****	**	****	***
Hedgerow trees on upland	*	***	****	*	*
Grazing marshes	*	****	***	***	****
Arable and ley fields	*	*	**	*	**
Grazing animals	*	**	***	***	****
Wildfowl and other birds	****	**	***	***	***
<i>Human Artifacts</i>					
Traditional gates to dike crossings	*	**	***	**	****
Farm buildings on marsh	—	*	*	—	—
Farm buildings on upland	*	*	***	*	*
Pumping stations	*	**	**	**	***
Farm access roads	—	**	**	*	*
Fencing	*	*	*	*	*
Villages	****	**	***	*	*
Pubs by river	***	*	**	*	*
Holiday and recreation centers	****	*	***	**	*
Roads	**	**	*	*	**
Railways	*	*	**	—	***
Boats	****	*	***	***	**
Bridges	**	**	*	—	*
Ferries	*	—	*	—	—
Churches on upland	*	**	***	***	*
Wind pumps	**	—	***	****	****
Pylons	—	***	—	—	***
Low power lines	*	**	***	**	***

Key: * = present but not significant element.
 ** = element of some significance.
 *** = very significant element.
 **** = dominant element.

Source: Land Use Consultants, *A landscape assessment of the Yare Basin flood control study proposals* (Countryside Commission Working Paper 13). Cheltenham, England, 1978.

some as "of some significance" is not clear. Why do all new features in the landscape receive high adverse scores? Indeed, why within their methodology is there a scoring system at all? The analysis that leads through to Table 3.2 gives all landscape elements equal weight, which must falsify their "true" relative significance. Nevertheless, such criticism is at least partially unfair; the report does not pretend that landscape is absolute and measurable in any easy way, and indeed the most credible "assessments" within the overall evaluation come from the surveys of people who know the area intimately, from the analysis of features commonly recorded by artists and writers, and from the continuity of agreement within planning reports about the uniqueness of the landscapes of the area. However, such criticisms would be valid if the area were unknown; who then would be able to extol its virtues? In these circumstances, then, perhaps just such a simple evaluation technique might be useful in identifying the potential threats to an important wetland, although it is not easy to see how a list of significant landscape features, such as those presented in Table 3.1, could then be devised for use in the assessment methodology.

The Amberley Wild Brooks Inquiry

Controversy concerning drainage proposals for the Yare Basin has continued (O'Riordan, 1981) with the search for some compromise between drainage, nature conservation, and landscape protection. This search has involved establishing a special Broads Authority to plan the future use of the area in recognition of the national importance of this major wetland scenic resource. On a smaller scale, a similar conflict occurred between landscape and drainage interests over the future of a small but valuable wetland site in southern England, well away from the major traditional centers of drainage in the fenland countries of East Anglia.

In March 1978 a public inquiry was held in Arundel, Sussex, to look into a proposal by the Southern Water Authority to install a pumped drainage scheme that would improve the agricultural productivity of the 365-hectare wetland area on the River Arun known as Amberley Wild Brooks. This inquiry was signifi-

cant in that it was the first public examination of a land-drainage scheme under the new Land Drainage Act of 1976, which in itself was the first legislation providing for public inquiries into drainage schemes. The Brooks form part of an Area of Outstanding Natural Beauty, designated by the Countryside Commission, and comprise a shallow, flat area surrounded by the chalk hills of the South Downs. The land use is mixed, with areas of marsh, bog, and fen together with rough grazing supporting beef cattle during summer months. The area is completely flooded during most winters and is waterlogged for many months each year. The drainage proposal was designed to prevent flooding more than once every five years and so permit increased stocking of the grazing areas and some limited extension of arable cropping (Parker and Penning-Rowse, 1980; Penning-Rowse, 1978; Penning-Rowse and Chatterton, 1977). Within Britain, inland wetlands of the size of Amberley Wild Brooks are rare, and by Smardon's criteria (1975, 1979), the wetland would be considered an exceptional natural area with general landscape values (Smardon, 1979). In addition, there are species of dragonflies that are known to breed only in the acid peat bog area of the Brooks, and the area is of international importance as a site for wildfowl, including the Bewick swan, shovelers, and ruff, and of national importance for pintail, teal, and snipe.

The drainage proposal generated considerable opposition. Those opposing the scheme included the local planning departments, national statutory agencies (among them the Nature Conservancy Council), and many local and national amenity societies. By far, the majority of the evidence produced to oppose the scheme concerned the Brooks' value as a wildlife sanctuary; but in many cases, opponents also referred to the visual value of the area and its value for education and natural history study. These references reveal attitudes to wetland landscapes and the value placed by the public on wetland resources.

The local county planning department considered that "whatever the merits of the drainage scheme to agriculture, they would not outweigh the qualities of landscape and value to nature conservation which made the Amberley

Table 3.2 Significance of Changes of the Major Landscape Elements within the Main Landscape Zones of the Yare Basin, Britain

Measure of Change	Landscape Zones				
	1A Fully enclosed valley	1B Less- enclosed valley	2 Open valley	3A Open	3B Extensive open
1. New elements introduced or becoming significant	0	38	21	28	26
2. "Significant" or "dominant" elements suffering considerable loss	0	38	33	33	42
3. "Significant" or "dominant" elements remaining unchanged	100	14	42	39	31

Note: Figures are percentages and show the proportion of landscape elements listed in Table 3.1 that are affected as shown.

Source: Land Use Consultants, 1978.

Wild Brooks unique" (Ministry of Agriculture, Fisheries, and Food, 1978, p. 20)*. The changes to land use and field patterns, which would accompany agricultural "improvement", would affect adversely the scenic qualities in the extensive flat plain of the river valley. The landscape character of the flood plain is a foil to adjoining chalk downs, forming a special element in the Area of Outstanding Natural Beauty. The site comprises approximately 6 percent of the total flood-plain land in the County of Sussex, but it is a unique example of a relatively unchanged wetland habitat.

The Council for the Protection of Rural England maintained at the inquiry that the landscape would become "an ordinary piece of countryside with an insignificant mixture of field uses" (*ibid.*, p. 22), as opposed to its current rich variety of land use, if the scheme were to go ahead. The Wild Brooks is a subtle landscape of particular charm among the attractions of Sussex, and it should be retained unspoiled for posterity. Increasing access facilities to the

Brooks would attract motorists and adversely affect the peace and tranquility of the landscape.

Local amenity societies stressed the nature-conservation value of the Brooks as well as their educational importance. Information on the numbers of visits by groups and individuals was presented to support this case; fourteen bird-watching societies had visited the Brooks 43 times in the last three years, with an average party size of twenty-five to thirty. Naturalists, botanists, entomologists, and natural-history societies also made visits; fourteen of these societies had visited the area 18 times in the previous three years. Educational parties from local schools, colleges, and universities also made a significant number of visits to study the flora and fauna. The Wild Brooks Society drew attention to the "splendid views over the Brooks to the downs [hills] above Amberley" (*ibid.*, p. 32) and the "pleasant walks over the site."

The society opposed the scheme because "it would destroy the primary wetland value of the site with severe loss of wildfowl, flora and fauna,

*The subsequent sections describing the evidence put by opponents of the drainage scheme draw heavily upon the text of the Inspector's report to the Ministry of Agriculture, Fisheries and Food (1978). Where quotations are given the page numbers refer to this report.

making visits there much less enjoyable and changing the characteristics so much that amenity would be substantially reduced" (ibid., p. 32).

The inquiry inspector (adjudicator) recommended against the drainage scheme mainly because the cost-benefit analysis was not favorable (Parker and Penning-Rowse, 1980). However, some useful comments were made about the visual and nature conservation value of the Brooks. The opponents of the scheme, in the inspector's view, had "clearly demonstrated that the Amberley Wild Brooks constitute a very important site in respect of unique natural history features, flora, fauna, birdlife and general amenity.* Amenity interests are bound up with the natural history to a considerable degree, but there are also pleasant walks and views which would become less attractive if the drainage works were carried out" (ibid., p. 39). In ratifying this recommendation, the Minister for Agriculture recognized the amenity and nature-conservation value of the Brooks and refused to grant aid for the drainage works.

One persistent theme running through this inquiry was the need for more detailed guidelines for balancing the requirements of agriculture and conservation. In the final decision, the Minister refused to establish an assessment system because he considered that "such guidance would not be of practical value because the factors affecting each individual site—that is, the farming, conservation and amenity requirements—and the weight to be given to them will be different in each case" (ibid.). Such a judgment would appear to favor assessments of wetlands in isolation, perhaps at public inquiries, rather than through an overall assessment scheme for British wetlands as a whole.

Conclusions

The visual, cultural, and nature-conservation values of wetlands in England and Wales are becoming more clearly recognized as the resource diminishes. Further assessments of these resources are under way and new guidelines are being prepared for balancing agricultural and other interests. Two new

sources of information are important in this respect. First, regional water authorities are undertaking systematic surveys of their wetland areas at the request of the Ministry of Agriculture, Fisheries, and Food, as is their obligation under Section 24(5) of the Water Act of 1973. These surveys are intended to identify all areas of potential land drainage and set priorities for future drainage schemes (Ministry of Agriculture, Fisheries, and Food, 1974; Parker and Penning-Rowse, 1980; Penning-Rowse and Chatterton, 1976). Some water authorities have virtually completed these surveys (Severn Trent Water Authority, 1978; Wessex Water Authority, 1979) and they provide a complete analysis of wetland areas for the first time. Nevertheless, these assessments do not evaluate the visual or nature-conservation values of the wetland areas concerned, and the cost-benefit analyses provisionally undertaken simply judge the costs of drainage compared with the benefits of increased agricultural production. Clearly these assessments need to be complemented by a comparable survey of other significant wetland values.

The second source of information is helpful in this respect. The Water Space Amenity Commission (1978), an advisory organization responsible for assisting water authorities in the recreation and amenity field, has produced guidelines for land-drainage engineers that should promote a greater understanding of the effects of land drainage on wetland environments. Detailed advice is given for the complete range of wetland environments on how best to reconcile drainage with the maintenance of environmental and visual values. For example, the guidelines advocate that provision should be made in all capital schemes for replacing the trees, shrubs, and hedges removed during the drainage works, and where possible these should be augmented. Their siting "should enhance the landscape and where necessary screen and soften the effect of intrusive elements such as sluices, locks and gauging stations." An invaluable complementary data source is the complete review of the ecological importance of all sites of nature-conservation value in Britain, undertaken over a period of ten years by the Nature Conservancy Council

*In Britain, the words *amenity* and *landscape* are often used synonymously.

(Ratcliffe, 1977), which details and evaluates the wildlife value of many wetland sites in England and Wales. Together, these assessments should give those making land-use and land-drainage decisions more information on the values of the wetland sites.

There are limitations, however. The review undertaken by the Nature Conservancy Council makes no assessment of visual aspects of wetlands, since this is not the area of the council's concern. The Water Space Amenity Commission Guidelines fail to note criteria by which decisions *not* to drain wetland areas might be taken. The water authority surveys are narrow, concerned only with areas that potentially warrant drainage.

Moreover, many fundamental aspects of wetland areas are revealed by the Amberley Wild Brooks inquiry and the Yare Basin survey, and research directed at obtaining more information may simply fall into the trap of equating data with answers (Penning-Rowsell, 1981a). In both studies the opponents of the drainage and flood-protection schemes do not make explicit what constitutes unacceptable landscape change. For example, Land Use Consultants states: "It is unlikely that new planting will be acceptable along dykes, as this would impede maintenance . . . but lines of trees could perhaps be planted along new access roads. Regular lines of trees in the central area [of the Basin] would be a new element in the landscape, but would not necessarily be unacceptable" (Land Use Consultants, 1978, p. 17). New farm buildings, however, are considered unacceptable, although the old wind pumps and steam pumps—relics of a former farming system and technology—are highly prized. The conclusion from this example is that whatever is old is good and whatever is "unnatural" is bad. The "prairie" that forms the grazing land in the center of the Yare Basin is highly praised for its landscape character, yet elsewhere the removal of farm landscape features and thereby the creation of prairie landscapes is deplored or at least meets with disapproval (Westmacott and Worthington, 1974; Shoard, 1980). By what logic are grain towers ugly and windmills attractive? How should or how can assessment systems cope with attitudes that simply revere the past or what is familiar except by recording potential change? In essence, this is what Land

Use Consultants has attempted, and it recognizes that there can be "no absolute statement of the acceptability, or otherwise, of the changes of the landscape. Ultimately a political judgment must be made by those charged with the responsibility for conserving and managing the countryside generally" (Land Use Consultants, 1978, p. 18).

Thus we return to those organizations and agencies that are responsible for wetlands policy and management. Protagonists of wetland conservation must understand the forces governing the agricultural intensification of these areas and other pressures for land-use change. The change of wetland resources through these forces must be located within the economic system governing environmental change and thus located as a consequence of political decisions. From such analyses the researcher can only conclude that to label the assessment of wetland resources as merely a technical problem requiring a technical answer is misguided and dangerous.

Obviously, more research is required, principally into the human reactions to landscapes in general and wetlands in particular so that landscape description and assessment systems and frameworks and other technical aids in decision-making are well founded upon knowledge of what people value in wetland environments. This area is a minefield of conceptual problems, not the least of which concerns the complex relationship between landscape familiarity and appreciation that renders all things old as wonderful and all things new as unacceptable. However, we know little about the bases and determinants of such attitudes. Nevertheless, until we have more detailed information on reactions to and perceptions of wetland landscapes, the defense of the most cherished landscape areas will continue to involve confrontation, and landscape protection will, as a last resort, be attainable only at inquiries, investigations, and in the courts of law.

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Legislation cited: Land Drainage Act of 1930, Land Drainage Act of 1976, Water Act of 1973, and Countryside Act of 1968.

PART II

Perception of Wetland Visual Values
