



River Restoration Centre



De-culverting strategy for the North of England

Selection and Assessment of Potential Projects

Aims and Objectives

- To develop a method for identifying and prioritising culverts for removal
- To develop a tool to evaluate important criteria and then ranks



Project Approach

Develop methodology

Collate Data

Consult Environment Agency, Local Authorities and Water Companies

Initial Data filter to remove bridge and building culverts

Develop Matrix (in consultation with Environment Agency staff

Rank matrix

Desk top assessment of top 300 culverts

Consult Environment Agency Area staff on knowledge of individual culverts

Site Visits to assess potential, constraints etc



Criteria for assessment

- Connectivity** - how much channel is being connected by removing the culvert?
- Length of culvert** - longer culverts are more of a barrier to fish movement
- River size (shreve)** - larger river potentially have more habitat diversity
- Culvert status** - better to remove a failing culvert
- Flooding/blockage risks** - removal and replacement with an appropriate sized channel may reduce flood risk
- Future maintenance** - any future additional maintenance as a result of culvert removal needs to be considered
- Upstream catchment length** - connectivity to headwater spawning grounds would be advantageous
- Current bio-chemical status (WFD)** - opening culverts in watercourses of poor quality gives a greater opportunity to improve water quality
- Number of culverts upstream and downstream** - the greater the number of barriers there are upstream and downstream the less fish passage improvement there will be
- Recommended to be de-culverted** - those culverts recommended for removal by the Environment Agency or Local Authorities have been given higher status

Benefits of de-culverting

The benefits fall into three main categories:

Environmental

- Improve fish passage
- Increase habitat
- Improve morphology
- Improve biodiversity
- Improve water quality
- Reduce habitat fragmentation

Maintenance/Operational

- Reduce maintenance costs
- Easier to trace pollutants in open channels
- Reduce flood risk from blockages or collapse
- Decrease health and safety risks
- Decrease operational risk of flood events

Socio-economic

- Improve aesthetic appearance
- Improve amenity
- Improve social environment
- Potential economic benefits for householders
- Potential increased revenue for local businesses
- Engagement of local residents and stakeholders
- Opportunities for partnership working

Outputs

Filtered dataset with bridge and building culverts removed

Matrix with ranked culverts and the option to add further information as and when it becomes available and re-rank the data

Site visit in depth assessments and 2500 geo-referenced photographs

A methodology for prioritising culvert removal that could be more widely applied e.g.to weirs

Issues to be

Detailed River Network

- Misconnection of parts of the river network
- River networks connected across catchments
- Incorrect labelling of culverts which were in fact sewage outfalls, swallow holes, paths, open channels or mine adits

Amount of processing

- over 41,000 culverts (>50m in length) on the DRN network

Incomplete or inaccurate information in the asset databases

- Course of culvert unknown or incorrect

Required data not recorded as standard

- No heights on weirs



The multi criteria analysis Matrix

Yorkshire and North East Region														
Culvert Informing Outputs		Weighting factors												
Scroll across for assessment map		1.5	0.5	2.0	4.0	3.0	1.0	3.0	-1.0	2.0	1.0	1.0	1.0	2.0
		Recommendation	Length	Connectivity	Up/Down	Status	Flooding	Standard	Maintenance	Stream Order	WFD Status	Obstructions	Spawning	
RRC ratio		TOTAL SCORE	RANK											
SEDRN2752		149.01	1	0	5	14	36	9	0	30	0	20	5.01	10
SEDRN1832		128.18	4	0	1.5	10	36	12	0	12	0	20	6.68	10
SEDRN881		115.34	7	0	1	2	20	9	0	30	0	20	3.34	10
SEDRN1140		104.93	23	0	1.25	4	20	9	0	24	0	10	6.68	10
NUDRN274		104.51	25	0	1.5	3	12	9	0	24	0	20	5.01	10
SEDRN5462		103.68	26	0	5	6	24	6	0	18	0	8	6.68	10
SKDRN378		99.01	38	0	2	4	20	6	0	12	0	20	5.01	10
SEDRN2693		97.68	39	0	5	4	24	12	0	24	0	0	6.68	2
SEDRN5463		97.68	39	0	5	6	24	6	0	12	0	8	6.68	10
SEDRN1141		92.93	49	0	1.25	4	20	9	0	12	0	10	6.68	10
SEDRN6828		66.18	200	0	1.5	0	0	6	0	12	0	10	6.68	10
NUDRN243		65.85	223	0	1.5	0	0	6	0	12	0	8	8.25	10
SEDRN2694		65.68	226	0	5	0	0	6	0	18	0	6	6.68	10
SEDRN5140		61.68	572	0	4	0	0	9	0	12	-10	10	6.68	10
SEDRN5141		61.68	572	0	4	0	0	9	0	12	-10	10	6.68	10
SEDRN3914		89.68	56	0	3	3	16	9	0	24	0	6	6.68	2
NZDRN1590		88.01	60	0	5	4	16	6	0	12	-10	20	5.01	10
SEDRN3915		82.68	66	0	3	3	16	6	0	12	0	6	6.68	10



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