

# Public Perception of Rivers and Flood Defence: Final Report

Summary of Regional and National R&D

## EXECUTIVE SUMMARY

Flood Hazard Research Centre  
Middlesex University

R&D Note 445

ENVIRONMENT AGENCY



001049



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**Dissemination Status**

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**Statement of Use**

This report summarises the results of 13 surveys of the public perception of rivers, flood hazards, flood alleviation, river management schemes, and public consultation. This information will be of interest to all staff involved in progressing not only flood defence schemes, but any scheme that affects the public's interest and requires public consultation.

**Research Contractor:**

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# **PUBLIC PERCEPTION OF RIVERS AND FLOOD DEFENCE**

## **EXECUTIVE SUMMARY**

### **1. INTRODUCTION**

The public perception of rivers, flood hazards, flood alleviation and river management schemes has grown in importance as an issue over recent years. This has been the subject of a five year collaborative research project undertaken between Middlesex University Flood Hazard Research Centre and the National Rivers Authority (NRA) Thames Region and the NRA nationally. This document presents the key findings from the project's final report 'Public Perception of Rivers and Flood Defence'. (Tunstall et al, 1994). The project has studied the relationship between the public, hazardous events such as floods, and major investment decisions, such as flood alleviation scheme designs and their implementation. It aims to provide an enhanced understanding of this relationship to enable the NRA to act sensitively and in a planned manner with regard to floods and their impacts.

The research has highlighted the value which the public places on rivers. It has shown that groups of people vary in their attitudes towards the environment and the flood risks they face. They also vary in the way they trade-off flood risk against the protection of valued habitats, and recreational and amenity areas.

This report summarises the findings from a series of 13 studies carried out between 1987 and 1993 involving extended interviews and questionnaire responses from over 3,000 residents living in areas designated as flood plains in three NRA Regions: Thames, Northumbria & Yorkshire, and South Western. Details of the separate studies and the individual study reports produced in the course of the project are given in Summary Tables 1 and 2. The report thus draws on a very substantial body of evidence, probably the largest currently available in England and Wales concerning public perception of rivers and flood defence.

The importance of the research is demonstrated by the adoption of the theme of public perception of floods within the EUROflood projects sponsored by the European Commission, which has involved collaboration between Portuguese and British researchers. At a seminar in Paris in April 1994, representatives from five Governments in Portugal, France, Germany, the United Kingdom and the Netherlands, confirmed the importance of this type of research in providing Governments and Water Management Agencies with a better understanding of the reactions of the public whom they serve.

## **2. RESEARCH OBJECTIVES**

The general objective of the project was:

- "To derive benefits for the NRA by investigating, through case studies, public attitudes to, and perceptions of, the water environment as affected by the activities of the NRA and to develop theory and methods for the prediction of these attitudes. To develop specialist survey methods and instruments for monitoring public attitudes to the river environment; including flood defence".

Five specific objectives were to examine the following:

- public awareness and perception of flood risk and flooding;
- public perception and use of rivers corridor environments;
- public knowledge of, and preferences for, river management and flood alleviation options;
- public preferences for levels of service and perceptions of the way in which the NRA carries out its responsibilities;
- information needs and public preferences for, and evaluation of, public consultation procedures.

The conclusions and recommendations relating to the specific objectives are summarised below.

## **3. CONCLUSIONS AND RECOMMENDATIONS**

### **3.1 Flood risk and flooding**

- There are pros and cons to living in a flood plain. It brings increased recreational and amenity opportunities as well as a risk of flooding.
- Although the majority of respondents were aware of local flooding in the past, for some, their perception of past flooding was inaccurate and awareness of past flooding did not necessarily translate into awareness of current flood risk. Past events were often regarded as exceptional and no guide to 'current risks'. In areas where there had been no recent experience of flooding, perception of flood risk was generally low.
- The perceived cause of flooding can be expected to influence attitudes to solutions to the flood risk. Where 'natural' causes are seen as responsible, proposals for flood alleviation schemes are more readily acceptable than where 'human induced' causes are perceived to be responsible.

- Personal experience of flooding influences perception of future flooding. Those who have experienced flooding in their homes rate the risk of further flooding more highly than those with flood water in their garden only, or those who have not had any part of their property flooded. However, people with more flood experience have often adopted coping strategies and do not rate the risk of flooding as highly as a disadvantage of living locally. Previous flood experience is used as a learning process and people feel better prepared if they are flooded on subsequent occasions.
- Although there is a wide range of perceptions as to what is regarded as serious flooding, worry about serious flooding is generally reduced by the construction of a flood alleviation scheme. Some people react strongly to flood risk by, for example, staying up all night when it rains, others accept flood risk as a natural consequence of living near a river.

## **Recommendations**

- Mechanisms to inform the public of flood risk need to be improved, particularly where there has been no recent flooding. It is therefore recommended that clear information on flood risk areas and flood warnings in a form easily understood, such as photographs or diagrams, should be made widely and freely available by the NRA to the public. This can be done through NRA offices, local authority offices, public libraries, and possibly, citizens' advice bureaux, estate agents, community centres and other public places.
- The NRA should consider the feasibility of setting up 'Flood Watch' schemes comparable to the 'Neighbourhood Watch' schemes in certain flood risk areas to raise levels of public awareness and preparedness through leafleting and other voluntary activities.
- The description of the flood risk in terms of 'return periods' of '1:200' or '1:100' confuses people and the meanings of such terms are not fully understood by the general public. Terms which are more readily understood and less confusing are needed to explain flood risk effectively.

### **3.2 River corridor environments**

- Local rivers and floodplain open spaces are important to residents for recreation and amenity. The river environment can be valued by people even though they never, or only infrequently, visit or make use of it. The use and importance of river corridors and associated open spaces will affect residents' acceptance of structural flood alleviation schemes and river management.

- People who choose to live in areas within floodplains are likely to use and value this environment more than the population generally. An attractive river is seen to increase the desirability of the neighbourhood by residents, especially those in riverside properties. Evidence indicates that people often moved to these areas specifically for the environmental benefits and, to varying degrees, they are willing to accept flood risks.
- An indicator of the importance of rivers as a *recreational* resource is the frequency of visits to them, which in the studies was high. The most important factor affecting frequency of visits is proximity to a river, with residents living nearer tending to visit on a more frequent basis than those living further away. Other factors seen to affect the use and perception of rivers and the environment generally include: age, gender, education, occupation and income.
- Recreational value of a river corridor is often dependent upon its perceived environmental qualities. River corridors rich in plants and wildlife are preferred.
- River corridors are used mainly for informal recreation, with walking (often with dogs or children) being the most popular activity. Other popular reasons for visiting rivers include for the presence of wildlife, to sit by the river and to enjoy attractive scenery.

Recommendations on this objective are combined with those of the next section.

### **3.3 River management and flood alleviation**

- The studies confirmed the importance of environmental factors in flood hazard management - expressed as a 'risk-environment trade-off'. The high value placed upon local floodplain areas can be influential in affecting residents' acceptance of proposed flood alleviation schemes and river management in general. Structural flood defence schemes that affect any local spaces, however limited their apparent landscape or ecological value may be, are likely to be of concern to some local people. This has implications for the planning and design of schemes.
- There is a major information gap among the flood plain residents regarding flood risks and flood alleviation schemes. This affects their ability to make informed choices about flood management. Furthermore, members of the public almost unanimously agree that the NRA should inform people who live in flood prone areas about the risks they face.
- While experience of flooding has been found to be an important factor in flood defence decision-making by residents, it is not a **sufficient** cause to determine a **positive** response to scheme proposals.

- Flood defence, like flooding itself, entails both costs and benefits. Those living closest to the river have more to gain from a flood defence scheme but potentially more to lose if they perceive the scheme to have a detrimental environmental impact. In many of the studies it was found that those living nearest to the river (and, perhaps paradoxically, those with greater flood experience) tend generally to show less support for flood defence schemes and those furthest from the river to show most support.
- Important factors in scheme design and the routing of channels included a range of environmental factors such as the effects on undeveloped countryside, landscape, recreational opportunities and common land rights. Specific features include bridges for the maintenance of access and rights of way, a naturally landscaped look, and trees and plants to encourage wildlife. Residents tend not to want features that will encourage an influx of visitors from outside (e.g. car parking or picnic facilities). Residents prefer 'softer' engineering approaches and favour 'natural' sloping river banks along with a variety of trees and other vegetation. 'Hard' engineering approaches such as concrete-lined channels proved to be unpopular.
- Safety aspects of flood defence schemes were often regarded as of prime importance.
- The studies showed that there had been considerable disruption for some people and for some of the time during scheme construction phases. Noise, loss of access, mud, dirt and dust, effects on privacy and security issues were commented on by respondents.

## **Recommendations**

- The NRA should undertake research to determine the level of value people - informal as well as specialised users - attach to their local areas. These values could then be taken into consideration when planning and designing future schemes to reduce possible conflicts. This research could take the form of interviews with individuals and local groups, questionnaire surveys or public meetings, for example.
- The NRA should find out what use is made of areas likely to be affected by proposed schemes to anticipate and alleviate possible conflicts by designing a scheme local residents will find generally acceptable.
- More needs to be done to inform residents in flood prone areas of the risks they face and of the options for risk management, including details of flood alleviation proposals and of constraints on schemes.
- More also needs to be done to provide advice on actions that residents can themselves take well in advance of, before, during and after flooding to protect their property. This could include suggestions for physical adaptations to property and property use and instructions to follow in the event of flooding, for example on how to floodproof property and on emergency telephone contact addresses and telephone numbers.

- Where possible, the NRA should examine the feasibility of improving or rehabilitating rivers, or stretches of rivers, that have been subject to flood defence schemes in the past. The addition of some landscaping and increased planting of vegetation around flood defence schemes would also be favoured by local residents.

### **3.4 NRA's responsibilities and levels of service**

- Many respondents were aware that flood plain development can increase flood risks. There was considerable support for various planning regulations and development control in the flood plain. NRA influence on planning and development control in flood plains is welcomed.
- Results from the studies show that the majority would be prepared to live with a '1 in 200 and 1 in 100 risk each and every year' of having their house flooded. The proportions decline with the 1:50 level of risk, although around half the respondents state that they would be prepared to live with this higher risk. Those people living with a high flood risk are likely to find any scheme providing a high level of protection of 1:100 and 1:200 unacceptable if the scheme is perceived to threaten the environmental quality of their area.
- Between 77% and 88% of residents questioned in surveys carried out between 1991 and 1993 said that they knew "very little", "nothing" or had never heard of the NRA. Few claimed to know "a fair amount" or "a lot" about the organisation. Respondents in these surveys were able to respond with some accuracy to direct questions on the main responsibilities of the NRA but they may have been guessing. However, there is still some confusion in people's minds regarding the respective responsibilities of the NRA and the Water Service Plcs.
- Public confidence in the technical judgement and expertise of the NRA in designing and implementing flood defence schemes was evident in all the surveys.
- The NRA still needs to promote and convince the public of the environmental sensitivity of its flood defence works. As concern for the environmental impact of flood defence schemes is a major factor in their acceptability, it is particularly important for the NRA to secure its reputation as an organisation that carries out flood defence works that protect and enhance the nature conservation value of rivers.
- As an outcome of the research, specialist survey instruments for use in both postal and personal interview surveys were developed for use in public perception surveys. The studies which used both quantitative and qualitative methods demonstrated the strength of this approach as well as the depth and detail of understanding that the qualitative method can yield to the NRA.

- The Contingent Valuation Method (CVM) was used in one study, the Ravensbourne River Study, to value in monetary terms the recreational benefits to the public of restoring the river. The study showed that there was support for expenditure to restore rivers. Just over half of those interviewed were able to place a monetary value of their enjoyment of their riverside park visits after restoration. The estimated recreational benefits with river restoration were substantial. This application suggests that the CVM may provide a feasible and appropriate method for the NRA to use in public perception studies to evaluate proposed changes to river environments.

## **Recommendations**

- It is recommended that the NRA undertake further publicity and public relations work to establish its own distinct image with the public separate from that of the Water Service Plcs. However, this work should be delayed until after the major institutional changes involved in the incorporation of the NRA into the proposed Environment Agency have taken place. This restructuring is likely to confuse the public further about the identities of the organisations with responsibilities in relation to water and the water environment. A major public information programme would be appropriate after that change.
- It is recommended that priority should be given to publicising the NRA's work in environmentally sensitive river management and flood alleviation schemes, since there is considerable scepticism in the public mind about this aspect of the NRA's work.
- This research and other research carried out for the NRA (House et al, 1994; ERM, 1993) provides support for the application of the Contingent Valuation Method in which respondents are asked directly to state their willingness to pay for, or the value they place on, changes in the water environment. This method should be further developed, tested and used by the NRA in public perception surveys to assess the economic benefits of proposed changes to the water environment. Postal survey methods should not be used for CVM surveys.
- It is recommended that the NRA, in future research on public perception, while building on the findings of this research, should give greater emphasis to qualitative research in order to open up, refine and deepen the understanding of the concerns of the public and to ensure that issues are explored from the perspective of the public.

### **3.5 Public consultation**

- The survey findings confirm the difficulty of mounting public consultation programmes that are effective in reaching those affected, and are satisfactory to flood plain residents.

- The majority of flood plain residents expressed a wish to be consulted early in the scheme development process, when the NRA had selected a number of options for the public to consider or earlier, and certainly before the NRA had selected a preferred option.
- The majority of respondents favoured wide consultation with both the general public direct and with representatives of organisations. There was little support for consultation restricted to representatives.
- There was support for the view that consultation should be a continuing process through all the stages of project development - from inception, through design and through implementation of a scheme
- In all cases there was strong support for consultation which took the form of a direct communication to the flood plain resident - a letter, leaflet or newsletter. These passive forms of consultation make least demands on residents but would be likely to reach the highest number of residents in the area. Conventional forms of consultation through public meetings and exhibitions also found favour with some and have a place in consultation programmes.
- The surveys show that different groups make use of, and have a preference for, different methods of consultation. The wider the range of media employed in a public consultation, the greater the impact will be and different approaches should be used as part of a consultation programme.
- Technical language and presentation can be a barrier to communication and understanding of flood defence and river management issues. Cartoons used in one consultation were well received by the public. These might provide an effective method of communication if carefully selected and used in appropriate circumstances.
- For some local people, local media - newspapers and radio - were the main or only source of information about river management and flood alleviation schemes. This highlights the importance of obtaining full and accurate local media coverage of these matters.
- The surveys show that the NRA still has some work to do to establish its reputation as an organisation that consults the general public fully and takes the public's views into account in its river management and flood defence decision making. There was considerable scepticism about the attention given to public views voiced during consultation.
- Doubts were also expressed about NRA consultation on grounds of equity. Substantial minorities felt that some of those consulted had more influence on decisions than others. Such concerns need to be considered carefully and addressed directly in designing and implementing consultation programmes.

- Many of those interviewed belong to environmental and amenity groups and have taken part in community activities. It is important that these 'community activists' are not alienated during flood defence scheme development but are included into decision making where possible to engender a 'partnership approach'.

## **Recommendations**

- Public consultation programmes need to be designed with the needs of different groups in mind. A variety of methods, leaflets, newsletters, letters, local media coverage and notice boards on site, as well as public meetings and exhibitions, should be used in order to cater for the needs of different groups.
- Information should be made available to the public on two levels. Language and visual aids that are not too technical and which are clearly understandable to non experts are required for many consultees. More detailed technical information should be made available to those members of the public who are interested in it.
- It is recommended that the NRA, as part of its programme to develop such material, should undertake research to test the effectiveness of informational material in communicating to the general public on flood risks and river management proposals.
- Early, wide and continued consultation and skills in communication will mitigate much of the concern of local residents regarding river works. These skills need to be taught to NRA staff where required.
- The NRA should consider the feasibility of setting up a 'local forum' to liaise with local people and to exchange information and views. A staff member should act as a local liaison officer where major changes to the river environment are under consideration.
- The NRA should consider undertaking further research to evaluate its consultation procedures in detail when an opportunity arises.

## **4. IMPLEMENTATION**

The recommendations resulting from these surveys have far reaching implications not only for Flood Defence personnel but for all NRA personnel involved in scheme design and implementation and with the public. In order to put these recommendations into practice the following course of action is suggested:

- Presentations of the findings of these studies is to be given at Thames Region and Northumbria & Yorkshire Region offices to invited personnel from all NRA Regions.
- The NRA has growing experience of public consultation. In order to enhance the

effectiveness of their programmes, there appears to be scope for regions to pool their experience on consultation techniques through workshops or a coordinating group. . There might be scope to develop guidelines on public consultation on the basis of NRA experience so far. Some local authorities have developed guidelines of this kind which might serve as a model.

- It has been noted that public consultation occupies a growing and significant proportion of flood defence engineers' time and yet staff receive no training in the skills required (Fordham, 1992). The NRA should consider mounting such training courses and the development of guidelines, since effective public consultation programmes assist in avoiding delays and conflict. Since consultation programmes are a key way in which the public comes into contact with the NRA, consultation processes may have an important role to play in building public awareness and confidence in the work of the organisation.
- A paper on the project will be presented at the MAFF Conference of River and Coastal Engineers in July 1995.

1.12.1994

**Summary Table 1: Surveys (mainly) undertaken as part of the Project on the Public Perception of Rivers and Flood Defence.**

Date of Survey	Stage in the river management and scheme development process						
	Baseline Study Stage		Project Planning Stage		Post-project Stage		
	No	After*	No	After	No	After	
	Recent	Recent	Recent	Recent	Recent	Recent	
	Flooding	Flooding	Flooding	Flooding	Flooding	Flooding	
1987		Waltham Abbey Survey <sup>1***</sup> (123)					
1988			Eton Wick Survey <sup>2</sup> (198)				
1989	(Thames Perception and Attitude Survey) <sup>3</sup> (494)						
1990		Postal Survey <sup>4</sup> (614)		Maidenhead Flooding Survey <sup>5</sup> (198)		Lower Colne Survey <sup>6</sup> (180)**	
						Lower Stour (Christchurch) <sup>7</sup> Study <sup>***</sup> (13)	
						West Bay Study <sup>4</sup> <sup>***</sup> (4)	
1991						River Ravensbourne Survey <sup>9</sup> (709)	
1992						River Mole Scheme Survey <sup>10</sup> (233)	
1992							York Study <sup>11</sup> <sup>***</sup> (22)
1993				Upper Kennet <sup>13</sup> (199) <sup>****</sup>		York Survey <sup>12</sup> (307)	

\* After recent flooding: within 12 months of a flood event in the area

\*\*\* Long qualitative interviews. Study financed from academic sources not by the NRA.

( ) Number of interviews/cases shown in brackets

\*\* Survey not formally part of the Public Perception of Rivers and Flood Defence Project

\*\*\*\* River management issue investigated in this study was low flows in the river not flood defence as was the case for all the other studies'

' Superscript number refers to Project Reports listed overleaf

**Summary Table 2: Reports of the Project on Public Perception of Rivers and Flood Defence**

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- 1 **Waltham Abbey and Thornwood, Essex: An assessment of the effects of the flood of 29th July, 1987 and the benefits of flood alleviation.** Tunstall, S.M. and Bossman-Aggrey, P. (1988). Final Report to Thames Water Authority. Enfield: Flood Hazard Research Centre.
- 2 **Eton Wick: A survey of residents' perceptions of flood risk and flood alleviation schemes.** Tunstall, S.M., Fordham, M., Glen, C. (1994). Final report to the National Rivers Authority Thames Region. Enfield: Flood Hazard Research Centre.
- 3 **Thames Perception and Attitude Survey Datchet to Walton Bridge.** Tunstall, S.M., and Fordham, M. (1994). Final report to the National Rivers Authority Thames Region. Enfield: Flood Hazard Research Centre.
- 4 **The River Environment and You Postal Survey: Datchet to Walton Bridge.** Tapsell, S.M., Fordham, M., Tunstall, S.M. and Horne, M. (1994). Final report to the National Rivers Authority Thames Region. Enfield: Flood Hazard Research Centre.
- 5 **Flooding in the Maidenhead area in February 1990 and its effects.** Sangster, E., Doizy, A. and Tunstall, S.M. (1990). Draft report to the National Rivers Authority. Enfield: Flood Hazard Research Centre (Restricted availability).
- 6 **Customer Perception in the Lower Colne Valley.** Wigg, A.H. and Tunstall, S.M. (1991). Draft final report to the National Rivers Authority Thames Region. Enfield: Flood Hazard Research Centre.
- 7 **A Case Study of Residents Attitudes to the Lower Stour Flood Defence Scheme, Christchurch, Dorset.** Fordham, M. (1991). Enfield: Flood Hazard Research Centre (Restricted availability).
- 8 **An Examination of Attitudes to the Bridport Flood Alleviation Scheme: Stage 1C, West Bay, Dorset.** Fordham, M. (1991b). Draft final report to the National Rivers Authority. Enfield: Flood Hazard Research Centre (Restricted availability).
- 9 **Ravensbourne River Queen's Mead Recreation Ground Survey.** Tapsell, S.M., Tunstall, S.M., Costa, P. and Fordham, M. (1992). Final report to the National Rivers Authority Thames Region. Enfield: Flood Hazard Research Centre.
- 10 **River Mole Flood Alleviation Scheme Survey.** Tapsell, S.M. and Tunstall, S.M. (1994). Final report to the National Rivers Authority Thames region. Enfield: Flood Hazard Research Centre.
- 11 **Public Perception of flooding and flood defences in York.** Tapsell, S.M. and Tunstall, S.M. (1992). Interim Report to the National Rivers Authority Thames Region. Bristol: National Rivers Authority.
- 12 **Public Perception of Rivers and Flood Defence: Flooding and Flood Defences in York.** Tapsell, S.M., Tunstall, S.M. and Fordham, M. (1993). National Rivers Authority R&D Note 213. Bristol: National Rivers Authority.
- 13 **Upper Kennet Public Perception Report.** Sawyer, J. and Fordham, M. (1993). Final report to the National Rivers Authority. Enfield: Flood Hazard Research Centre.