

NRA - ANGLIAN 251



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*National Rivers Authority
Anglian Region*

CONSERVATION - ANNUAL REPORT 1991/92

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INTRODUCTION

1991/92 saw a number of significant changes for conservation in the Anglian Region, and these had impacts on staff numbers, legal duties, procedures and expenditure. The changes were made against a background of major growth for conservation and as a result conservation is increasingly a major integral part of the Region's work and planning.

1. CONSERVATION STAFF

A total of 5 new posts were created within the conservation function during the year. Two of the posts are based at RHQ while three are based in the Areas. The Regional posts complement the existing team of two staff, providing technical support in computer database development and conservation input into flood defence and water resource design work. The Area posts, one in each Area, provide support to the Fisheries, Recreation and Conservation Officer and are primarily responsible for the input of conservation recommendations into the routine maintenance programme and planning liaison. Details of all these aspects are discussed in greater length at the appropriate point within this report.

2. CONSERVATION DUTIES

There have been a number of changes in the conservation duties and procedures of the Region; some of these are associated with changes in legislation, while others are related to better working practices and procedures. The changes are wide reaching and greatly increase the effectiveness of conservation input to all the Region's activities.

(i) LEGAL

The Water Resources Act, 1991, which replaced the Water Act 1989 created wider and greater responsibilities for conservation in all the NRA's duties, with Section 2 requiring the NRA to consider conservation as a function in its own right.

"(2) Without prejudice to its duties under section 16 below, it shall be the duty of the Authority, to such extent as it considers desirable, generally to promote

- a. the conservation and enhancement of the natural beauty and amenity of inland and coastal waters and of land associated with such waters;
- b. the conservation of flora and fauna which are dependent on an aquatic environment; and
- c. the use of such waters and land for recreational purposes;"

At the same time the duties which were contained in Sections 8, 9 and 10 of the Water Act have also been restated in the Water Resources Act under Sections 16, 17 and 18.

*No
- no new
responsibilities*

(ii) PROCEDURES

Environmental Assessment

Major changes in the procedures covering project appraisal were detailed in the year and this has led to significant changes in the way conservation is catered for in both the flood defence and water resource capital programmes. Principally, the changes, which were produced through extensive collaboration with flood defence and water resource colleagues, ensure the earliest possible involvement of conservation staff in any project proposal. The outcome of this is that as soon as a problem is identified from a flood defence or water resource point of view, the implications for conservation can be included and considered immediately. This aspect is essential if environmental considerations are to be properly met and the NRA is to demonstrate fully integrated solutions to whatever challenges it meets.

Project Appraisal

The increased adoption of environmentally sensitive solutions in both water resource and flood defence work also demonstrates a much greater flexibility in approaching problems from the disciplines themselves. It should be noted that it is this sensitivity which has been a material part in adopting the new procedures which ensure that conservation is seen as a function in its own right. The flow chart (Figure 1) shows the mechanism for the inclusion of conservation and environmental aspects in flood defence project appraisal. This highlights that conservation is now an integral part of the problem, of identifying and choosing effective options and in ameliorating any environmental effects resulting from the construction.

Detailed Design

The inclusion of all these aspects means that conservation requirements are not merely 'bolted on'. In addition to providing environmentally acceptable solutions, opportunities for conservation can also be built into the programme of works, not merely tacked on to the end. The best example of this during 1991/2 was the production of a report on conservation initiatives which could be undertaken as part of the extensive five year programme of the Ouse Barrier Banks raising work. The report was a compilation of initiatives identified by the NRA and external bodies such as RSPB, Wildfowl and Wetlands Trust, Beds and Cambs Wildlife Trust and English Nature. It identifies a whole range of potential enhancements to the barrier banks and their environs, exploiting possibilities on both NRA-owned and non-NRA owned land. The report acts as a manual, which the environmental officer employed as part of the work can follow, thereby ensuring that conservation initiatives employed in the scheme are both appropriate and effective.

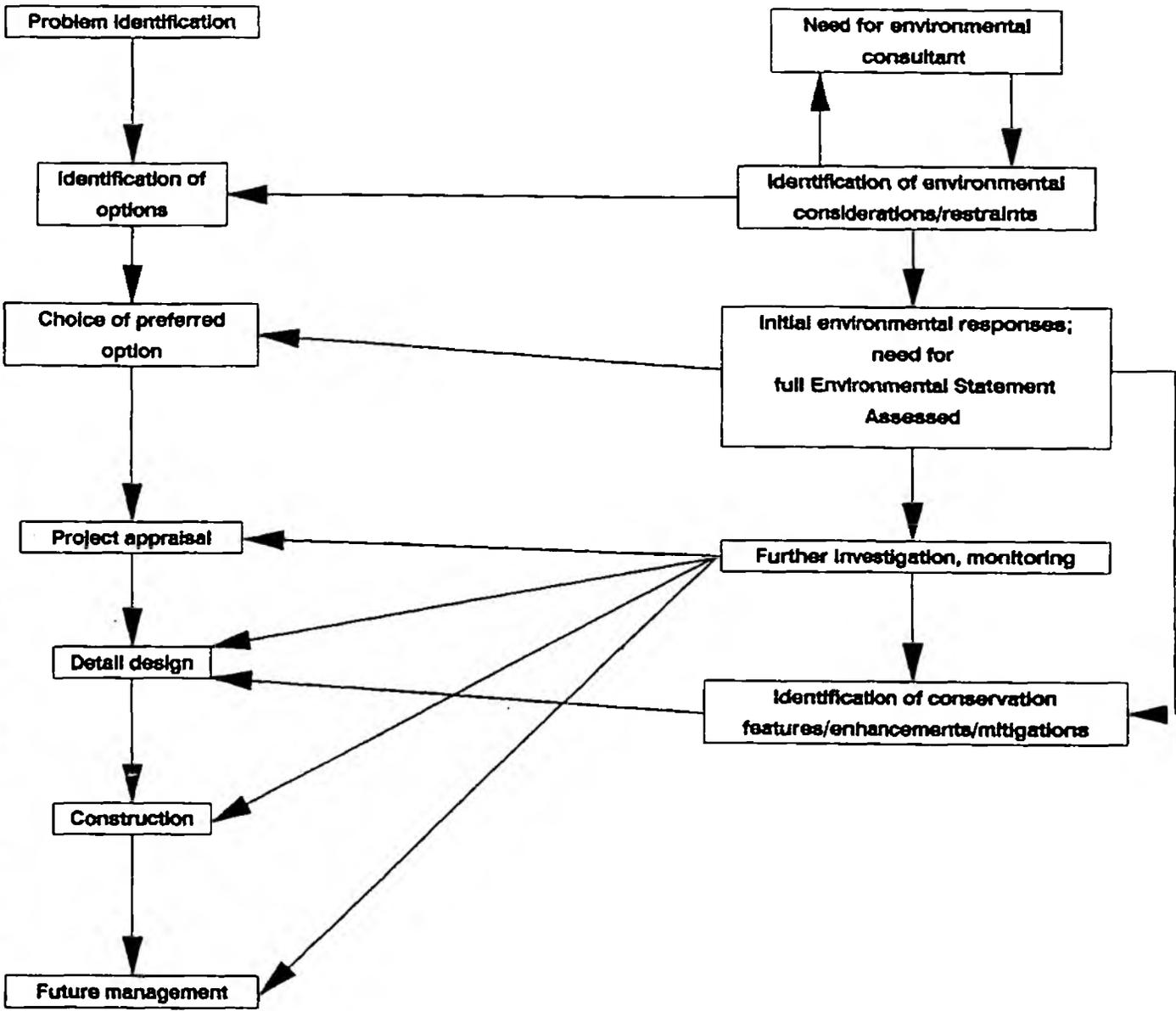


Figure 1

(iii) CONSULTATION WITH EXTERNAL AGENCIES

Capital and Maintenance Programmes

The importance of consultation with external bodies is both a legal and welcomed duty of the NRA. If the NRA is to meet its environmental obligations, then it is essential that it be aware of the concerns of others. Within the major functional areas of flood defence and water resources this is especially the case if the solutions sought for particular problems are intended to be environmentally sensitive.

During the year there has been considerably increased growth in consultation with external organisations at all levels and at all stages of work. For example, English Nature were involved in identifying the requirements for the environmental assessment of necessary flood defence work at Brightlingsea. There is a National Nature Reserve next to the town which the proposed works have the opportunity of defending. Clearly, setting environmental briefs which cover the concerns of external bodies can only help to instil confidence that the work will be assessed and executed in a satisfactory way. Such an approach also ensures that environmental consultants are properly briefed with regard to their duties.

County Wildlife Conference

A major exercise in consultation was undertaken in February when the Region held a conference with all the County Wildlife Trusts in the Region. The primary objective of the day was to examine in an open way the challenges and issues which the NRA have to face and relate these to the concerns and ideas that the County Wildlife Trusts have. Although non-statutory organisations, it is a firmly held view of the NRA that these bodies are major 'owners' of conservation and conservation issues at a local level and therefore their views are of fundamental importance. The value of the conference was that all views were aired in an open and constructive manner and identified a number of areas which required further examination as well as identifying ways in which the Trusts can work with the NRA towards a greater fulfilment of conservation. The papers from the conference were issued with the last RRAC papers.

(iv) COLLABORATION WITH EXTERNAL AGENCIES

MAFF - Environmentally Sensitive Areas

There have been major developments in the ESAs in East Anglia following the current review by Agricultural Development Advisory Service (ADAS) and the Region has been closely involved with these reviews, commenting on the proposals and discussing implications with ADAS staff. The potential benefits to the environment of the two organisations working together in those ESAs which centre round rivers is fully understood and requires considerable planning which will be undertaken in 1992/3.

During 1991/2, however, there was a significant programme of work carried out on the Sapiston River, a tributary of the Little Ouse, in the Breckland ESA, which was primarily aimed at raising river levels to raise water levels in the adjacent meadowland. This work involved discussions with the ADAS project officer, the landowners and flood defence staff and resulted in a number of gravel riffles being greatly enhanced by the addition of some 500 tons of gravel (Figure 2). The outcome was to raise river levels by about two feet, which had the effect of restoring water levels in adjacent dykes and ditches (Figure 3). In addition there were clear and significant effects to the channel itself resulting in a river which is fuller, wider, rich in semi-natural diversity and aesthetically infinitely more pleasing. Suffolk Wildlife Trust undertook the initial survey and will carry out follow-up work to determine how effective the work has been on the river and on the meadows. It should also be stressed that the landowner was delighted with the work.

The potential for similar work throughout the Region is enormous with the extension up the river valleys of the Broads ESA, the Suffolk river valleys and the proposed Essex coastal ESA.

Countryside Commission - Countryside Stewardship

As with ESAs discussions have taken place on planning and detailed bases with the Countryside Commission to ensure that both the strategic and detailed aspects of Stewardship applications can be met. The value of the Stewardship scheme is that in identifying river valleys as target areas the potential to restore wetland environments must increase. That the NRA is involved to ensure this is done as effectively as possible is critical.

Conservation and flood defence operations staff have already collaborated on a number of schemes throughout the Region in 1991/2 and it is hoped that this will be increased during 1992 and in future years. An example is given in the section describing conservation work in the Central Area.

(v) PLANNING

Under Section 16 of the Water Resources Act 1991, the NRA has a duty to take into account the conservation and enhancement of the water environment when commenting upon planning applications. This work is carried out by the Area conservation staff and during 1991/92 a total of 948 planning applications were commented on. A representative from the conservation section now sits on the Regional Planning Group in recognition of this growing role of conservation within planning.

A comprehensive set of standard responses to be used when commenting on planning applications has been compiled in order to convey conservation requirements in a form which planning authorities can readily interpret.



Figure 2: Riffle enhancement on the Sapiston River in the Breckland ESA



Figure 3: Raising of water levels in meadowlands adjacent to the Sapiston River following riffle enhancement work.

The conservation section has had the opportunity to comment on a number of national conservation planning matters: draft planning policy guidance on nature conservation and coastal planning respectively; Department of the Environment consultation paper on Marine Consultation Areas and House of Commons Environment Committee report on coastal zone protection and planning.

3. FINANCE

CONSERVATION CAPITAL PROGRAMME

1991/2 saw for the first time the allocation to conservation function a budget of its own (Table 1). Although not large, this budget creates the potential for the production of a capital programme for conservation and this was developed during the year, incorporating proposals from both internal and external sources. A copy of the current programme is included in the report.

It should be emphasised that this budget does not replace or reduce the requirement of other functional works to identify and pay for conservation work. Instead it allows conservation to work proactively in a number of ways to further the aquatic environment in the Region. The programme which represents potentially the way forward lays emphasis on collaborative projects with other organisations, and it is felt that this approach will offer the highest degree of effectiveness both from the point of view of limited budget and through addressing customer requirements.

During 1991/2 the capital programme was approached in two ways. Firstly, the county wildlife trusts were appointed to survey and identify management requirements of a number of parcels of NRA owned land which would maintain and enhance their conservation value. Some of these already have recognised value, such as Roswell pits near Ely, while others, such as the Padholme reservoir, have the potential to become much more important than they currently are. The outcome of the work at Padholme is that in conjunction with Beds and Cambs Wildlife Trust the site is likely to be designated and managed as a local Nature reserve. Similarly, NRA land at Guyhirn is alongside existing nature reserves and the possibility of linking the two to extend the overall size of the area is being examined with March Naturalists.

The second approach was to use capital money to carry out programmes of restoration work on degraded river channels in the Region. A major programme of work was intended for the River Welland, but this was cut as a result of a reduction in the budget during the year. A smaller scheme was carried out however on a tributary of the River Nene following requests from Northants Naturalists Trust. The Harpers Brook at Aldwinckle runs through an area of high nature conservation value - Titchmarsh SSSI and nature reserve. The Brook offered little in terms of habitat value, having been realigned in the 1970s, following gravel extraction works to form a largely canalised, trapezoidal, incised channel. In addition, abundant weed growth meant annual weed cutting and the disposal of the cuttings within the nature reserve was causing the local wildlife trust concern.

N.R.A. ANGLIAN REGION
 CONSERVATION CAPITAL PROGRAMME
 Last Updated(29/06/92)

APPROVED PROGRAMME

Project No.	Project Title	Area	Stage A complete	Cost	CASH ALLOCATION				
					92/93	93/94	94/95	95/96	96/97
9017001	WETLAND ECOLOGY DEVELOPMENT AT NRA SITES		no	100	15	35	30	20	0
	R.WELLAND ECOLOGY RESTORATION SCHEME		no	126	11	42	42	16	15
	HARPERS BROOK RESTORATION SCHEME		no	4	4	0	0	0	0
9017000	RIVER HABITAT RESTORATION		no	122	0	30	30	62	0
TOTAL					30	107	102	98	15

ADDITIONAL PROGRAMME

Project No.	Project Title	Area	Stage A complete	Cost	CASH ALLOCATION				
					92/93	93/94	94/95	95/96	96/97
	FENLAND RESTORATION FEAS. STUDY		no	50	10	10	10	10	10
	BARN OWL BOXES	E	yes	4	4	0	0	0	0
	R.LARK/WEST STOUR RESTORATION SCHEME	C	no	4	4	0	0	0	0
	MARE FEN WETLAND MANAGEMENT	C	no	4	4	0	0	0	0
	HAVERHILL FLOOD STORAGE PROJECT	E	yes	20	10	10	0	0	0
	COSTESSY FISH FARM	E	yes	6	6	0	0	0	0
	REOPENING EARSHAM DAM CHANNEL	E	yes	10	10	0	0	0	0
	R.CAM HINXTON RESTORATION SCHEME		no	4	4	0	0	0	0
	FISHER'S DYKE RESTORATION SCHEME		no	3	3	0	0	0	0
	CONSERVATION PROJECTS AT NRA OFFICE		no	2	2	18	0	0	0
	RIVER VALLEY PROJECTS		no	60	20	20	20	0	0
	OUSE WASHES LANDSCAPE INITIATIVE		no	50	10	20	20	0	0
	R WENSUM RESTORATION		no	105	35	35	35	0	0
	FORESTRY COMMISSION/NRA BUFFER ZONE		no	50	10	20	20	0	0
	LITTLE STREAM RESTORATION INITIATIVE		no	110	30	40	40	0	0
TOTAL					162	173	145	10	10
APPROVED + ADDITIONAL BID TOTAL					192	280	247	108	25

This is now changed.

Table 1

A three-fold approach was adopted to restore natural features to approximately 1.5 km of the Brook. Firstly, riffles were reinstated in order to improve the in-stream habitat and raise water levels. Gravel rejects were used to build up existing riffles and to reinstate others at appropriate locations (Figures 4 & 5). Secondly, banks were regraded in order to create suitable habitats for marginal plants and to form a gradual transition between the terrestrial and aquatic habitats. Finally, groups of trees are to be planted on the south bank to provide shade (and additional habitats) and hence reduce the weed growth problem.

The scheme has been welcomed by English Nature and the Northants Wildlife Trust and will be monitored to assess its effectiveness from ecological and operational points of view.

CONSERVATION REVENUE

No conservation revenue budget existed prior to the current financial year and therefore no account of what was done could be recorded in financial terms. This position was reviewed during the year and accordingly a revenue budget was set up for use in 1992/3 which is in excess of £200k. It is anticipated that this will cover the costs of all staff throughout the Region who participate in conservation work, and is expected to be allocated as follows:-

	£k
Appraisals/Surveys	93
Management Plans/Improvements	122
External Liaison/ Promotion	40
Total	255

It should be emphasised that these figures do not cover the cost of other functions ensuring environmental considerations are fully met. Costs for the identification of conservation constraints, mitigations and opportunities are borne by the relevant function, as are the costs of environmental consultants preparing environmental assessments for the capital programme. However it is likely that the total cost of consultants is in excess of £500k.

The overall cost of conservation in the Region is very difficult to calculate as so much of the work done has conservation practices and initiatives built in. Costed against particular budgets however, will be a total figure in excess of £800K for the year.

4. OTHER CONSERVATION ACTIVITIES

(i) RIVERS ENVIRONMENTAL DATABASE (R.E.D.)

The Rivers Environmental Database is a computer based analysis, mapping and storage system for information relating to environmental features of rivers and their immediate flood plain. A three year survey programme began in 1990 and this involved collecting information on plants, birds and habitat features for each 500m length of main river.



Figure 4: Harpers Brook
immediately after
riffle restoration



Figure 5: Harpers Brook - 2 months after riffle restoration work

During 1991/92, 3874 km of main river was surveyed and the data entered on computer. The data has been used extensively within the conservation section in the following areas of work:

1. Planning of new works - as the basis for initial environmental appraisal and information at the early project design stage.
2. Dredging programme - providing baseline ecological survey information which enables the dredging programme to be planned and carried out in an environmentally sensitive way.
3. Light maintenance - to enable maintenance programmes to be formulated and carried out in a manner which protects and enhances environmental interests.
4. Catchment management plans - providing baseline ecological information to ensure conservation interests are fully integrated within the plans.
5. Planning applications/Land Drainage Consents/Abstraction Licences - assists conservation staff when commenting upon the likely environmental impact of proposed third party works.
6. Target areas for conservation management and creative conservation.

The cost of REDS is £150k per annum, and the money comes entirely from the flood defence budget, where it is seen as being a major contributor to ensuring that necessary flood defence works are carried out in environmentally sympathetic ways.

(ii) OPERATIONAL INVESTIGATIONS

There are a number of conservation orientated operational investigations which were carried out during the year. These are funded out of a regional budget and recharged back to service functions, hence water resources and flood defence functions pay the greatest contributions:-

Coastal Wildlife Survey

The Coastal Wildlife Survey was initiated in 1989 in order to provide the NRA with detailed habitat, botanical and bird information for the coastal zone.

During 1991/92 two separate surveys were undertaken:

1. Habitat and botanical surveys on 150 km of primary, secondary and cross embankments in Suffolk, Norfolk and Lincolnshire (east of Fosdyke Bridge).
2. A wintering wildfowl and wader survey of the intertidal zones of the Blackwater, Crouch and Roach estuaries in Essex.

The data is used by conservation staff to ensure protection and enhancement of the environment, primarily in the course of capital works schemes, routine maintenance programmes and when commenting on third party works on the coast.

River Wissey - Linking Hydrology with Ecology

This work was started during 1991/2 with Loughborough University as the contractors. The major objectives are to establish a greater understanding of the relationships between the hydrology of the river and its ecology in order that the water resources of the catchment can be better utilised without causing unnecessary environmental damage to either the river or the wetlands which exist in the catchment.

The study will last for three years and baseline data has been gathered for a range of sites along the river, along with preliminary hydrometric data.

River Welland Environmental Survey

1991/2 was the final year of this programme of research which was undertaken by Leicester University to examine the relationships between habitat and the invertebrates which occupy them in river channels. The work successfully demonstrated that there are close links between the diversity and biomass of invertebrates and habitat diversity and that the effects of poorly planned dredging has significant detrimental effects on both. The work also showed that it is possible to determine what the appropriate nature of a degraded river ought to be even though there may be little resemblance between the river in its current and historical states.

The importance of being able to give flood defence engineers accurate and appropriate recommendations for river restoration work will be of immense benefit to future work throughout the Region. In addition the project has been given extra funding to become part of the national R and D programme to see if the methods devised in the Anglian Region can be used in others.

Trees and the River Environment

A one year contract was let to Leicester University to assess the status of trees in the River Ouse corridor and to make recommendations for future management and planting. Following a period of intensive river management since the War, trees have been systematically removed and not replaced. This has led to very significant effects on the ecology, the diversity and the landscape value of rivers throughout the Region. Although tree planting is now carried out regularly, it is essential that it be done to produce the greatest benefits possible for the riverine environment.

(iii) RESEARCH AND DEVELOPMENT

The major piece of conservation R and D in the Anglian Region in 1991/2 was a preliminary examination of the effectiveness of conservation enhancement works carried out as part of flood defence programmes. It is absolutely essential that if the NRA is to carry out conservation work, then it must be both effective in the sense that it benefits conservation and cost-effective. The preliminary work examined the range of works which have been done throughout the NRA and established how much data was available to monitor ecological effectiveness.

This report was used as the basis for funding and a three year contract has been let to Loughborough University to establish methods and monitoring programmes.

(iv) NEW WORKS CAPITAL PROGRAMME

Conservation involvement in the capital programme before and after the changes to the procedures referred to above meant that staff were involved in over 50 programmes of work ranging from the improvement of sluice structures on the River Nene to the development of a Broads Flood Alleviation Strategy. Many of the works are located in particularly sensitive environmental areas where works and working arrangements were extremely important. For example, the Heacham Beach recharge scheme (Figure 6) was carried out during 1991 and because of the sensitivity of the area (particularly for breeding birds) a resident conservation officer was employed in order to ensure that the environmental impact of the work was minimised.

Monitoring arrangements are being set up to record the recovery of the flora and fauna; to assess any long term impacts and hence enable impacts to be minimised on similar future schemes. The transplanting of marram grass on the top crest of the beach has been planned to combat the problem of wind-blow of fines from the recharge material on to adjacent land and properties.

Of similar sensitivity is the work which is being carried out on the Ouse Washes as part of a five year programme to raise the flood defences. Installation of haul roads and raising of the barrier banks continued during 1991/92 and for the second year a resident environmental officer was employed.

A conservation initiatives document was prepared by the conservation section following extensive consultation with conservation bodies such as English Nature, RSPB and the Wildfowl and Wetlands Trust. This document provided recommendations for appropriate conservation management and enhancement works and the environmental officer was responsible for carrying out these works.



Figure 6: Heacham Beach recharge scheme

Haul road after-treatment trials were carried out to find the most appropriate method for reducing the impact of the roads on the landscape and nature conservation value of the site. A number of different seed mixes were used and these are being monitored.

Much of the capital programme is spent on coastal flood defences and there was considerable involvement of conservation constraints in this work throughout the Region. Three quarters of the Anglian coastline has some form of conservation recognition and therefore almost any work is going to be environmentally sensitive. The inclusion of conservation interests and requirements was a key part of a presentation on the Shoreline Management System at the Institute of Civil Engineers in Westminster.

5. SUMMARY OF THE NRA ANGLIAN AREAS CONSERVATION WORK DURING 1991/2

a. NORTHERN AREA

Maintenance Programme

During February and March 1992 all maintenance work for the forthcoming financial year was reviewed with district engineers and their superintendents. This produced the following proposals:

1. General agreement was reached to minimise grass cutting where possible between April and the 15th July.
2. Following on from the above: on the Wash between the Nene and the Witham, there will be a 3 year rotational cut on the bottom 2m of the landward batter of the banks and berms to assist in the colonization of the Essex Skipper butterfly.
3. There will be an increase in the length of single bank maintenance within the Northern area.
4. A reduction in the use of herbicide by approximately 20%.

Additionally, conservation staff walked 45km with superintendents in pre-dredging bank-side appraisals, and 7km were walked and agreed with superintendents to discuss bushing works, resulting in areas of managed scrub with a diverse age structure rather than block clearance.

Planning Applications

During the year the Area's capacity to increase its commentary on the conservation aspects of planning proposals was greatly increased with the employment of an Assistant Conservation Officer in February. The number of planning applications examined during the year are:-

- (i) 108 Planning Applications

(ii) 118 Water Resource Abstraction Licences

(iii) 1 Land Drainage Consent.

Conservation Initiatives

In addition to the completion of the routine duties in the Area a number of initiatives were developed in conjunction with other functional staff.

1. Riffles were created on the Glen, Great Eau and the Upper Witham.
2. By working alongside the Lincolnshire Trust for Nature Conservation a plan has been developed to re-establish the Bittern as a breeding bird at Barton Clay Pits by assisting with reedbed management, and the re-stocking of eels into land-locked pits.
3. Conservation staff had significant input into the Northern Area Drought Report for 1990/91.
4. Conservation staff were closely involved in the production of the Louth Catchment Management Plan.

b. CENTRAL AREA - BRAMPTON

Maintenance Programme

In 1991/92, 46 maintenance dredging operations were planned, all of which were subject to an environmental assessment before work commenced:-

- | | |
|---------------------------|---------------------------------|
| (i) Bedford district | - 14 operations covering 27.8km |
| (ii) Ely district | - 23 operations covering 41.1km |
| (iii) Kings Lynn district | - 9 operations covering 22.0km |

There was also continuing input into work relating to the A1-M1 link road and the effect that this would have on the Ellington and Alconbury Brook.

Proposed work on the recently en-mained Rigely Brook involved the conservation section helping to produce a plan which resulted in a light intermittent dredging operation, and a substantial amount of bank clearance work to remove fallen timber without causing unnecessary damage to the nature of the bank which is characteristically tree-lined.

Planning Applications

The ability to provide additional input to the conservation aspects of planning proposals was greatly improved with the addition of an Assistant Conservation Officer to the staff in the conservation section. During 1991/92 there were 353 planning applications in Central Area, given below.

- (i) 300 planning applications.

- (ii) 63 applications with respect to flood defence.
- (iii) 238 water abstraction licences were examined, and around 100 general enquiries were dealt with.

Conservation Initiatives

1. On the River Ivel, there was reinstatement of 4 gravel riffles at Henlow using imported material. Also a low level dry berm was created on bends. Riffle colonisation is being monitored by Leicester University, and initial results are encouraging.
2. At Ickburgh and Northwold on the River Wissey, there were 3 recharges of gravel riffles, the creation of a dry shelf using spoil to reduce channel width, and also 6 current deflectors were built using imported stone. The River Wissey is currently under study by Loughborough University as part of an operational investigation to examine the relationship between the hydrology and ecology of the catchment. The research will include an evaluation of the conservation enhancements.
3. On the River Nar, there were 2 recharges of riffles, and 4 current deflectors were created, again using imported stone.
4. Tree planting, including hedge and tree planting schemes on land NRA owned land behind the river floodbank on the Ten-Mile River.
5. Stewardship grants to restore water meadows in the flood plain of the Great Ouse in the Huntingdonshire area. Cambridgeshire and Bedfordshire Wildlife Trust carried out a preliminary survey to establish current land use and environmental value along the section.
6. There were also numerous talks undertaken, both internally and externally on the role of conservation within the NRA.

c. EASTERN AREA

Maintenance Programme

- (i) Management plans for 7 sites in NRA ownership are currently in preparation; these will help to ensure that the potential for conservation on NRA owned sites is fully met. This work includes sites at Barsham on the River Waveney and on land adjacent to the River Stour at Flatford.

- (ii) Conservation staff are participating in the production of a catchment management plan for the Stour/Gipping catchment, which forms part of the five year programme of catchment planning recently adopted by the Region. Suffolk Wildlife Trust have been contracted to produce a methodology for the conservation input into plans, which will help to guarantee full and consistent conservation aspects into management plans generally. This work will be completed in the coming months.
- (iii) The Rivers Environmental Database was used at both district and area level in liaising with operations to ensure that features of conservation value were retained and enhanced. A total of 33 maintenance dredging operations were planned for the area during the year, and wherever possible enhancements were built into the work. Of note was work carried out on the River Wensum near Gt. Ryburgh which also involved habitat enhancement and riffle construction.

Planning Applications

During the year, the Area's ability to provide commentary on the conservation aspects of planning proposals was greatly increased with the employment of an Assistant Conservation Officer. However, it should be emphasised that the capacity for the Area to cope with the very large numbers of planning applications received (in excess of 5000 in 1991/2) remains incomplete. In the Eastern area during 1991/92 conservation comments were given to:-

1. 540 planning applications
2. 225 water resources applications.

Where necessary a site visit or meeting with the developer was held.

Collaborative Projects

NRA conservation staff attended 6 of the 9 river valley and coastal projects in the Area, and consulted with various county conservation liaison panels. This helped to :

- a. maintain the profile of NRA conservation activity and;
- b. enabled the NRA to play a positive role in the implementation of project schemes, by close liaison with officers of other organisations.

With regards to publicity and media coverage, the officers in the Eastern Area were interviewed for both television and radio. Also, they undertook talks, guided walks and had input into the year's county shows.

6. PUBLICATIONS

In addition to the numerous lectures and talks given by conservation staff to conferences, universities, schools and interested groups, there were also a number of publications produced which have been published or are in press:

Harper D.M.; Smith C.D. and Barham P.J. (1991) Habitats as the building blocks of conservation. In : "River Conservation and Management" (eds) Boon P.J., Calow P. and Petts G.E. Wiley.

Barham P.J. (in press) Habitat Restoration and Fisheries. In RSPB revised handbook on river management.

Barham P.J. (in press) Fisheries survey methods. In RSPB revised handbook on river management.

J.M.Hooke and C.E.Redmond (1992). Causes and nature of river planform change. In: "Dynamics of gravel-bed rivers" (eds): P.Billi; R.D.Hey; C.R.Thorne & P.Tacconi. John Wiley. Pg 557-571.

C.E Redmond (in press) Grass and herb management. In RSPB revised handbook on river management.