**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 |
| **Provide a spawning and nursery glide/riffle just downstream of Shopham Bridge (SZ 9855 1840) on the Rother** | - Change in fishery habitat quality (proxy is velocity, water depth and cross-section survey data, assessing topographic change);- Naturalness of flow characteristics (ADCP data) | KRFisher & Maltby Land Surveys (pre only)- Longitudinal and cross-section surveys of Rother, Sutton End Stream & Burton Mill End Stream sections- Topographic survey specifically for the riffle site- Hydraulic model data with predicted impact on flow (using ISIS software)Jenny Cox- Cross-sections (only) with an Acoustic Doppler Current Profiler (ADCP) to calculate velocity & water depth every 1-3m throughout the reach. | KRFisher & Maltby Land Surveys baseline survey (2012)Jenny Cox - baseline, as-built, one month & 3 months after works. 60 - 90 cross-sections for each survey | Pre only – KRFisher Consultancy Ltd & Maltby Land SurveysPre, as-built and post – Jenny Cox (Portsmouth University PhD student) | Flood risk assessment (data from Fittleworth gauging station) | KRFisher Consultancy & Maltby Land Surveys (through project)Jenny Cox (in-kind) | Western Rother WFD Ecological Status is ‘Poor’ (‘Fish’) & ‘Quantity and dynamics of flow’ (Overall Hydro Morphological Quality) – target ‘Good’ | Priority: High | Yes | Interpolation of cross-section points to be undertaken in mid-2014 |
| Confidence: High |
| **Improvement in the natural river habitat diversity and recovery of the 3 streams after restoration** | Visual change in river corridor following restoration works change | Fixed point photography;Count of the number of trees and lower scrubby bank-side bushes; and Monitor siltation (place measuring sticks in the ground at each point to assess level change) | Before and after on all 3 streams with a focus on the River Rother. Minimum of 4 sites. After project works completed, once a year for three years (until to/ beyond CRF). | Ses Wright (Arun and Rothers River Trust) | None | Through the project | Western Rother WFD Ecological Status is ‘Poor’ (‘Fish’) & ‘Quantity and dynamics of flow’ (Overall Hydro Morphological Quality) – target ‘Good’ | Priority: High | Yes | Photographic series of points; Tree/ woody material count;Measure of siltation |
| Confidence: High |
| **Increase in the fishery value of restored sections and tributaries** | Change in abundance and diversity of fish in the Rother, Sutton End & Burton Mill End Streams | Electrofishing for the main riffle site and fish refuge site (sub-contractor)Electrofishing at sites on both tributaries (Environment Agency) | Pre works baseline survey (2012); post works fish surveys will be undertaken in July 2014. Minimum of 4 sites. | Sub-contractor and Environment Agency | Angling records; Anecdotal evidence; Fisheries data from the nearby Shopham loop site | Through the project | Western Rother WFD Ecological Status is ‘Poor’ (‘Fish’) – target ‘Good’ | Priority: High | Yes | Electrofishing Catch-depletion estimates; Number of fish and species recorded  |
| Confidence: Low (only 1 pre and 1 post) |
| **Increase in suitable spawning sites following restoration** | Increase in the success of created gravel spawning sites created through the CRF project | Redd counts when river flow and weather conditions suitable. 3 count locations. Skilled and experienced individuals will conduct the counts. | Post redd counts - winter 2013/14. Minimum 1 count to be compiled each year for atleast 3 years after works completion. | Local angler/ARRT/EA support required | No local redd data for the area as no suitable gravel spawning sites in the main Rother channel or tributaries. | Through the project | Western Rother WFD Ecological Status is ‘Poor’ (‘Fish’) – target ‘Good’ | Priority: High | Yes | Redd count (i.e. the number of fish ‘nests’/ egg masses laid) |
| Confidence: Medium (3 years post) |
| **Increase in the biotic health of the restored sections (using aquatic invertebrates as a proxy)** | Change in invertebrate abundance and diversity (in the main Rother only) | Kick-sampling standard EA methodology on the main riffle site and fish refuge site (sub-contractor) | Baseline survey (2012); and post CRF works fish surveys will be undertaken around July'14. Minimum 4 sites (Rother only). | Sub-contractor and Environment Agency | Environment Data from nearby sites | Through the project | Invertebrates already at ‘Good’ status, but links to ‘Fish’ as a proxy for biotic health of the water body. | Priority: Medium (invertebrates at ‘good’ status) | Yes | BMWP score |
| Confidence: Low (only 1 pre and 1 post) |
| **Increase in the biotic health of the restored sections (using Molluscs as a proxy)** | Change in the abundance and diversity of Mollusc | Identification of Molluscs, will cover all 4 of the CRF improved river reaches | Baseline survey (2012); Post works survey in Summer 2014. | Local Mollusc expert | Historic surveys may have been undertaken by the volunteer | In-kind (local volunteer) | Not related to WFD failures; only objective of the project | Priority: Low (project objective only) | Yes | Assessment of taxa/ species recorded |
| Confidence: Low (only 1 pre and 1 post) |