

# **DEFRA High Level Targets** **for Inland Local Authorities**

*Iqbal Rassool – Haswell Consulting Engineers*  
*Bill Burton – Independent Drainage Consultant*

## **Introduction**

Driven by the catastrophic impact of the Midlands-wide Easter 1998 flooding event, the Government introduced in April 2000 the 'Flood and Coastal Defence High Level Targets'. The High Level Targets provide a framework for drainage operating authorities, such as the Environment Agency, Internal Drainage Boards, Local Authorities etc, for the delivery of the Government's policy and objectives for flood and coastal defence.

*To reduce the risk to people and the developed and natural environment from flooding and coastal erosion by encouraging the provision of technically, environmentally and economically sound and sustainable defence measures<sup>1</sup>*

The Targets are predominantly directed at the Environment Agency (EA), to develop a structured flood defence maintenance/renewal programme to optimise the allocation of public funds. However, Internal Drainage Boards (IDBs) and Local Authorities (LAs) are required to demonstrate their willingness to adopt some of the relevant targets as part of their role as operating drainage authorities for 'Ordinary Watercourses' (non-Main-River).

This paper describes the importance of the Targets to the LAs in terms of their responsibilities and the usefulness of the data obtained in plugging the missing information links on Critical Watercourses in the drainage chain for undertaking complex composite catchment analyses.

## **High Level Targets for Inland LAs**

The full list of Flood and Coastal Defence High Level Targets is as follows

- Target 1 - Policy statements
- Target 2 - Provision of flood warnings
- Target 3 - Emergency exercises and emergency plans
- Target 4 - National Flood and Coastal Defence Database
- Target 5 - Flood defence inspections and assessment of flood risk
- Target 6 - Coast protection inspections and assessment of coastal erosion risk
- Target 7 - Expenditure programmes
- Target 8 - Shoreline Management Plans (SMPs)
- Target 9 - Biodiversity
- Target 10 - Water Level Management Plans (WLMPs)
- Target 11 - Coastal Habitat Management Plans (CHaMPs)
- Target 12 - Development in areas at risk of flooding
- Target 13 - Development in areas at risk of coastal erosion
- Target 14 - IDB Administration and Membership

Given their reduced extent of responsibility compared with the EA, the inland LAs are focusing on the following short list of Targets:

*Target 1 - Policy statements (The specific LAs policy for delivery of the Government's flood defence objectives)*

*Target 2 - Provision of flood warnings*

Target 3 - Emergency exercises and emergency plans (Report to DEFRA on forward programme of emergency exercises)

Target 4 - National Flood and Coastal Defence Database

Target 5 - Flood defence inspections and assessment of flood risk

Target 7 - Expenditure programmes

Target 12 - Development in areas at risk of flooding

Due often to the lack of understanding within the LAs of their flooding problems, the EA are actively assisting the LAs with the delivery of these Targets. This is particularly the case for Target Nos 4 and 5 where the EA are endeavouring to promote a standard format for flood defence surveys (in line with their own for Main-rivers) to standardise the type of data being gathered. LAs are applying the requirements of the relevant Targets to their Ordinary Watercourses (non-Main-Rivers) which have been identified as 'Critical Ordinary Watercourses' (COW).

DEFRA Definition<sup>1</sup>:

*'Critical Ordinary Watercourses' are watercourses that are not classified as 'main-river' but which the Environment Agency and other operating authorities agree are critical because they have the potential to put at risk from flooding large numbers of people and property*

## Target 4 - National Flood and Coastal Defence Database (NFCDD)

This Target requires all operating drainage authorities to integrate their COW asset information into the NFCDD. This will be a new GIS MapInfo database currently being piloted by the EA, which supersedes their original Oracle based defence register. The new database will provide an information portal on flood information and defence assets in their geographic context and will enable effective analysis and improved decision-making on investment in flood defence<sup>2</sup>.

Obviously the needs of the EA compared with the LAs differs slightly in terms of the type of data they require:

Table 1 - EA v LA Database Needs

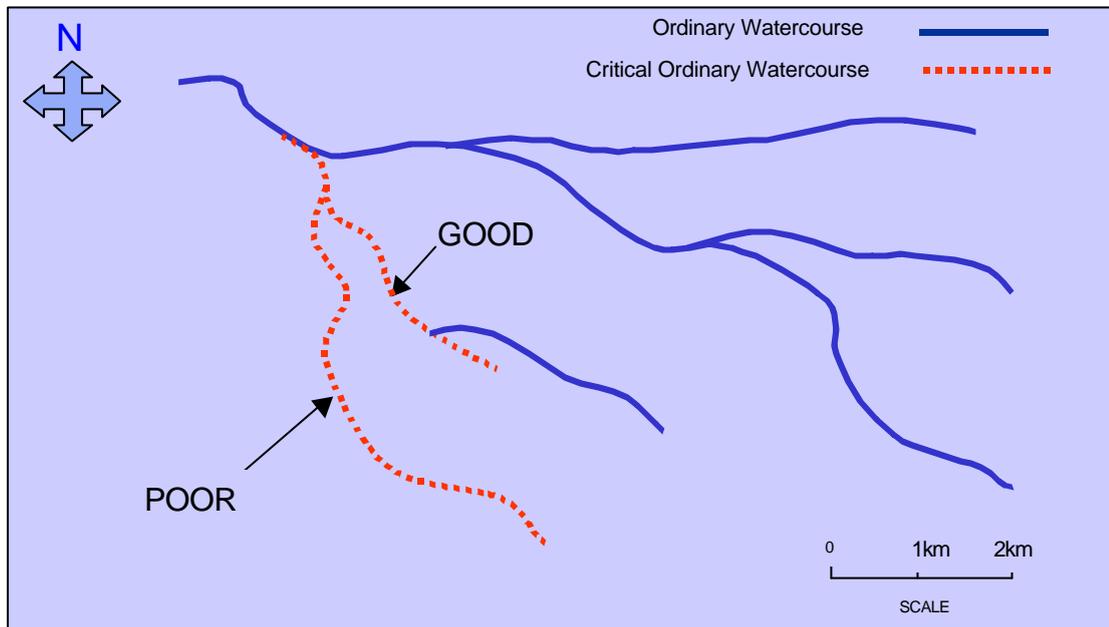
| EA   | LA  |
|--|---|
| Data is related to formal constructed flood defences.  | Often not responsible for formal constructed flood defences.  |
| Database output to enable management of maintenance programme of flood defence assets on Main Rivers | Have general overall responsibility for Ordinary Watercourses and therefore particularly the COWs.  |
| Optimise the allocation of funding to defence improvement and maintenance based on flooding risk.    | Require surveys to be generally flooding focused to deal with known problem areas, with tops of banks and structures often forming the flood defence. |

## Target 5 – Flood Defence Inspections

Following the identification and agreement with the EA of the extent of the COWs in the area, this target underlines the importance of surveying the flood defence assets to determine their structural condition and hydraulic performance. Such a survey should be undertaken in

sufficient detail to provide appropriate information for assessing hydraulic performance, required improvement, and required maintenance. Unfortunately, due to insufficient resources and understanding of the flooding issues, some of the LAs have undertaken extremely sketchy investigations with insufficient data to assess the problem at all.

Figure 1 – The LA Minimum Effort Survey



The quality of the data from such surveys is also important for catchment analyses in plugging the missing links in the drainage chain. For flood investigation work, the industry is striving to create composite sewerage/river models for a more holistic drainage analysis approach. A lack of data on watercourses and particularly the COWs has made this difficult to achieve. The EA have good source data that can be used for their own maintenance planning and for creating outline models on main-river. Similarly, the Water Companies have asset registers of the sewerage systems. However, COWs linking these assets together often have a hydraulically unknown performance.

## CASE STUDY – Stroud District Council COW Asset Survey

This scheme is currently being undertaken by Haswell Consulting Engineers (HCE), and comprises:

- Visual inspection of all of the council's Critical Ordinary Watercourses;
- Inspection and measure of all structures and defences (banks are classed as defences)
- Condition grading of all structures and defences
- Preparation of asset database
- Transfer of asset information and photographs to MapInfo database
- Produce a risk based inspection and maintenance programme
- Produce outline hydro-analysis to identify throttling features
- Produce outline improvement programme

HCE worked closely with the EA to develop a survey specification based on EA standard Main River Asset Surveys. The format of the survey was adapted to create a more flood-focused survey such as obtaining channel and structure dimensions, which is more relevant to the council's needs. Survey data collection forms were developed to obtain all the agreed data from site. In addition HCE worked with the EA to create a format of asset database consistent with their proposed NFCDD, to assist with an upload to the present and future systems.

### Identification of Asset Locations

For surveyors to identify the location of the asset being surveyed on site HCE adopted the EA standard watercourse coding system. This coding system is a function of the National River Number, the Reach Number (changes sequentially upstream between prominent structures), the Sub-reach Number (changes sequentially upstream between minor structures), and the asset number (changes sequentially upstream between changes in defence characteristics). Further to this asset locations are identified by left-bank or right-bank annotation while looking downstream, or in the case of a structure spanning the watercourse this identified as a 'both-bank' structure within a certain asset length.

Figure 2 – Asset Coding 1 of 2 (Code = 1001/01/03)

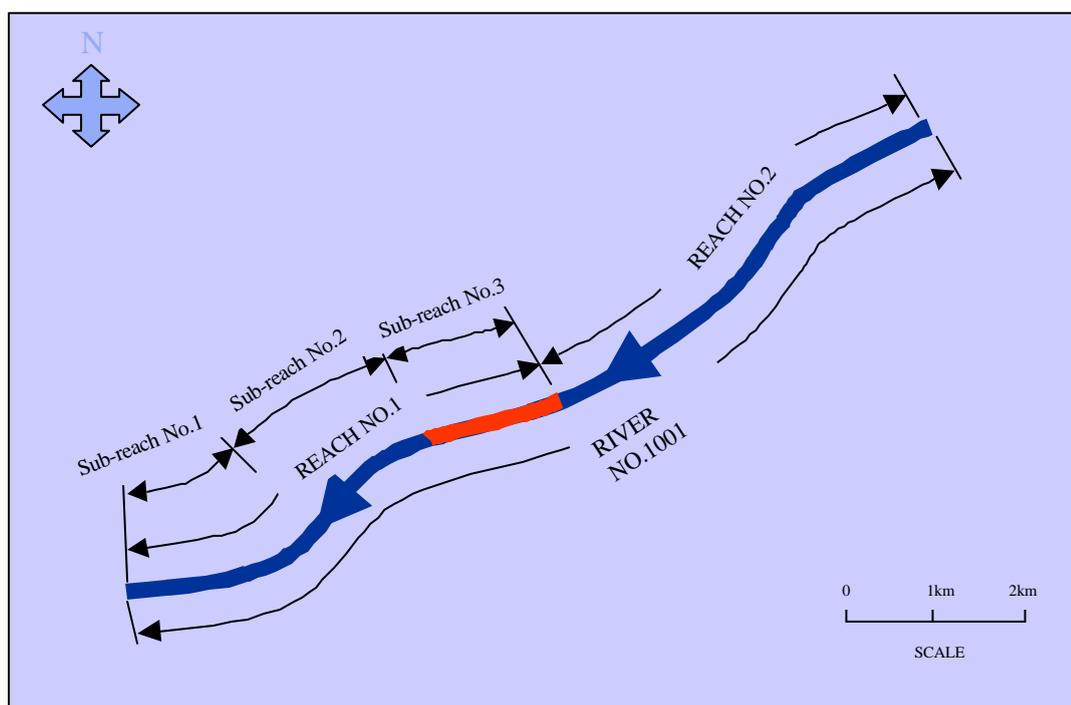
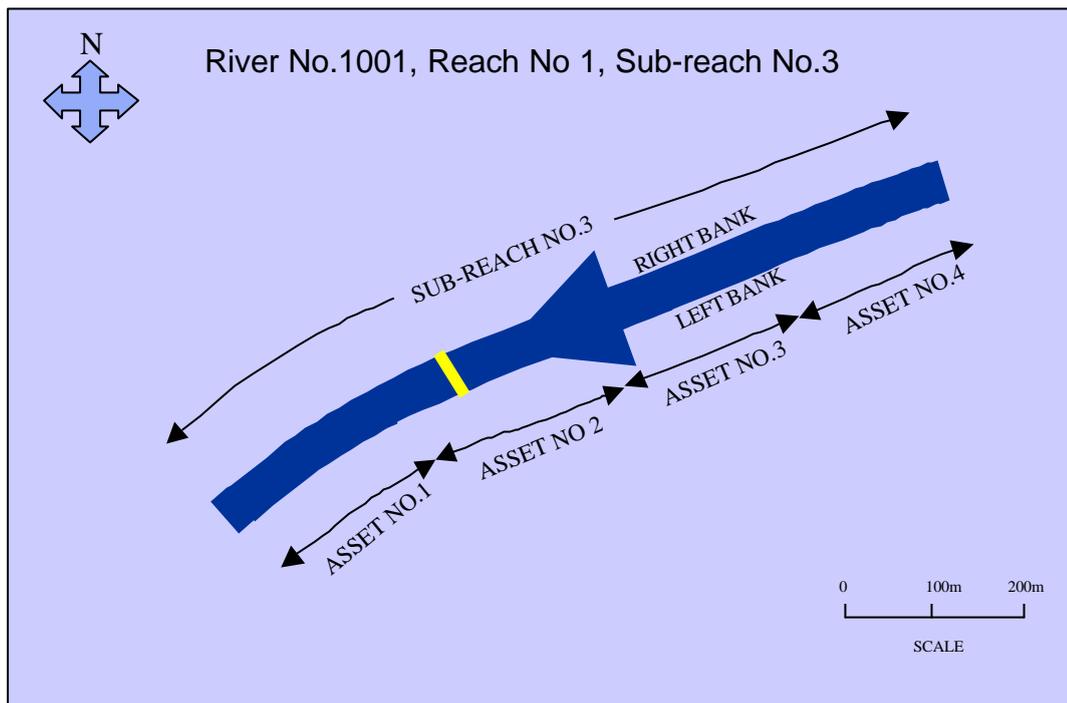


Figure 2 – Asset Coding 2 of 2 (Code = 1001/01/03/02/B)



## Watercourse Performance Analysis

Using the data from the visual inspections and asset condition grading, in accordance with the standard EA grading system, a brief assessment of the hydraulic performance was undertaken by HCE. This involved the following tasks:

- Flood flows obtained from FSR/FEH
- Simple hydraulic analysis based on surveyed channel and structure dimensions and an approximate bed slope from OS contours or available levels
- Survey used to estimate channel roughness and apply to simple channel flow/culvert capacity calculations
- Identify problem assets (hydraulically) and suggest solution options
- Prepare outline programme of improvement.

## Conclusion

It is clear that Local Authorities feel that they have a responsibility to the tax payers and the flood victims to at least know the condition and performance standard of the COWs in their area. Many of the Local Authorities do not have the funding to put in place major works, but they should have a maintenance and improvement strategy for COWs in place. A procedure for COW surveys has been developed between HCE and the EA at an affordable level, by tailoring the EA Main River survey specification to suit the specific needs of the LA. COW surveys provide information on the throttling structures and defective watercourse reaches to enable the LA to develop emergency plans with greater focus. The surveys also provide information to enable the LA to work with riparian owners to improve the flood situation. A consistent format for such surveys will provide suitable information to enable the inclusion of COWs in complex surface-water composite catchment analyses, thus plugging what has always been regarded as a major knowledge gap in the link to main-river.

## References

1. DEFRA Nov 1999 – *High Level Targets for Flood and Coastal Defence*
2. Science Systems Software Press Release Nov 2001 – *National Flood & Coastal Defence Data Project*