**RRC Catchment Restoration Fund monitoring protocol**

**Key:**

* **Target/why –** What is the overall objective of the works which are to be monitored?
* **What –** What are you trying to observe from your monitoring? E.g. increased sinuosity and habitat heterogeneity through re-meandering and adding large wood / reduction in nutrient inputs by installing SuDS.
* **How –** What techniques are being used to collect data and what assessment methods are you using? E.g. electro-fishing monitoring diversity, abundance, density, length and age.
* **When –** When are you collecting data (month/season)? Duration/length of monitoring period, how many sampling repeats, how regularly?
* **Who –** Who is the individual and/or organisation responsible for monitoring? Will this be done by more than one organisation?
* **Data –** Do you have access to any pre-project data? E.g. monitoring data from the Environment Agency.
* **Cost –** Cost of monitoring. Are all costs in kind, or are there expenditures for e.g. external lab analysis.
* **Which WFD objective is this helping to achieve –** Which WFD quality element will be addressed by your works? If not WFD, does the work/undertaking aim to improve favourable conditions (for designated sites or species, e.g. SSSI/SAC/SPA/BAP) or does it relate to any other policy drivers (e.g. public engagement, socio-economics, flood management, ecosystem services)
* **Priority and confidence:**Priority: High/Medium/Low importance that your monitoring method can show potential improvement of the related WFD quality element; the favourable condition (i.e. designated site or species such as SSSI, SAC, SPA, BAP); and/or other policy drivers (e.g. socio-economics, flood management, ecosystem services).
Confidence: High/Medium/Low confidence that the monitoring is robust, suitable and has the potential to show what you are trying to observe within the CRF project time limit.

| **Target/Why**What is the overall objective of the works which are to be monitored? | **What**What are you trying to observe from your monitoring? | **How**What methods are you going to use? | **When**What periods over the year and how often? (to indicate variability)And where if possible | **Who**Who is going to do this? | **Data**What existing data is available in addition to the monitoring being outlined here | **Cost**(can be in kind) | **Which WFD quality element is this helping to achieve?****If not WFD specify (e.g. SSSI, SAC, BAP or other policy driver)** | **Priority**High/medium/low linked to WFD or other designation  | **On target**Are the monitoring tasks outlined running to schedule?(if no specify)NOTE- can use RRC update questionnaires as a start. | **Key reporting tool and reporting output** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Confidence** High/medium/low robustness of monitoring |
| **Will be different for each project – what is the project aim for the area being photographed?**  | A visual change in (please specify) as a result of (please specify) | Fixed point photography – for methodology, refer to RRC’s Practical river monitoring guidance (2011)X number of photos (state if known) & indicate if RRC have been provided with a map of points (Y/N) | E.g. Before, immediately after and post works recommended (state dates if known, e.g. month and year) | Project team/ Volunteers | State if fixed point photography or any anecdotal/ ad-hoc photography prior to CRF | Through project/ In-kind | State which of the following, the FPP demonstrates: a) WFD targets, b) designated river or c) other e.g. social science targets | Priority: Please state (only grey if High) | Yes/ No | A time-series of fixed point photographsState if any other analysis is being done |
| Confidence: Please state (only grey if High) |

* **On target –** Are the monitoring tasks outlined running to schedule? If no, why not?
* **Reporting tool and reporting output –** How will your collected monitoring data be recorded and the analysis outputs reported?

**Example of Fixed Point Photography:**

| **Target/Why**What is the overall objective of the works which are to be monitored? | **What**What are you trying to observe from your monitoring? | **How**What methods are you going to use? | **When**What periods over the year and how often? (to indicate variability)And where if possible | **Who**Who is going to do this? | **Data**What existing data is available in addition to the monitoring being outlined here | **Cost**(can be in kind) | **Which WFD quality element is this helping to achieve?****If not WFD specify (e.g. SSSI, SAC, BAP or other policy driver)** | **Priority**High/medium/low linked to WFD or other designation  | **On target**Are the monitoring tasks outlined running to schedule?(if no specify)NOTE- can use RRC update questionnaires as a start. | **Key reporting tool and reporting output** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Confidence** High/medium/low robustness of monitoring |
| **Visual improvement in the health of the catchment** | Visual evidence of: change in water level, colouration (to indicate sedimentation issues) and reduction in impacts on macrophytes | Ad-hoc fixed point photography | Late winter or spring was generally the time of year when issues occurred so visits will be made over the next few years to assess change. | Environment Agency | Canal & Rivers Trust (CRT) baseline photographyEnvironment Agency - historical record of discolouration/ sedimentation incidents. | In-kind (through project) | Current issues are significant and threaten the aimed achievement of ‘Good’ status in the WFD River Dun waterbody. Would most likely ‘Fail’ if no action was taken. | Priority: High | No - Given periodic nature of the issue, no opportunity to show improvement, as of December 2013. | Fixed point photographic series pre and post works |
| Confidence: Low (FPP only undertaken on ad-hoc basis |
| **Replace existing discharge weirs with 7 new lock bypass weirs to transfer water from lock to lock & retain turbid water along 5km of canal rather than discharge to R. Dun** | Water retention within Kennet & Avon canal system (Lock 64 – 70) to reduce the input of sediment and algae from the canal navigation via overspills into the river Dun (which degrades the river, leading to incidents). | Automated water quality monitoring system (AWQMS) in Kennet & Avon canal system.EA – routine water chemistry sampling at this site.Record incidents of extreme rainfall (when water has to be passed to the Dun). | AWQMS deployed but data collection started in August 2013 after a major period of discharge in June 2013.Hence there is unfortunately a poor baseline dataset for comparison.Recorded data every 15 minutes. | Environment Agency and CRTLocal fisheries on Dun and the Hungerford Town & Manor have their own monitoring systems. | Periodic reports of discharge from canal to Dun on EA incidents database, plus AWQMS data from 2013CRT records of discharge events from the canal. | EA ad hoc monitoring work, plus through project and subsequent operational management | Essential action to delivering:WFD River Dun – Good ES status, due to poor ‘Fish’ habitat (expert judgement) – currently ModerateWFD River Kennet (Dun is tributary of) - Good ES status, due to poor ‘Fish’ habitat – currently Moderate | Priority: High | Yes | Post-project appraisal document to be drafted in 2014/ 2015 (include graph of base flow, number of incidents and sediment data (parameters include DO, turbidity, diatoms, chlorophyll), alongside photography, with aim to illustrate improvement/s. |
| Confidence: High |
| **Improvement in river habitat for fish, water voles, otters, other small mammals, invertebrates and sensitive chalk stream species.** | Reduction in smothering of gravel beds and on performance of macrophytes/ aquatic vegetation; Improvement in invertebrate and fish populations; Increase in river bed heterogeneity  | WFD standard invertebrate kick-sampling and fisheries monitoring (EA)Visual walkover of assessment of macrophytes, gravel beds and habitat suitability assessment for aquatic mammals (CRT) | WFD invertebrate baseline -monitoring at 4 sites over two seasons in 2013. Plan to repeat it once by 2015.WFD Fisheries surveys under - one site done this year, two more planned by 2015Walkover assessment of habitat in 2013. Plan to repeat it 2015. | Environment AgencyCRT | Baseline invertebrate data collected for the project in 2013 plus historic invertebrate and occasional fish survey data, mainly at lower end of the impacted reachThe River Dun has a paucity of biological data | In-kind (through project, and continuation of EA routine monitoring points) | Essential action to: WFD River Dun – Moderate status, due to poor ‘Fish’ habitat (expert judgement). Aim is to meet ‘Good’ ESWFD River Kennet (River Dun is a tributary of) – Moderate status, due to poor ‘Fish’ habitat. Along with other actions in Kennet, aim is to meet ‘Good’ ESKennet SSSI & Freemans Marsh SSSI. Improve the status of protected area to favourable. | Priority: High | Yes | EA - Output will be WFD compatible, e.g. Fisheries Classification Scheme (FCS2) dataCRT – Biotope mapping and macrophyte (planform view), overlaying data from consecutive years & pre/post |
| Confidence: Medium (infrequent post surveys infrequent; biotope mapping may not fully convey the ‘change’ CRT is hoping for). |
| **Improvement in aesthetic value for canal & river visitors and partnership working with local communities and businesses** | Reduction in number of complaints from visitors about river water quality | Refer to photography if supportive (CRT);Public events (on waterscape.com);Media coverage (press calls at 2 sites);Feedback from anglers & landowners on the River Dun | Ad-hoc (dependent on press calls & public events). Mostly qualitative and anecdotal. | CRT/ Environment Agency when on site | Formal incident log held by Environment Agency Information/ data from Hungerford Fishery. | In-kind (through project) | WFD – N/ASecondary aim of the project | Priority: Low (secondary objective) | Yes  | CRT press release, project blog and video on Environment Agency website (filmed in November 2013). |
| Confidence: High |