
Wetland management and recreation: practical experiences and recommendations for future management

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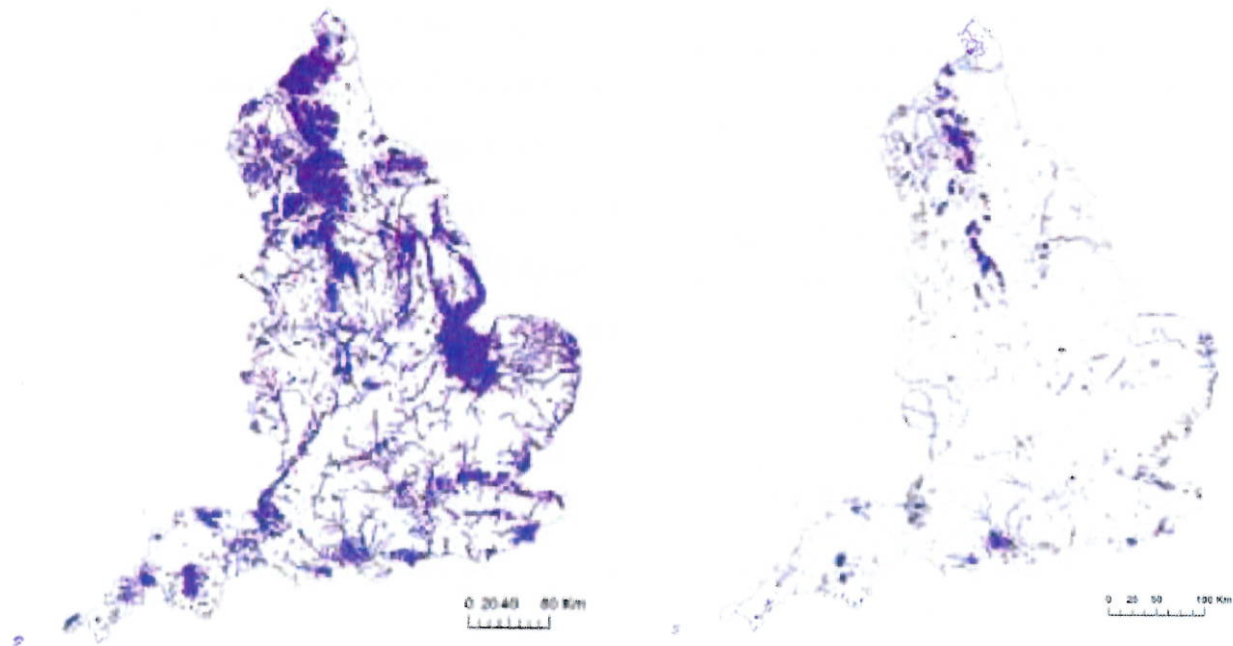
Introduction

The term wetlands covers a broad range of habitats which have a freshwater influence including wet grassland, swamp, dune slacks, mire etc. (Gardiner 1996). When advising on management, Brooks and Agate (1981) differentiate between wetlands, i.e. sites with wet soils (waterlogged) and waterways, i.e. bodies of fresh water. This paper considers the management and restoration of the latter type of wetlands.

Freshwater and saline lakes account for less than 0.02% of the total water resource on Earth (Wetzel 1982 in Scheimer et al 1999). Yet

despite the value of wetlands being long recognised and such habitats probably being amongst the most accessible of all habitats to Man, they have long been taken for granted (Holms and Hanbury 1995). It has been estimated that England has lost ninety percent of its wetlands in the past 1,000 years (Wetland Vision 2008a)

The value of a freshwater wetlands for wildlife frequently depends on the degree and type of management which occurs within the water body itself and its immediate surroundings (Holmes and Hanbury 1995). Historically poor wetland management along



Theoretical extent of historic wetlands (left) and current extent of wetlands (right)
Figures taken from Wetland Vision 2008 b and 2008 c. The historic wetland map indicates historic landscapes with large and expansive wetlands, the current wetland map shows both designated wetland habitat (dark) and undesignated (grey).

with decreasing water quality (ibid), deliberate drainage etc. have contributed to the loss of British wetlands.

Core to any wetland site management or wetland creation is the assumption that management will lead to an increase in, or retention of, the value of that wetland. Such wetland values can be ecological, economical and/or social. If it can not be demonstrated that management will maintain or enhance such values then it should not take place. There is therefore a need for robust evidence and systematic data collection to ensure that management and restoration are effective and beneficial. Yet, as noted by Sutherland et al (2004), much of current conservation practice is based upon anecdote and myth rather than a systematic appraisal of the evidence and data.

Methodology

There are a number of sources of advice for wetland managers, in particular in relation to wetland creation or wise use of wetlands, e.g. Maltby (1991), Scheimer et al (1999) Downs et al (2002) Labadz et al. (2002) and ELP (2008). These highlight a range of principle and themes for wetland managers. There have, however, been few reviews which specifically draw on the experience and expertise of practitioners in wetland management; Grenel (1994) interviewed a range of wetland practitioners in California; Sutherland et al (2004) surveyed a range of individuals involved in wetland management in the Broadlands; Holly (2006) has interviewed several managers involved in coast restorations.

For this paper, eighteen practitioners involved in wetland management in England were interviewed. The interviewees included individuals from statutory organisations, Natural England, Defra, Environment Agency, as well as site managers, technical specialists and volunteers. The interviewees covered the full range of wetland management and restoration types including river management, coastal wetland creation, upland wetlands, flood storage sites etc. Sites covered ranged from small ponds to large scale wetlands. Interviewees were asked questions relating to four themes:

1. The type of wetlands and wetland management/restoration in which they were involved;
2. The reasons for wetland management/restoration, including benefits gained from such management/restoration;
3. The main problems and risks they had faced in management /restoration; and
4. Advice for other wetland practitioners they had gained from their experience.

The responses have been collated and arranged under common issues and themes and related to existing literature in the remainder of this paper.

Reasons for wetland management and creation

Grenel (1994) in California identified ten functions of wetland for which wetlands were managed or restored (Table 1)

Table 1

Reasons for managing wetlands in California – key functions (Grenel 1994)

Vegetative diversity and primary production

Nutrient transformation and retention

Sediment trapping and erosion control

Flood storage and desynchronisation

Groundwater discharge and recharge

Fish habitat

Wildlife habitat

Recreation

Endangered species habitat

Research/education/natural; heritage

All of the above functions were mentioned by at least one of the managers interviewed for this paper.

The drivers for wetland management or restoration or creation are complex and varied and include those listed in Table 2.

Table 2

Drivers of wetland management and restoration

- Physical and topographical changes to substrate – subsidence, erosion and deposition;
- Economics, wetlands being cheaper than maintaining flood or coast defences;
- Flood management, including flood storage, drainage flow management etc.;
- Habitat biodiversity targets;
- Management linked to maintaining favourable status on statutory sites;
- Planning related (mitigation /compensation 106 agreements);
- Species priorities – great crested newts, water voles, breeding birds etc.;
- Educational and awareness raising – pond dipping, demonstration schemes;
- Aesthetic and fashion – garden water features and inclusion of wetlands as part of landscaping;
- Sustainable urban drainage schemes; and
- Waste water treatment, reed beds etc.

The most common reasons for wetland management/restoration mentioned by wetland practitioners were biodiversity, management of site threats, flood management, water quality management and enhancement for specific species, or control of problem species. Few interviewees/practitioners mentioned either financial considerations or social considerations, unless prompted.

The UK Biodiversity Action Plan sets out plans for a range of priority habitats in the UK. More than half the Habitat Action Plans relate to wetland habitats (including coastal). In addition, there are a large number of species action plans, relating to species which rely, for at least part of the time, on wetlands for food, shelter etc. In light of the above biodiversity

commitments and wider international commitments relating to wetlands (including the Ramsar Convention) it is not surprising that biodiversity is a key driver for wetland management.

Most interviewees mentioned direct and indirect threats to wetlands as reasons for management or restoration. It seems likely that existing pressures on wetlands will increase in future years, in particular in relation to new developments, changing land management, changing attitudes and climate change. All of these factors could potentially lead to the loss or deterioration in current wetlands. Nicholls (2004), for example, notes that, according to some models, losses of coastal wetlands due to sea-level rise alone could be between five and twenty percent by the 2080s.

Flood management is increasingly recognised as a driver for management and recreation of wetlands. This can be linked to growing populations in coastal and flood plains (Bijlsma et al., 1996), widespread subsidence, urban drainage schemes etc. In the future, such pressures could increase considerably, for example it is estimated that the number of people flooded in a typical year by storm surges would increase by between six times and fourteen times due to global sea levels alone (Nicholls et al., 1999). An increase in the extent of human exposure to flooding and the changing standard of flood management infrastructure all have implications for the number of wetlands and their characteristics and management.

Downs *et al* (2002), in relation to river restoration, note that wetland management objectives can be community-based, technologically-based and focused on ecological improvements; and that objectives of river restoration can be numerous and that compromises may be required. Although not specifically mentioned by interviewees, the adoption of such a three theme objective based framework may be beneficial to successful interdisciplinary wetland management.

Key benefits of wetland management and restoration

A wide range of benefits from wetland restoration or management were mentioned by interviewees. Most of these relate specifically to the drivers of management listed in Table 2. Additional benefits of wetland management noted include:

- That increased ecological benefits derived from wetland management or restoration can occur rapidly; with increased populations and new species arriving in some cases just a few days or weeks after management or restoration begins.
- Biodiversity improvements can continue to increase or be maintained for several years, sometimes with limited management needed. Longer term maintenance of value will, however, often require active management.
- Visual and amenity benefits may take a little longer to establish but local communities may rapidly start to notice differences and increased site usage can occur fairly quickly
- Some wetland management can be fairly cheap but this is not always the case and good management requires a longer term financial commitment.
- Initial planting and management and associated costs can often be small scale, provided the site is not too isolated from other wetlands. In some cases however, planting and reprofiling costs can be very high.
- Wetlands can have direct and indirect economic benefits, potentially including small scale but increased employment, reduced costs of flood management etc.

Key risks and problems in wetland management and restoration

There are a number of risks involved in wetland management and restoration. It is essential that such risks are recognised and taken into account at an early stage in management. The key risks identified by interviewees are set out below.

Table 3

Sources of information used by practitioners in Broadland, UK (Sutherland et al 2004)

Source of information	Number Respondents	Percent Respondents
Common sense	55	32.4
Personal experience	37	21.8
Speaking to other managers in region	34	20.0
Other managers outside region	4	2.4
Expert advisers	17	10.0
Secondary publications	19	11.2
Primary scientific literature	4	2.4

Sutherland et al (2004) reviewed a range of stakeholders and managers involved in wetland management in Broadland, East England, the type of evidence they used in making wetland decisions in illuminating, see Table 3.

As shown in Table 3 above and in the interviews for this paper, personal experience, common sense and informal communication with colleagues are the most frequently used sources of evidence/information in wetland management. The limited use of expert opinion and robust scientific evidence in wetland management and restoration is a key potential risk. Common sense and experience alone cannot guarantee successful restoration or enhancement of wetlands. Failure to draw on

existing technical advice, expertise and experience is a major risk to successful wetland management.

Another key risk is the unpredictability of the impacts of wetland management or restoration. Even with good planning, wetland management may not have the predicted result and unexpected consequences can occur. For example, in the managed realignment at Abbots Hall Farm in Essex, despite attempting to reducing the levels of nitrogen in the soil prior to restoration, high levels were maintained and this had impacts on the development of new communities.

An associated risk/problem in wetland management is the failure to consider the wetland site in context; this may involve a failure to consider the impacts of the management of surrounding land and waterbodies on the managed wetland and a failure to consider the impacts of the wetland management/restoration on the surrounding land and water. For example coastal realignments have led to changes in coastal wave dynamics leading to the burial and /or erosion of nearby oysterbeds. Also observed is the frequent failure of water vole translocation habitat creation schemes or poor survival rates of water vole populations when translocated into created wetland sites. Where impacts affect protected species and/or legal land and water uses, the consequences for negative publicity and perception can be high.

A failure to take into account the current site value and deal with protected species or species of high biodiversity value prior to implementing management was noted by a number of interviewees. For example, in several wetland restoration schemes, despite weeks of mammal trapping being carried out a number of animals were still present on site when the area was flooded. In some cases this included species such as water voles, water shrews, brown hares and, in one case, harvest mice.

Failure to include an element of longer term management can mean that succession on the managed restored wetland site does not proceed as desired, potentially resulting in poor

colonisation or colonisation with weedy species. Such habitat may be unattractive and give a negative impression of the scheme. Three interviewees mentioned problems with invasive non-native species post-management.

Lack of physical and hydrological site survey and monitoring was seen as a common failure in wetland management or restoration. In some cases this meant that the resulting habitat was too wet or too dry, suffering from rapid infilling and or rapid hydroseral succession etc. For example, in one recently created wetland site in South Yorkshire poor planning and surveying meant that the whole site was under water for much of the winter, not just the newly created ponds.

Implementing management without detailed site data/monitoring was seen to be a major risk. Several interviewees advised that a full environmental impact assessment approach be used prior to major site works or wetland recreation.

A small number of interviewees mentioned the importance of taking a strategic and interdisciplinary approach in wetland management / restoration; although when prompted lack of funding and longer term funding was mentioned by most interviewees as being a major risk to wetland management success.

Bradshaw and Chadwick (1979) recognise four major areas of failure in restoration schemes. These can equally apply to site management schemes (see Table 4).

Table 4

Types of failures in Restoration

Inadequate baseline site surveys:

Failing to identify positive/negative factors

Surveys are not holistic – gaps in coverage

Physical Based Failures:

Hydrological

Chemical

Edaphic

Ecological Based Failures:

Failure in rehabilitation, e.g. pH, Nutrients

Management not based on local ecology

Soil and substrate related failures

Socio-economic Failures:

Legal failures

Political failures

Economic failures

It is interesting to see that whilst interviewees mentioned most of the baseline, physical and ecological failures listed in Table 4, social and economic failures were less frequently mentioned and recognised, unless it was after a problem had arisen.

Recommendations for effective wetland management and restoration

Wetland Vision (2008a) set out clear objectives for wetland management and recreation in England for the next 50 years (Table 5).

Table 5

Wetland Vision's 50 year vision of wetlands in England (Wetland Vision 2008a)

- Place existing wetlands at the heart of our vision; enabling them to adapt in the face of climate change by linking new and existing wetlands across the landscape.
- Restore degraded wetlands in the uplands and lowlands (including peatlands, rivers and lakes), so that, in functioning more naturally, they can provide enhanced benefits to society.
- Extend, in some cases double, lowland wetland habitats such as reedbed, ponds and grazing marshes.
- Preserve the unique and fragile record of our historic environment by keeping the most important former wetland sites wet.
- Create and restore wetlands wherever they can support wildlife, reduce run-off and pollution, and provide wildlife-rich green spaces for people to enjoy.
- Make wetlands more relevant to people's lives by better understanding and harnessing the benefits provided by naturally-functioning rivers and wetlands – that can slow and store flood waters, protect water quality, recharge groundwaters and store carbon – and then by communicating these benefits widely throughout society.

The Wetland Vision provides a good overarching set of objectives for wetland management and restoration but there is still a need to link these to practical site specific management. The funding from Natural England of two million pounds each year for three years, starting in 2008, is a good step forward but additional funding and support will be needed.

Wetland management or recreation is not just about adding water; these projects are complex and often time-consuming in terms of surveying, planning and legal issues (Defra, 2002). Advice on issues to be considered in wetland management and creation are available,

for example Andrews (1995) provide a detailed breakdown of the factors to consider in pond creation, i.e. site, context, water supply, bed, size, depth, margins, substrate, stocking and aftercare. Yet such guidance is often incomplete (e.g. excluding social and planning issues) out of date, or when used is not supported by the required site specific information.

ELP (2008) suggest thirteen principles to be followed in relation to successful wetland creation Table 6. The practitioners interviewed for this paper broadly support these principles but have tended to consider management and restoration under a series of broader themes and include some addition recommendations, see below.

Table 6

Principles for Successful Wetland Creation (ELP 2008)

1. A broadly-based and easily understood vision for the project is important.
2. Acquiring the land is a key step which is highly unpredictable.
3. Obtaining the necessary permissions from regulators is a major milestone, requiring detailed studies and a good understanding of the requirements of many functions within the same agency.
4. Building support among the family of stakeholders is essential. Support for wildlife projects cannot be guaranteed, regardless of the size and resources of the organisation.
5. Building support requires time and resources and cannot be short-cut. It is always worth the investment.
6. High level political support is vital for larger projects and may need engagement by all levels of the hierarchy of the partnership organisations.
7. Partnerships work better than single organisation projects, as they bring a range of expertise, help develop

stakeholder support and are favoured by funders. There are several disadvantages, however.

8. Detailed technical work may be needed to derive a sound restoration plan. Investment made at this stage is highly cost-effective and the work is usually required by regulators.
9. A considerable degree of tenacity is required to see projects through, combined with a good understanding of technical issues, partnership working and the planning and institutional framework. The project manager is crucial in bringing these qualities to a project.
10. Skimping on the initial capital investment, by under-specifying works or using cheap materials, increases revenue costs in the long run.
11. Site set-up should include allowing machinery access and sustainable grazing to maximise long term management efficiency.
12. Good contractors, especially for the groundworks, are vital and the cheapest quote may not always be the most cost-effective.
13. Linking wildlife sites together is a key strategy for a project's success, both in terms of biodiversity benefits and in building support.

Almost all the above themes were recognised by the practitioners interviewed for this paper. The interviewees tended, however, to give advice under one or more of the following six interlinked themes.

Theme 1 The need for accurate site specific data prior to management or restoration

Holmes *et al* (1995) note that for all management work it is desirable to have pre-works ecological surveys. The wetland

managers and practitioners interviewed for this paper go further to state that for major management and restoration projects at least two years of monitoring is required. Surveys should be thorough, detailed and extend beyond the site to consider surrounding land and hydrologically linked wetlands. Surveys should not just look at ecology but also archaeological remains, social and perceptual issues and physical factors (soils, hydrology, stability etc.) There was disagreement over the need for a full EIA. Certainly in some cases where regulatory authority agreement is needed and/or planning permission is required, a full EIA may be essential. In smaller schemes the use of an EIA based approach may, however, ensure coverage of all elements.

Where legally protected species and economically valuable species (including fish) are involved, detailed surveys and, ideally, modelling are recommended.

Theme 2 The need for public support of wetland management/restoration

There is a clear need to sell the idea of wetland creation or enhancement early on in the management and restoration process. Public perception of risks related to flooding are now higher following the 2007 summer floods. Such perceptions may be unfounded, for example the public may perceive that vegetation filled ditches are indicative of a lack of flood management. In some cases public perception may be incorrect. For example there are several cases where creation of flood storage wetlands, which in practice decrease the risk of flooding to nearby houses, have been perceived by locals as seeming to increase the risk of flooding because the presence of water was made more visible.

Whether such fears are founded or unfounded, there is a need to inform and involve stakeholders from an early stage in the process. There are clear benefits to the maintenance of the project's positive profile in keeping locals and other stakeholders informed. Such support can be linked to longer term funding and hence project success.

In other cases, locations for wetland creation may be controversial and, in some cases, initially unacceptable to key stakeholders. For example, the best locations of wetland flood storage sites in urban areas such as those along the Thames in London are currently not acceptable to some councils and interest groups. Similarly, the issue of conversion of good agricultural land to wetland may initially be viewed as unacceptable. A budget for persuasion, promotion and public relations may be needed in such cases.

Theme 3 The need to plan and to monitor

Scheimer et al (1999) recognised the key constraints to restoration as being the inability to set targets and lack of assessment. Yet most wetland schemes covered by this paper did not have two or more years of complete site data monitoring prior to commencement and very few had undertaken any modelling of impacts.

Almost all schemes reviewed had a management plan, normally for five or ten years. However, a higher percentage of the projects looked at had little or limited money for longer term sites works or monitoring. In most cases the majority of the money was allocated to initial site works, planting etc. Several interviewees, looking back at well established wetland schemes, stressed the need to have in place funding or a mechanism for ensuring future funding as key to longer term management.

A few schemes, in particular large scale coastal realignments, had money for up to five years of monitoring. Such monitoring was seen as being invaluable both to the site management and for informing other schemes of potential impacts.

The Wallasea realignment scheme provides a good framework for Monitoring (Defra, 2005). This approach used two types of monitoring which could be transferred:

1. Site Success Monitoring: This is necessary in order to determine whether the habitats created will reach an

ecological value that is sufficient to compensate for the habitats losses and negative impacts elsewhere.

2. **Impact Verification Monitoring:** This is necessary in order to determine whether the realignment has had any negative physical or ecological impacts on the site itself or surroundings (Defra, 2005; Dixon, 2006).

Theme 4 The need to take into account socio-economic factors

As indicated under theme two, fear of costs and risks associated with larger scale wetland management and creation may translate into negative publicity and therefore threaten the success of such a scheme.

The public perceive social and recreational benefits, including public access, as being important in wetland recreations (Defra, 2002). Yet in many cases wetland schemes do not actively seek to inform the public of such associated benefits and often just focus on ecological benefits.

There are potential conflicts between public expectations and public willingness to pay. For example, the general public expects to be protected from flooding but will not necessarily pay for the works, including new wetlands, flood storage, etc. In 2002, the government seriously considered some sort of "Flood Tax" for those in hazardous areas (Crichton, 2005). However, these plans were quickly abandoned following intense public opposition (ibid). There is a need to highlight the social and economic benefits of wetland schemes. For example, recent surveys in Cambridgeshire have shown that creation of new wetlands can increase the number of local jobs and provide additional income via tourism. The ecosystem services approach could be usefully used here and robust data sets are currently being developed.

It was interesting to note how few wetland managers mentioned socio-economic issues when interviewed. The importance of getting the community involved and in support of the

scheme at an early stage is, however, vital to its success, as it can help reduce delays such as those resulting from a Public Inquiry. In some cases steering groups and local forums were set up at the start of wetland schemes to inform, involve and provide advice during the process to the local communities. Such experiences reinforce the conclusion that despite the time and complexity, the consultation procedure needs to be done thoroughly and must not be rushed (DEFRA, 2002).

A few interviewees stressed the importance of using the media, in particular local newspapers and local news networks, in order to make sure the public are well informed. As one interviewee put it 'it is vital to have a smart communications strategy' including frequent communication with the local council and the political element of the area.

Theme 5 Understand the risks and negative impacts and being able to mitigate or compensate

Without good site data, involvement of experts and consultation with practitioners from comparable sites, it is not possible to identify the likely risks associated with wetland management or restoration. Failure to undertake such work at the planning stage can be costly. Creation of wetland habitat will lead to loss of some other habitat (the CROW Act, 2000 (Schedules 5 and 9)) and the Wildlife and Countryside Act 1981 requires replacement habitat for, in particular, water voles and the management of reptiles on site. Therefore, new ditches, either freshwater or brackish, can be created as habitats for displaced water voles or invertebrates found on the site prior to breaching (ibid). Such works are not cheap. At the Branchester realignment site the additional costs for creating replacement habitat and translocation were over £500,000.

Some schemes highlight the value of using independent consultants to make sure that there are no negative impacts to local interest groups or individuals (e.g. Dixon, 2006). But such inputs are not cheap.

Significant risks and significant negative impacts associated with wetland management or restoration need to be identified and, where possible, quantified. The risks considered need to extend beyond the ecological to social, archaeological risks etc. Where risks are identified, mitigation on site or off site compensation needs to be investigated and these costs including in the management plan. When significant negative impacts and/or risks cannot be mitigated or compensated for, it is debatable whether or not the wetland scheme should be undertaken. An EIA based approach may be useful here.

Theme 6 The need for a holistic and strategic overview

Whilst recognising the need to take a strategic approach in wetland management and restoration, most interviewees admitted that their work primarily focused on a specific wetland site and their strategic view was often limited and patchy. Labadz et al. (2002) argue that there are three broader strategic principles to consider when managing or restoring wetlands:

- Principles from ecological restoration;
- Reversing effects linked to surface drainage or abstraction; and
- Reversing effects linked to sediment accumulation and succession.

Management which draws on good ecological principles relating to the above is advisable.

The sustainability of wetland schemes was not considered in many cases. Plans and approaches were often short term with limited longer term targets and a focus on the initial creation of the wetlands, the initial river reprofiling etc. The need for a longer term and sustainable view has been stressed by Downs et al (2002) i.e. 'a sustainable approach to restoration of rivers needs to consider them in the context of dynamic ecosystems, restoration projects based on recreating the desired river morphology are unlikely to succeed.' Such an

approach is essential to wetland management and recreation and it can be argued should be based on four common principles:

- That wetland management and restoration should be process (ecosystems) oriented instead of species focused;
- It should primarily foster the hydrological and geomorphological functions of the river/wetland;
- It should enable/allow the river/wetland do the work (Scheimer et al 1999); and
- That management and restoration of wetlands needs to be undertaken in a broader catchment context.

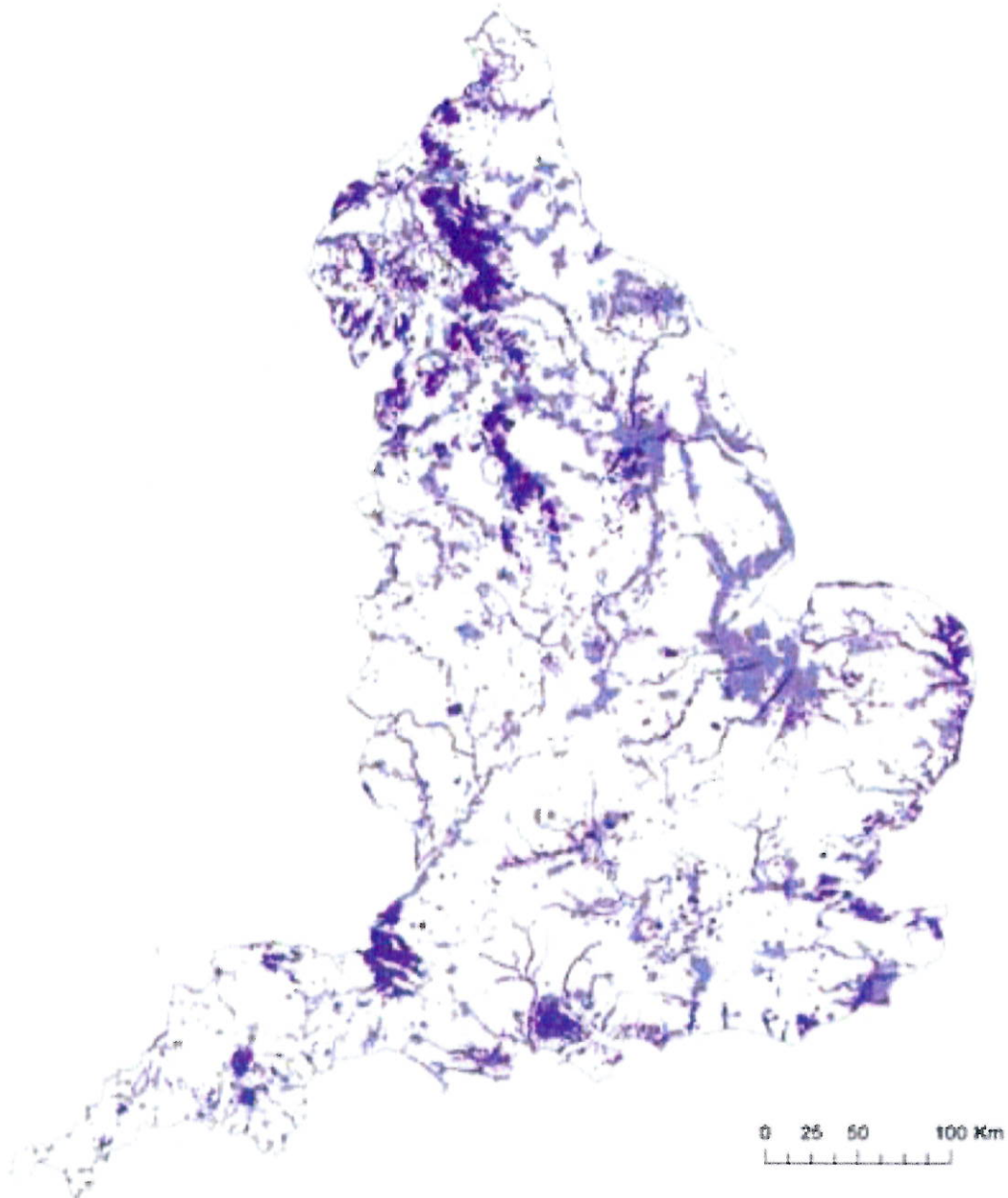
If the Wetland Vision targets for wetland creation are to be met, as well as targets in relation to climate change, flood risk, biodiversity etc. then a broader strategic approach to the management of wetlands and wetland recreation will be needed. Wetland Vision (2008d) indicates potential areas for future wetland potential (see figure overleaf).

Conclusions and key recommendations

Wetlands perform a range of functions (Merritt 1994) including: water purification, flood control, provision of drinking water and irrigation, supply of nutrients to agriculture etc. transport system, source of food, a sewer for wastes, recharging ground water, coastal defences, wildlife habitat, recreational spaces, areas of aesthetic appeal. Management and creation of wetlands (including) rivers designed to benefit wildlife need to take into account basic concepts in terms of energy, channels, habitats, space, stimulation, horizons and scope (Ward et al 1994) and to extend beyond the ecological to take account of physical aspects and socio-economic aspects. A failure to consider the broader context of management / restoration could be costly and potential threaten the success of the scheme.

The main lessons learnt from wetland management and recreation in California (Grenel 1994) were:

- The need for information management and dissemination;



Future wetland potential areas (Wetland Vison 2008d)
Existing wetland areas are shown in dark purple, potential areas in paler purple.

- The importance of planning;
- The high levels of human intervention needed;
- That the multi-functional aspect of projects creates problems;
- The need to use watersheds and riparian corridors as the basis of wetland planning;
- That mitigation is possible but no panacea and no substitute for retaining pristine habitats;

- The importance of regulatory controls; and
- The importance of project selection and prioritisation – limited resources and funds

Such lessons have not been adopted in many wetland management restoration projects in England.

The main advice from UK wetland management and restoration practitioners can be summarised into the following eight points:

1. there is a need to review all site options priori to any management and to be sure that the option chosen is the most reverent and beneficial.
2. Management and restoration needs to be based on good site specific information and there is therefore the need for detailed site surveys at the start.
3. Management should be based on sound and realistic planning, this needs to be costed in.
4. There is a need to involve key stakeholders (including local people) from the start and to keep them informed and involved.
5. Draw on the experience from other sites in managing your site, this includes other practitioners, technical advise etc. including what can go wrong.
6. Management should not be seen as a blue print it is an experiment, expect the unexpected, be able to adapt your management when changes take place.
7. Monitor the site and the impacts of management feed this data in to future management.
8. Inform other so they can learn form your experience.

Sutherland et al 2004 argue that much of conservation is based upon myths. It is clear that in relation to wetland management and restoration there is a need for more monitoring and communication of findings, for improved exchange of experience and information and for a more robust and evidence-based approach amongst wetland managers. The Wetland Vision (2008a) and the strategic approach being adopted by the Environment Agency provide a good framework for strategic wetland management. Individual site management needs to link into and influence such strategies. There is a need for a two-way dialogue between the strategic players and site specific practitioners.

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