

# **SITE APPRAISAL FOR RIVER RESTORATION**

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# **SITE APPRAISAL FOR RIVER RESTORATION**

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## **SUPPLEMENT TO REPORT**

Eleven Site Inspection Notes were prepared during the process of the appraisal of sites for consideration by the RRP. These are recorded in a Supplement to this Report.

# THE RIVER RESTORATION PROJECT

## SITE APPRAISAL FOR RIVER RESTORATION

### SUMMARY

This report covers the preliminary appraisal of seventeen potential sites for river restoration. Phase 1 of the River Restoration Project's Business Plan: The LIFE Demonstration Project, provides for the restoration of two rivers, one rural and one urban; the following are considered to be best suited following appraisal:

**River Cole:** A 2km rural reach located at Coleshill to the north- east of Swindon in National Trust ownership.

**River Skerne:** A 1.2km semi-urban reach on the north-east side of Darlington, in Borough Council ownership.

A methodology for the appraisal of potential sites for river restoration has been developed and applied. It suited the RRP's site selection process well and is sufficiently flexible for adaptation to other situations.

The methodology comprises three stages:

- Individual site inspection and report.
- Appraisal of individual site potential against predetermined criteria; allocating numeric scores to sites.
- Comparison of sites; site selection.

The report concludes that appraisal for restoration is best undertaken by a multidisciplinary team, each member of which is familiar with the sites under consideration. Reliance upon informed judgments is important since the appraisals are of a preliminary nature and precede any detailed site investigations.

The appraisal process is designed to enable one site to be compared with another on a like-for-like basis. The process enables follow-up investigations to be targeted with an acceptable level of confidence.

# **SITE APPRAISAL FOR RIVER RESTORATION**

## **1. INTRODUCTION**

### **1.1 The River Restoration Project (RRP)**

The RRP is an independent company established to promote river restoration within the UK. Its Business Plan (1993) sets out its aims and objectives fully; the summary of the plan is included as Appendix 1. Phase 1 of the plan comprises the restoration of two reaches of river, one rural and one urban. The selection of these two sites, from a range of possibilities, is the primary output of this report, but a methodology with potential for wider application has been derived.

### **1.2 Specific Aim of the Report**

Investment in the restoration of rivers is constrained for a variety of reasons which suggest that it needs to be targeted very carefully to ensure the best returns. A rational approach to selection of sites for restoration is likely to prove to be essential to the decision-making process where a range of alternatives exist.

English Nature appointed the RRP to develop a site appraisal methodology with the following aim:

The aim is to produce an effective and easy-to-use methodology for selecting stretches of river and floodplain for restoration. The system should be designed to meet a stated objective, i.e. to restore, as far as possible, natural features of rivers and their floodplain. The methodology needs to assess the cost-benefit in environmental terms of carrying out certain types of restoration work and maintaining them thereafter.

The full Brief is included in Appendix 2.

The methodology developed is targeted towards the selection of two sites for the RRP's demonstration project but is considered to have the potential for further development to suit the specific needs of other restoration programmes.

## **2. THE METHODOLOGY FOR SITE APPRAISAL**

The methodology developed is based upon a three-stage approach to the selection of sites for restoration, viz:

1. Individual site inspection and report.
2. Appraisal of individual site potential against predetermined criteria; allocating numeric scores to sites.
3. Comparison of site; site selection.

Each stage is explained below.

### **3. INDIVIDUAL SITE INSPECTION REPORTS**

The purpose of site inspection is to observe and record site-specific information relevant to its potential for restoration. This may be a partially subjective exercise, the value of which is dependent upon the experience and judgment of those involved; a multi-discipline approach is therefore desirable. Prior research of all published data is helpful in reducing the need to be subjective.

A preliminary view of the potential shape of restoration needs to be taken and recorded.

The report should be based upon information that is readily available and should not lead to excessive research or additional survey etc. It will be used to evaluate one site with another; only if selected for restoration will the site need to be evaluated in full detail. Some information, e.g. NWC Water Quality Classification will, however, be essential.

A report format has been developed, an example of which is included as Appendix 3.

The RRP considered five rural sites and 12 urban. Inspection notes were prepared for eleven of these sites; the others being eliminated on the basis of constraints in terms of meeting RRP's needs that were self-evident upon inspection.

These notes are included in the supplement to this report.

## 4. APPRAISAL OF SITES

The aim of appraisal is to express the 'value' of the site in a way that enables meaningful comparison with other sites to be made on a like-for-like basis. This is achieved through systematically ascribing numeric scores against predetermined criteria. The higher the score, the greater the potential value of the site.

A form for site appraisal has been developed and is included as Appendix 4. Figure 1 provides an example of a scored sheet taken from the form.

### 4.1 Site Selection Appraisal Form

#### 4.1.1 Rationale

Appraisal is undertaken against the following six broadly defined parameters:

1. **Aims:** the site must offer the potential to achieve the broad aims of river restoration, involving both the river and its floodplain, with benefit to wildlife, landscape, recreation and amenity, and to any local heritage features.
2. **Technical:** the site-specific project must illustrate a wide range of degradations that can be reversed, measured, and developed with confidence in the future. Reversibility must be technically achievable and the results capable of interpretation.
3. **Funding:** the site-specific project envisaged must be capable of being funded on an adequate and secure basis that ensures both its short- and long-term economic viability through effective funding partnerships.
4. **Ownership:** owners and occupiers must be committed to the aims of restoration and must be able and willing to play their full part in achieving these with minimal negotiation.
5. **Promotional:** the site-specific project must serve to support the RRP's wider aims of influencing, through demonstration, the rate and extent of achievement elsewhere and to advance knowledge and understanding of restoration techniques.
6. **Risks:** in so far as may be reasonably practical, the risk of failure associated with any aspect of the envisaged project should be capable of being controlled by the RRP or its funding partners and should be intrinsically small.

#### 4.1.2. Specific criteria for appraisal

Each of the above considerations is defined in detail through a series of specific measures (125 in all) against which compliance can be assessed. The measure of compliance is simply expressed; one of four boxes is ticked. Compliance is either Excellent, Good, Fair or Poor.

Not all criteria will be relevant to all sites, in which case they should be deleted. Deletions should, however, be few in the case of any site where comprehensive restoration is sought.

The pattern of ticks should give an immediate indication of the strengths/weaknesses of the site. A bias to the right indicates below average value in any particular area and conversely in the case of a bias to the left.



FIGURE 1. Example of scored page from Site Appraisal form.

Maximum score allocated to Section 2 was  $5 \times 4 = 20$  points total.  
In practice 5 x 20 points used and total divided by 5 for summary.

2. TECHNICAL		EXCELLENT	GOOD	FAIR	POOR
Does the site readily offer scope for the physical reversibility of degradation to restore a wide range of environmentally beneficial features?					
<b>2.1 INSTREAM</b>					
Restoration of features appropriate to the natural regime:					
Meandering of straightened channels		✓			
Narrowing of over-widened channels			✓		
Re-profiling of bed, pools, riffles etc.			✓	✓	
Reinstatement of lost substrate, gravels etc.			✓	✓	
Reinstatement of off-river features (e.g. backwaters, bays)		✓			
Other ( <i>Improving mill pool</i> )		✓			
Removal of undesirable impoundments, structures, revetments etc.					✓
Addition of features appropriate to an artificial regime:					
Impounding weir/sluices					
Flow diversion sluices					
Lakes, ponds, leazes					
Reed beds/silt traps					
Marginal shallows					
Other ( )					
COMMENTS:		Maximum Score		18	
<i>NB This assumes that regime associated with water mill can be retained.</i> <i>From a morphology point of view river restoration can be sustainable because the bedrock is generally Oxford Clay throughout, overlain by alluvium. Area is interesting geomorphologically.</i>		20			
<b>2.2 RIVER BANKS</b>					
Introduction of:					
Naturally varied profiles, cliffs, ledges, berms etc.		✓			
Naturally varied alignments			✓		
Water edge trees (e.g. alder, willows)		✓			
Zonal vegetation; damp/dry		✓			
Safe access to water's edge for animals (e.g. otters; people)		✓	✓		
Naturally sustainable revetment techniques					
Other ( )					
Removal of undesirable revetments					✓
Eradication of invasive plants, e.g. Japanese knotweed					✓
COMMENTS:		Maximum Score		16	
<i>Site has potential to demonstrate wide range of features.</i>		20			

Version 2.2

#### **4.1.3 Numeric scoring**

The next stage of appraisal is to allocate a numeric score that reflects the trend indicated by the tick boxes. Each of the six sections (4.1.1 above) is firstly allocated a potential maximum score that reflects the relative importance and weighting of each. The RRP allocates maximum scores totalling 100, broken down into 20, 20, 15, 15, 15, 15 for 1-6 respectively.

The potential maximum score for each section can be further subdivided, for example: Section 2, Technical: maximum score allocated = 20. There are five parts to Section 2; each part could be allocated four points, giving the required total of 20 if each is considered equally weighted.

The RRP chose to evaluate each part of Section 2 against a score of 20, then divided the total by five to achieve the same result but with, perhaps, finer definition.

The allocation of actual scores against the potential maximum must reflect the trends apparent in the tick boxes.

A comments box is provided against each score to record any critical consideration that has influenced it. This is important because the whole process is based very much on informed judgments that may need to be qualified.

#### **4.1.4 Totalling scores**

A single page summary is provided upon which all scores can be brought forward and totalled. These scores need to be examined one with another to ensure that they properly reflect the overall characteristics and potential of the site. If not, provision is made for adjustment (+ or -) but these require explanation in the comment box provided.

#### **4.1.5 Final score**

Finally, the overall total (adjusted if necessary) needs to be examined in its own right to ensure that it is appropriate. This too can be adjusted and an explanation given and a final score allocated. A brief overall assessment should be written against the final score to provide an 'at a glance' picture of the site's potential for restoration.

A cover sheet records locational details of the site and the scoring panel membership as well as the outcome of the appraisal.

## **5. SITE SELECTION**

The objective of site evaluation is to enable several sites to be compared, one with another, on a rational basis. This leads directly to site selection.

The RRP undertook this comparison with the assistance of NRA staff who were familiar with the sites under consideration. Representatives of English Nature and Countryside Commission were able to contribute a useful overview, although not familiar with the sites.

Site appraisals had been scored by individuals, or by a group in the case of RRP. Scores were brought together for comparison and the results shown on Table 1 (Rural) and Table 2 (Urban).

Appendix 5 gives a fuller account of the site selection meeting referred to above.

### **5.1 Selection Procedure**

The following is suggested as a basis for selection in ideal circumstances:

- The methodology described in Section 4 above should be developed to ensure it meets the specific needs of the restoration programme under consideration. (The RRP's requirements are unlikely to be fully representative.)
- Sites should be appraised and scored by a panel that affords a range of expertise, each member being familiar with the sites under consideration (this was not wholly so for RRP).
- A consensus view must prevail throughout the appraisal process.
- The panel should not continue with selection of sites immediately after appraisal. A break is desirable to assimilate the views expressed and the results derived.
- A site selection panel should be convened to address this single task. Appraisal results should be available to each panel member in advance of the meeting.
- The site selection panel could, with good effect, be constituted differently from the site appraisal panel. Objectivity may be strengthened by this means.
- The process of selection should be influenced by the appraisals and the scores derived from each site, but not necessarily dictated by them. Structured discussion should be sought to arrive at an overall consensus and a result that each member can support.
- The role of the chair in the site selection process is of particular importance; a degree of independence from the result may be beneficial. The objective of the chair should be to assist panel members in arriving at a consensus, not to influence the outcome or be seen to make the decision in the event of difficulty in arriving at a consensus. This was the case during the selection of RRP's preferred sites.

**THE RIVER RESTORATION PROJECT**  
**Phase 1: EC LIFE DEMONSTRATION PROJECT**  
**SITE APPRAISAL SUMMARY - List 1; RURAL**

**Table 1**

REFERENCE	SITE	AIMS	TECHNICAL	FINANCIAL	OWNERS	PROMOTION	RISKS	TOTAL	SCORED BY
		20	20	15	15	15	15	100	
R1	R. COLE at Coleshill nr Swindon: 2 km reach on N. Trust estate.	19 19	16 19	14 14	13 15	13 15	14 11	89 93 76	JB:NH:RV AD/VL AB
R2	ELLINGTON BROOK at Ellington, west of Huntingdon 2 km reach at site of proposed gravel extraction.	17	14	13	12	9	10	75	JB:NH:RV
R3	THAME at Aylesbury 2km reach d/s of S.T.W. to weir	14 20	14 15	10 17	77 13	10 13	8 10	63 88 75	JB:NH:RV VL AB
R4	WAVENEY nr Diss, Norfolk Various reaches within 12km above A140, Scole Br.	* Reach not sufficiently typical for demonstration purposes				*		N/A	RV
R5	OCK nr Abingdon, Oxon. Various reaches d/s of A338, Garford.	* Owner unable to make commitment - not scored						N/A	RV
R6									
<b>COMMENT</b>  The COLE has been consistently scored in the upper quartile. The owners, National Trust, are considered excellent partners both short and long term. This factor led to unanimous agreement that the COLE should be carried forward as a preferred site.									

**THE RIVER RESTORATION PROJECT**  
**Phase 1: EC LIFE DEMONSTRATION PROJECT**  
**SITE APPRAISAL SUMMARY - List 2; URBAN**

**Table 2**

REFERENCE	SITE	AIMS	TECHNICAL	FINANCIAL	OWNERS	PROMOTION	RISKS	TOTAL	SCORED BY
		20	20	15	15	15	15	100	
U1	ALT: Huyton, Liverpool 0.5km reach adj. Jn3 of M57 motorway.	13	15	10	14	13	12	77 80 72	JB:NH:RV NG AB
U2	SKERNE; Darlington 1.2km reach d/s of Haughton Bridge.	15 16 14	14 16 15	11 12 11	15 15 15	12 14 13	13 13 13	80 85 81	JB:NH:RV O M CB
U3	WHITTLE BROOK; Gt Sankey Warrington; 1 km reach d/s of Barrow Hall Br.	9						- 78 73	JB:NH:RV N G PN
U4	HERMITAGE STREAM Havant; various u/s of railway.	9 10	15 12	13 12	15 14	11 11	11 11	74 70	JC M C
U5	HOGSMILL; Ewell, Kingston on Thames; various u/s of railway.	19	19	12	15	15	10	76 90	AB AD
U6	Medlock; Manchester								
U7	Sutton Bk; St Helens	NOT SCORED - sites are not							
U8	Mill Bk; St Helens	considered to be sufficiently							
U9	Lustrum Beck; Stockton-on-Tees	good to enable the aims of							
U10	Lustrum Beck; Mt Pleasant	the LIFE project to be							
U11	Don; Baldon, Sth Tyneside	achieved.							
U12	Erewash; Toton, Nottingham								
<b>COMMENT</b> Hogsmill eliminated as COLE (preferred rural site) is in same NRA region. Hermitage and Whittle Brook scored low on achievement of 'aims'. Unanimously agreed that SKERNE marginally more suitable than Alt as preferred urban site.									

## **6. RRP PREFERRED SITES**

The outcome of the appraisal and selection process undertaken by the RRP and its partners was to determine two 'preferred sites', viz:

Rural: River Cole at Coleshill near Swindon  
Urban: River Skerne at Darlington

The term 'preferred site' is designed to reflect the fact that much of the decision-making process is only based upon the best information available. The viability of the decisions reached must be verified through a more rigorous evaluation of the preferred sites before commitments are made. Assumptions and judgments need to be tested.

Within the NRA the follow-up to the selection process described would probably be that of 'Outline Appraisal' as defined in its Scheme of Delegation for Capital Works.

Outline appraisal leads to the inclusion of a scheme of works in a capital programme, preliminary budgetary provision and a commitment to expenditure on a Detailed Appraisal. It is only after this later stage that a formal commitment to proceed can be made.

This process is logically based and lends itself to collaborative projects in which partners need to develop their involvement progressively. The extent of commitment is increased in measured stages as a full business case is developed.

## 7. CONCLUSIONS

1. The appraisal of sites for river restoration needs to be undertaken against a comprehensive set of criteria upon which the success of the envisaged project depends.
2. It is unlikely that sufficient information will be readily to hand to enable fully accurate evaluations to be made against all of the criteria selected. Experienced judgments will necessarily play an important part in the appraisal process. ✓
3. These judgments need to be shared through the establishment of a multidisciplinary group. To undertake appraisals, members should be familiar with the sites under consideration.
4. The criteria selected by the RRP should be widely applicable to other river restoration programmes. The methodology developed for the evaluation was found, in practice, to be workable. It ensured that all sites were considered against common measures on a like-for-like basis.
5. The output of the appraisal process is designed to enable one site to be compared with another. The lack of comprehensive information at this preliminary stage precludes the achievement of an appraisal that is sufficiently robust to support firm investment decisions. The preferred sites selected need to be investigated in detail; the appraisal methodology developed enables this work to be targeted with an acceptable level of confidence.

**APPENDIX 1 RIVER RESTORATION PROJECT BUSINESS  
PLAN (1993) - SUMMARY**

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## 1. SUMMARY

### *i) Aim of the business plan*

- The Business Plan is a working document for the RRP, forming the basis of work plans and action plans which will set time scales and targets for the phases of the overall project.
- The Business Plan provides existing and potential partners and sponsors with information about the aims, timescales and costs of the overall project.

### *ii) Project phases*

- Phase 1: The EC Demonstration Sites project, part-funded by the LIFE programme. This project will establish two major restoration demonstration sites in UK and one in Denmark.
- Phase 2: The 'Partnerships for Restoration' project. This project is a UK initiative, investigating methods for developing model partnerships to promote river restoration.
- Phases 3 & 4: The establishment of a 'restoration network' and the dissemination of information about river restoration. Some initial work on these two projects will form part of the LIFE project.

### *iii) Costs*

The total cost of Phase 1 is £875,000. It is anticipated that this will be funded in the following proportions:

EC LIFE funds:	£350,000
LIFE partners:	£350,000
Other sponsors:	£175,000

Phase 2 is now being planned. The first stage of this phase has been completed at a cost of £8500.

The two later phases of the project (Phases 3 and 4) are planned to be largely self financing.

### *iv) Timetable*

Phases 1 and 2 of the project will run from January 1994 to December 1996. Some early stages of Phases 3 and 4 will commence in January 1994.

### *v) Outputs of the Project*

The main outputs of the RRP will be:

- the establishment of two fully monitored demonstration sites showing state of the art restoration techniques.
- monitoring of the benefits of restorations in terms of nature conservation, water quality, fisheries, visual amenity, land drainage and the costs of river management.
- partnerships with other organisations and individuals involved in river restoration.
- an international river restoration network.
- literature on the techniques and benefits of river restoration.

## **APPENDIX 2**

### **ENGLISH NATURE PROJECT: SITE APPRAISAL FOR RIVER RESTORATION**

#### **Rationale**

1. River restoration is a developing concept, whose aim is to recreate more natural rivers and floodplains - as habitats for wildlife and as amenity and landscape features. Very little work has been done in this country, other than some "cosmetic" local authority/NRA schemes in urban areas. The River Restoration Project was launched as a pioneering venture in December 1992. It was recently awarded a European Community LIFE grant to undertake demonstration restoration projects on two rivers in the UK.
2. English Nature, the Countryside Commission and the National Rivers Authority are all very interested in the concept of river restoration. We are looking, in the long term, towards a national programme for river restoration in partnership with these and other bodies. In the immediate future, we wish to see the EC LIFE funds used effectively to give river restoration a flying start. This means that site selection, techniques and value-for-money are key elements of the demonstration project.

#### **Objective**

3. The aim is to produce an effective and easy-to-use methodology for selecting stretches of river and floodplain for restoration. The system should be designed to meet a stated objective, i.e. to restore, as far as possible, natural features of rivers and their floodplain. The methodology needs to assess the cost-benefit in environmental terms of carrying out certain types of restoration work and maintaining them thereafter.

#### **Specification**

4. The product of this project will be a methodology and a report on site appraisal for river restoration in connection with the EC LIFE demonstration project. This will contain individual site appraisals and preferred options for restoration work.
5. This project should be undertaken in consultation with English nature, Countryside Commission, Countryside Council for Wales and Scottish Natural Heritage. Meetings should be held with EN, CC and NRA to discuss the draft report.
6. Proposed criteria should be circulated by 10 January 1994; a draft report should be submitted by 3 February and a final report by 24 February 1994.
7. Three printed copies of a final report should be provided to English Nature and a further 20 produced for distribution to other organisations.

#### **Timing and payments**

8. One-third of the contract price will be paid to the contractors on receipt of the draft criteria, a further third after the meeting to discuss the draft report, and the remainder on receipt of the completed report.

#### **Nominated Officer**

10. The nominated officer for this project is David Withrington (Freshwater Policy Officer, English Nature, Northminster House, Peterborough, tel: 0733 318450).

**English Nature  
Peterborough**

**30 November 1993**

## APPENDIX 3 SITE INSPECTION NOTE - EXAMPLE

THE RIVER RESTORATION PROJECT PRELIMINARY SITE APPRAISAL	INSPECTION NOTE NO.
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River:	COLE	
Location:	COLESHILL:	Between Highworth and Faringdon
Date Inspected:	October 1993	
Present:	Richard Vivash Alistair Driver Andrew Brookes Nigel Holmes subsequently	
Contact Names:	Richard Vivash/Alastair Driver	
Address:	Alastair Driver: Thames NRA	
Prepared by:	Nigel Holmes	
Supporting Documents:	NRA historical and catchment water quality, discharge, invertebrate and flood defence engineering design. Very detailed information on history from National Trust.	

## 1. BACKGROUND

The River Cole has been identified as a potential restoration site for many reasons, including the following:

- a) more than 2km of river and floodplain is in the ownership of the National Trust - initial discussions with them confirm a desire for the site to be selected having canvassed tenant farmers.
- b) the river illustrates a wide range of degradations - deepening, widening and straightening with an impounded length feeding a mill of great heritage value.
- c) remnants of natural water course remain and there are places within the floodplain where extensive wetland and watercourse restoration could take place.
- d) the landownership is stable, thus securing RRP's investment if selected.
- e) excellent opportunities to create, and restore continuity of river and floodplain habitats as well as restore the old meanders cut off centuries ago.
- f) location is good with potential to extend upstream and downstream into private ownership land.

## 2. GENERAL RIVER CHARACTERISTICS

- a) **Physical:** The Cole is a tributary of the Thames, joining it circa 8km downstream at Lechlade. It is in a catchment of mixed geology with clay an important component. The site has a wide flat valley above the B4019 bridge with the upstream limits flowing through a narrow, steep-sided valley. A tributary confluence is a feature of the site where both channels have been straightened and become impounded. Because of the impounded reach, land drainage from the east is via a siphon under the channel which links to a remnant loop of the natural channel which takes overspill flows. Below the bridge the river has been straightened and deepened; the bed has diverse features but the banks are degraded.
- b) **Flood Defence:** The Cole has been subject to a major agricultural improvement scheme and regular heavy maintenance. Above the bridge the land is in pasture but below the land is mostly arable due to the freeboard resulting from flood defence works to protect the road and village.
- c) **Water Quality:** NWC Class 2/3 - Thames NRA to advise. Subject to periodic pollution events as Swindon is within its drainage basin and agricultural run-off is important from the eastern tributary.
- d) **Water Quality:** Abstracted from the catchment not known - Thames NRA to advise.
- e) **Environmental:** Biological sampling sites (details available but not to hand) indicate a very diverse aquatic environment below the bridge and good water quality in recent samplings. Fishery interest - to come from TNRA. A meadow SSSI is present downstream of the bridge which supports an ancient alluvial natural grassland community.

## 3. SITE INSPECTION NOTES

The river has been straightened, impounded and widened above the bridge; flood flows are discharged through a segment of tortuously meandering old channel which has also been deepened. Below the bridge a new channel was probably cut many centuries ago when the mill was built; this has now been deepened and widened. Few trees are present along the featureless impounded channel but there remain remnants of the old course with sentinel willows still present guarding ponded water.

There is virtually no riparian zone.

## 4. POTENTIAL FOR RESTORATION BY RRP

The potential for restoration and rehabilitation is great and is summarised below and on the attached Figure.

1. **Ditch habitat:** In the floodplain ditch alongside Waterloo Copse and traversing the wet grassland before discharging through a siphon under the river could be re-cut in a meandering course, given variable depths and bank profiles, fed through a small reedbed to enhance water quality and planted along its edges with wetland plants and a few trees to create a buffer corridor of wildlife and landscape interest.
2. **Old course:** This could be re-excavated and a meander loop backwater created which connected up with the remnant channel present now.
3. **Catchment channel from Waterloo Lodge:** Either the existing straight channel could be re-cut and joined up with the original channel (3a) or re-meandered (as described in 1) along the present straight line (3b).
4. **Reedbed for wildlife and potential water quality improvements:** A reed bed, through which the Waterloo Lodge stream would flow during low to medium flows, could be created in the floodplain; location dependent on several factors, not least whether option 3a or 3b implemented.
5. **Floodplain wet grassland and ditch systems:** Either on the left or right bank of the floodplain opportunities for creating a variety of floodplain wetlands are good because of the retained head. These would require grazing to be of interest in the long term and therefore only a small area would not still be in agricultural use.

6. **Re-profiling retained river:** Enhancement of the physical diversity of the channel (especially the margins) would be executed with minimal loss to land in production. Some planning of species previously present might be undertaken.
7. **Re-excavation of old channel:** The old channel is clear on historic maps and visible still today on the ground; the plan would be to restore it and create very varied habitats utilizing the head which exists from the impounded straight channel. Flows would be shared between the old and new channels.
8. **Floodplain wetland creation:** As for 5 on the east bank, utilizing the head from the new channel to feed ditch systems to 'feed' and 'drain' the floodplain and create a rich mosaic of habitats.
- 9/10. **Old channels:** Some habitat enhancement (but not great) on the channel cut from the siphon and straight impoundment channel (9) and the natural old channel (10) into which these, and the newly restored old channel, would discharge.
11. **River corridor creation:** The historic new cut below the bridge has good submerged habitat but very poor bank and corridor features. Re-profiling of one bank might be extensive to create marginal reedbeds and along both sides large areas might be planted with trees and shrubs to form a wide river corridor of landscape and wildlife value.
12. **Ditch outfall:** At the outfall a reedbed and wetland habitat might be created for wildlife enhancement and improving water quality.
13. **Old channel:** If the head from the mill pond could be utilized the old channel might be partially restored to create historical, ecological and wildlife interest.
14. **Drainage channels:** could be utilized for creating habitats in the adjoining fields of variable wetness (all kept in agricultural use).
15. **SSSI rehabilitation:** the SSSI meadow might be enhanced through a combination of water regime manipulation and management.

## 5. OVERALL ASSESSMENT

A site demanding very careful consideration as the LIFE demonstration site. Even if not selected, it is a good example of where RRP could develop its Partnerships for Restoration role with one of the major landholders in the UK.

## 6. CONCLUSIONS

1. A very strong contender for LIFE selection on what it has to offer alone; candidature has benefit of partnership with a major landholder but against this is the criticism that could be seen as 'this is not the real world situation as it is the National Trust'.
2. Possible disadvantage seen is the fact that pollution incident from Swindon could undo all monitoring and benefits for in-channel interests for a long time.
3. Strong plus point is potential to build in measurable water quality improvements.
4. Restoration of old channel is possible but much of the river will not be restored in its geomorphological sense.

## **APPENDIX 4 SITE APPRAISAL FORM**

## The River Restoration Project Phase 1:

LIFE Demonstration project

"River restoration: benefits for integrated catchment management"

### SITE SELECTION APPRAISAL

<b>RIVER</b>	
<b>Reach</b>	
<b>Location</b>	
<b>Urban/rural</b>	
<b>Catchment</b>	

<b>Appraisal panel</b>	
<b>Name:</b>	<b>Representing:</b>
1	
2	
3	
4	
5	
6	
<b>Final Site Score</b>	

<b>Panel Chairman</b>	
<b>Signature</b>	
<b>Date of appraisal</b>	
<b>Chairmans comments</b>	

Version 2.2.

SUMMARY SHEET		RIVER/ SITE		
Parameters	b/f max possible	b/f assessed	Adjustment	Adjusted score
<b>1. Achievement of aims</b>				
1.1 Aims				
Sub-total				
<b>2. Technical</b>				
2.1 Instream				
2.2 River banks				
2.3 Riparian corridor				
2.4 Floodplain				
2.5 Use of river/floodplain				
Sub-total				
<b>3. Financial</b>				
3.1 Value for money				
3.2 Funding partnerships				
Sub-total				
<b>4. Ownerships</b>				
4.1 Land owner interest				
4.2 Land occupier interest				
4.3 Other owner/occupier interest				
4.4 Public interest				
Sub-total				
<b>5. Planning and promotion</b>				
5.1 Planning and promotion				
5.2 Promotion				
5.3 Monitoring				
5.4 Education and training				
Sub-total				
<b>6. Risks</b>				
6.1 Technical risks				
6.2 Conflict of interest				
6.3 Legal/financial risks				
6.4 Change of use				
Sub-total				
<b>GRAND TOTAL</b>				
<b>OVERALL ASSESSMENT</b>				<b>FINAL SITE SCORE</b>



1. ACHIEVEMENT OF AIMS		EXCELLENT	GOOD	FAIR	POOR
Does the site offer sufficient potential for the achievement of the broad aims of river restoration per se?					
1.1 AIMS					
What is the potential for the achievement of the following:					
River: to restore a severely modified river to a regime that is naturally sustainable and appropriate to its historic environment					
Floodplain: to similarly restore the floodplain of the river ensuring that it is fully integrated with the river					
Wildlife: to restore degraded river and floodplain as a suitable habitat for characteristic wetland plants and animals					
Landscape: to restore the river and its floodplain such that its character is enhanced and blends naturally with the surrounding landscape					
Recreation/amenity: to enhance appropriate opportunities for public enjoyment of the restored river and its floodplain either through improved use of these areas or through its enhanced appearance in the landscape.					
Heritage: to conserve or restore any aspect of practice, use or facility forming part of the heritage of the river valley that contributes to the maintenance of environmental quality					
Other ( )					
COMMENTS:		Maximum Score [ ]			

2. TECHNICAL		EXCELLENT	GOOD	FAIR	POOR
Does the site readily offer scope for the physical reversibility of degradation to restore a wide range of environmentally beneficial features?					
<b>2.1 INSTREAM</b>					
Restoration of features appropriate to the natural regime:					
Meandering of straightened channels					
Narrowing of over-widened channels					
Re-profiling of bed; pools, riffles etc.					
Reinstatement of lost substrate; gravels etc.					
Reinstatement of off-river features (e.g. backwaters, bays)					
Other ( )					
Removal of undesirable impoundments, structures, revetments etc.					
Addition of features appropriate to an artificial regime					
Impounding weir/sluices					
Flow diversion sluices					
Lakes, ponds, leates					
Reed beds/silt traps					
Marginal shallows					
Other ( )					
COMMENTS:		Maximum Score [ ]			
<b>2.2 RIVER BANKS</b>					
Introduction of:					
Naturally varied profiles, cliffs, ledges, berms etc.					
Naturally varied alignments					
Water edge trees (e.g. alder, willows)					
Zonal vegetation; damp/dry					
Safe access to water's edge for animals (e.g. otters; people)					
Naturally sustainable revetment techniques					
Other ( )					
Removal of undesirable revetments					
Eradication of invasive plants, e.g. Japanese knotweed					
COMMENTS:		Maximum Score [ ]			

2.3 RIPARIAN CORRIDOR					
Width available on left bank: 5 x bedwidth; min. 7m					
Width available on right bank: 5 x bedwidth; min. 7m					
Removal of inappropriate high spots, e.g. spoil					
Lowering landlevels; reduction of bank heights					
Introduction of:					
Trees, bushes, herbage					
Other ( )					
Repositioning/reprofiling of flood banks					
Removal of floodbanks					
COMMENTS:	<div>Maximum Score [ ]</div>				
2.4 FLOODPLAIN					
Width available in full					
Available both banks					
More than half available on average					
Restoration of:					
Seasonal flooding from arterial river					
Naturally high water tables, spring lines etc.					
Flood plain drainage channels, tributary streams					
Ponds, marsh, flashes, wet woodland etc.					
Botanically rich herbage					
Landscape features; trees, copses, boundaries etc.					
Artificial control of water table; flood regime etc.					
COMMENTS:	<div>Maximum Score [ ]</div>				

2.5 USE OF RIVER AND FLOODPLAIN					
Abstractions:	Potential for improvement of base flow norms				
	Potential for flow splitting				
Discharges:	Potential for improvement of water quality norms				
	Site free of toxic leachates				
Feasible to ensure protection of existing standards of:	Flood defence; urban				
	Fisheries; navigation				
	Public access				
Site free of development proposals; all types					
Potential for changes in management practice:	Cessation of arable on flood plain				
	Cessation of fertiliser on flood plain				
	Reduced channel works; desilting etc.				
	Other ( )				
	Other ( )				
Potential for new/better uses:	Flood plain meadows				
	Productive coppices, pollards etc.				
	Additional public paths				
	Ecological study areas;				
	Amenity zones; beaches, picnicking				
	Buffer strips/zones; tertiary reed beds				
	Other ( )				
	Other ( )				
Potential for restoration of historic uses:	Water meadows; mills; carp ponds				
	Fords, stepping stones, bridges, causeways				
	Archaeological sites; settlements				
	Other ( )				
	Other ( )				
COMMENTS:		Maximum Score			
		[ ]			



3. FINANCIAL		EXCELLENT	GOOD	FAIR	POOR
Can restoration be implemented cost-effectively in both short and long term; will it attract reliable funding partnerships?					
<b>3.1 VALUE FOR MONEY</b>					
Absence of need for high-cost operations, e.g. remove concrete; spoil off-site; diversion of services etc.					
Preliminary budget for works sufficient to achieve a high level of restoration?					
Urban; circa 1km @ £140k					
Rural; min 2km @ circa £215k					
Significant improvements likely to be achieved in respect of:					
Ecological/biological richness					
Diverse flora/fauna/habitats					
Water quality/quantity					
Flood defence/land drainage					
Fisheries					
Landscape					
Recreation/amenity					
Public access					
Other ( )					
Post-works operation and maintenance can be sustained cost-effectively					
Maintenance requirements are low					
COMMENTS:		Maximum Score [ ]			
<b>3.2 FUNDING PARTNERSHIPS</b>					
Grants, partnerships or subsidies, etc. can reasonably be anticipated in respect of:					
River management, e.g. NRA					
Land management, e.g. CC, MAFF					
Recreation and amenity, e.g. Local authority					
Wildlife management, e.g. EN, SNH, CCW					
Other ( )					
Land owner/occupier likely to make a significant tangible contribution to project?					
Land owner/occupier likely to integrate post-works operation and maintenance into business aims, e.g. Farm Plan; Environmental Plan					
COMMENTS:		Maximum Score [ ]			

<b>4. OWNERSHIP</b>		<b>EXCELLENT</b>	<b>GOOD</b>	<b>FAIR</b>	<b>POOR</b>
Are owners and occupiers fully committed to the aims of restoration; are they able and willing to play a full part; would the project have public support?					
<b>4.1 LAND OWNER INTEREST</b>					
Owner interests are not unduly complex, e.g. single owner both banks; freehold?					
Owner interests are well established, e.g. business aims, proven environmental record?					
Ownership is secure in long term; no reason to anticipate change; lack of continuity?					
Owners willing to accept client/promoter role?					
Owners willing to accept legal agreements/covenants?					
Express interest in active participation?					
Willingness to manage occupier interest?					
COMMENTS:		Maximum Score [ ]			
<b>4.2 LAND OCCUPIER INTEREST</b>					
Occupiers likely to be influenced by owners?					
Occupiers subject to control by owner, e.g. land use/tenancy agreement?					
Occupier interest not unduly complex?					
Able to support and accommodate restoration aims, e.g. compatible farm plans?					
COMMENTS:		Maximum Score [ ]			
<b>4.3 OTHER OWNER/OCCUPIER INTEREST</b>					
Specialist owner/occupier interest expected to support project?:					
Angling club					
Conservation Trust etc					
Other ( )					
Other ( )					
COMMENTS:		Maximum Score [ ]			

<b>4.4 PUBLIC INTEREST</b>					
The local community are expected to directly benefit from the project?					
Public able/willing to make an active contribution to the project; e.g. working parties; 'policing'					
COMMENTS:		Maximum Score			
		[   ]			

Version 2.2.

<b>5. PLANNING AND PROMOTION</b>		<b>EXCELLENT</b>	<b>GOOD</b>	<b>FAIR</b>	<b>POOR</b>
Will the site-specific project adequately support the advancement of restoration elsewhere via fulfilment of planning, promotional, monitoring, educational and training objectives etc?					
<b>5.1 PLANNING</b>					
Relevant to:					
Catchment management plans					
River use strategies: water quality and resources, flood defence					
Recreation and amenity strategies					
Countryside strategy: wildlife; landscape					
Sustainable use; forestry etc.					
Other ( )					
COMMENTS:		Maximum Score [ ]			
<b>5.2 PROMOTION</b>					
Geographic location convenient for demonstration purposes?					
Regionally (NRA)?					
Nationally (UK)?					
Internationally (EU)?					
Access facilities good; proximity to road, rail etc.					
Outputs widely relevant:					
Applicability elsewhere					
Extension within the catchment					
COMMENTS:		Maximum Score [ ]			





6. RISKS		EXCELLENT	GOOD	FAIR	POOR
Are risks associated with aspects of the site-specific project intrinsically small; controllable by RRP or LIFE partners?					
6.1 TECHNICAL RISKS					
Low probability of:					
Frequent pollution incidents destroying flora, fauna					
Sustained drought flows; excessive nutrients, algal blooms					
Channel instability; increased/decreased erosion					
'Off-site' problems upstream and downstream					
Contaminated land; disturbance					
Invasive plant species					
Flooding; increase/decrease in high sensitivity areas					
Other ( )					
COMMENTS:		Maximum Score [ ]			
6.2 CONFLICT OF INTEREST					
Low probability in respect of:					
Wildlife conservation v public access					
Angling v other river/corridor uses					
Agriculture v other river/floodplain uses					
Changes in owner/occupier needs/commitments					
Community issues; appreciation; litter; vandalism					
Other ( )					
COMMENTS:		Maximum Score [ ]			

6.3 LEGAL/FINANCIAL RISKS					
Wide margins for error in:	Design/modelling outputs				
	Financial estimates				
	Contract specifications				
	Other ( )				
Low risk of:	Legal actions: negligence; public liability etc.				
	Compensation claims; loss of land; farm outputs etc.				
	Other ( )				
COMMENTS:		Maximum Score			
		[ ]			
6.4 CHANGE OF USE					
Low probability of:	Infrastructure disturbance; new roads, utilities				
	New development; residential, industrial				
	Mineral working; gravels, coal				
	Waste disposal; industrial, domestic, sewage				
	Other ( )				
COMMENTS:		Maximum Score			
		[ ]			

Maximum Score
[ ]

## **APPENDIX 5 NOTES OF MEETINGS**

- A. METHODOLOGY: 31.1.94**
- B. SITE SELECTION: 14.2.94**

A.

RIVER RESTORATION PROJECT MEETING  
Held @ NRA Reading 31.1.94

Present: See Attached List

Purpose of meeting: To consider a draft methodology for the selection of two sites for river restoration under the RRP LIFE demonstration project.

1. General Introduction

A business case for the NRA's involvement is to be produced by NRA (Thames Region) mid-March.

English Nature's requirement from RRP - to improve the landscape value and ecology of rivers.

Countryside Commission are also keen to support the RRP initiative but have yet to decide exactly how they become involved financially. General funding from CoCo e.g. for experimenting with specific techniques, would not preclude Countryside Stewardship payments on an RRP site.

2. Proposed Methodology

Shortage of time prevents us from collecting new factual information about the short-listed sites - thus the selection process will be based on pre-existing data plus subjective judgement. The latter will be made initially by RRP (namely RV and JB), who will whittle the 16 short-listed sites down to a shorter list of 6 sites to be considered by the group present at this meeting.

RV outlined the tick box and scoring methodology - see notes with agenda and score sheets.

AB stressed the importance of key issues being considered alongside the score that results from the evaluation system. The comments box is therefore extremely important and should be enlarged to reflect this.

The aim of the scoring will be to determine a preferred site plus a back-up site for a rural and an urban RRP demonstration site.

3. Refinement of Selection Criteria

Significant amendments were made as shown on the attached Version 2 draft selection criteria document. Other comments to be sent in by individuals following the meeting (as soon as possible).

4. Scoring; Allocation of maximums possible

Limited discussion of weightings. Agreed that the 5 following categories have equal significance (and therefore weighting):-

1. Technical
2. Financial
3. Ownerships
4. Planning/Promotion
5. Risks

Scoring and weightings to be reviewed at the next meeting following scorings of individual sites.

5. Summary

Agreed that NRA Appraisal should be based in the Areas but also individual NRA specialists should gather information. RRP members will also appraise the sites on available information and will make the final analysis/decision. This will culminate in a report, leading to a stance from which funding will be negotiated with potential partners.

At next meeting (14th February) the group should be in a position to decide on the short-list of preferred sites (4-6).

Agreed that the list of 16 sites should be reduced as follows:-

<u>Reject</u>	<u>Include</u>
Medlock	Whittle Brook
Sutton Bk	Alt
Mill Bk	Skerne
Lustrum Beck (Brown Bridge)	Hermitage Stream
Lustrum Beck (Portrack Ind. Area)	Cole
Don	Thame
Hogsmill	
Erewash	
Ock	
Waveney	

Rejection of sites due to various constraints: political, landowner problems, pollution, too short a length, restoration already planned. RV is in a position to draw up the technical rationale for rejecting the 10 sites listed above. All 16 sites will be included in the RRP report.

Dave Keeling (Senior Pollution Officer) to be placed on circulation list in lieu of Paul Barker.

Meeting closed at 13.20.

Circulation

Richard Vivash	RRP	Neil Guthrie	NRA (NW)
Jeremy Biggs	RRP	Andrew Brookes	NRA (T)
Dave Keeling	NRA (T)	Pam Nolan	NRA (NW)
Matthew Carter	NRA (S)	Alastair Driver	NRA (T)
Vaughan Lewis	NRA (T)	David Withrington	E.N.
Penny Marsden	CoCo	Andrew Gale	CoCo
John Steel	NRA (T)	Olivia Mellors	NRA (N & Y)
John Banks	NRA (T) Chair		

**B.**

## **THE RIVER RESTORATION PROJECT**

### **SITE APPRAISAL AND SELECTION**

**MEETING HELD @ NRA, READING ON 14.2.94**

<b>Present:</b>	<b>NRA Thames:</b>	<b>NRA Southern:</b>
	John Banks (Chair)	Mathew Carter
	Andrew Brookes	
	Alastair Driver	<b>English Nature:</b>
	Vaughan Lewis (part)	David Withrington
	<b>NRA Northumbria &amp; Yorks:</b>	<b>RRP:</b>
	Colin Blundel	Jeremy Biggs
	Olivia Mellors	Richard Vivash
	<b>NRA North West:</b>	
	Neil Guthrie	

**Apologies:** Penny Marsden and Andrew Gale - CoCo  
Pam Nolan - NRA, N. West  
John Steel - NRA, Thames  
Dave Keeling - NRA, Thames

#### **1. Purpose of Meeting**

To achieve a consensus on two 'preferred' sites for restoration under the RRP's LIFE Demonstration Project.

#### **2. Outcome**

The following sites were selected for recommendation to RRP's potential LIFE partners:-

- (a) **River Cole:** A 2km river reach located @ Coleshill to the north east of Swindon in National Trust ownership.
- (b) **River Skerne:** a 1.2km semi-urban reach located on the north east side of Darlington in Borough Council ownership.



### 3. Meeting Notes

- 3.1 RV offered apologies received. Penny Marsden (CoCo) had indicated a preference that the urban site selected should be on the fringe of town rather than in a densely built up area.
- 3.2 RV confirmed the following lists of documents that had been circulated prior to the meeting:
- (a) RRP letter and meeting agenda 7th February.
  - (b) Revised Site Appraisal format; version 2.1.
  - (c) Site inspection notes for the following eight sites:-

#### Rural:

R. Cole @ Coleshill  
Ellington Brook near Huntingdon  
R. Thame @ Aylesbury

#### Urban:

R. Alt @ Hyton, Liverpool  
Whittle Brook @ Gt. Sankey, Warrington  
R. Skerne @ Darlington  
Hermitage Stream @ Havant  
Hogsmill River @ Ewell, Kingston Upon Thames.

Recipients had been invited to appraise and score any of the sites with which they were familiar in advance of the meeting.

### 3.3 Site Appraisal Format

This had been revised in line with discussion @ the previous meeting (31 January). A new Section 1 Aims, had been added. The format was accepted as the basis for evaluating alternative sites subject to revised wording, in section 1 prepared by English Nature & CoCo viz revision to the text of wildlife, landscape and recreation/amenity.

- 3.4 It was agreed that the following sites would not be appraised in detail since, although affording good restoration potential, they were unlikely to offer the RRP sufficient opportunity to achieve its stated aims and objective for demonstration sites.

#### Urban:

Medlock, Manchester	Too short/narrow
Sutton Brook, St. Helens	Industrial leachate
Mill Brook, St. Helens	Insufficient degradation
Lustrum Beck, Stockton on Tees	Too short/narrow
Lustrum Beck, Mount Pleasant, Stockton	Industrial tipping
R. Don, Baldon, S. Tyneside	Insufficient degradation
Erewash, Toton, Nottingham	Insufficient degradation

#### Rural:

Waveney, Diss, Norfolk	Not typical
Ock, Abingdon, Oxon.	Owner undecided.

3.5 The sites listed in 3.2 above had all been appraised and 'scored' by one or more of those present. Individual scores were collated to form a list for comparison.

3.6 Rural sites were considered as follows:

**Ellington Brook:** Scored by RRP @ 75% indicating a good site but not excellent. This river was discussed and the site rejected since it has also depended upon gravel extraction going ahead in a timetable compatible with the LIFE project.

**R. Thame:** Scored by three parties in the range good/excellent with the major drawback of being located just downstream of Aylesbury S.T.W. with attendant risks of immediate damage in the event of any serious pollution incident.

**R. Cole:** Scored by three parties all in the range of excellent. The retained river levels above the mill were seen as a constraint by some but as an advantage by others.

It was concluded that the R. Cole represented an excellent site and should be adopted by the RRP. The Ellington Brook afforded novel opportunities for restoration not present on the Cole and should therefore be kept in the picture as a useful supplementary site depending upon developments.

3.7 Urban sites were considered as follows:

**The Hogsmill River** was scored by two parties as 'excellent' but it was agreed that as it was in the same NRA region as the R. Cole it did not offer the RRP a sufficient national spread of interest and was rejected.

**The Hermitage Stream** was scored by two parties as 'good' but all agreed that the concrete lining represented a limiting factor on the extent of restoration that was economically and perhaps technically viable. It was also considered that adjacent flood plain land available was perhaps more suited to urbanised parkland features rather than the 'natural' riparian features sought by RRP. The site was rejected.

**The Whittle Brook** was partially scored by the RRP who found it falling short against criteria that measure the scope for achieving the aims of river restoration. NG also scored the site but agreed it was less suitable than the nearby R. Alt. The site was rejected.

**The R. Alt** was scored by three parties in the range of good/excellent. The small size of the river in the upper part of the catchment was consistently seen as a drawback as was the need to keep water levels @ un-naturally low elevations to avoid surcharging upstream culverts. There were, however, many strengths and it was agreed to consider these in comparison with the Skerne.

**The R. Skerne** was scored by three parties as 'excellent', the main drawbacks being that the reach appeared to be retained behind a town centre weir and the fact that it was perhaps too similar to the R. Cole to provide an adequate rural/urban contrast between sites.

- 3.8 Following general discussion of the merits and limitations of both the R. Alt. and the R. Skerne, the chairman invited all present to sum up their views and express an individual preference. The preferences for the Skerne were consistent if marginal in some cases.

It was concluded that: neither the Alt nor the Skerne offered the RRP all of the features it sought but both were capable of demonstrating visible restoration well. It was not considered necessary to search for further urban site alternatives. The Skerne was considered to be an excellent site for adoption by the RRP which appeared to meet the preference of CoCo for an urban fringe location.

- 3.9 The outcome of Site Appraisal and selection is summarised in Table 1 (rural) and Table 2 (urban) attached.

#### 4. Next Steps

- 4.1 A meeting has been arranged (16 March) between RRP and senior representatives of NRA, CoCo and EN when the outcome of this meeting will be reported. Outline appraisal of the two sites selected will be recommended for partnership funding subject to confirmation that Darlington Borough Council support the Skerne as a potential RRP demonstration site.
- 4.2 The whole of the site appraisal and selection methodology adopted will be written up and presented to English Nature in accordance with their brief to the RRP. Reports will be circulated to participants early in March.

Richard Vivash  
General Manager  
RRP  
February 1994

#### FOOTNOTE:

Since the meeting it has become evident that restoration of the Skerne could be extended d/s of the site to afford a 2km reach that also incorporates features appropriate to densely developed areas.