**“How to use” guide for the River Restoration Centre’s 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.
* **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?

| **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) | **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) & if points indicated on map (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: High (All CRF projects were encouraged to prioritise FPP) | Yes/ No | A time-series of fixed point photographs  State if included in e.g. final report |
| Confidence: Please state (only grey if both confidence and priority are High) |

**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) | **Key reporting tool and reporting output** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Confidence**  High/medium/low robustness of monitoring |
| Improved morphology on a significant part of the SAC/SSSI.  23/25 | Improvement of the form and function typical of a Norfolk chalk river (e.g. channel narrowing, restoring gravel bed, increasing sinuosity, increase in woody debris) | Fixed-point photography  (substitute for morphological monitoring) | Every quarter and when work is undertaken | Pensthorpe Conservation Trust | Historical and pre-works pictures; have aerial pictures in addition as well. | In total: £23k | Morphology: moderate; target: good  Improvement of favourable condition (SAC/SSSI) | Priority: High | Yes | Comparing timeline of photographs. Final report (either in-house or by Atkins) |
| Confidence: High |
| Improve water quality of urban run-off from Fakenham and adjacent agricultural land. 25 | Reduction in  nutrient inputs through installation of SUDS - creation of reed beds on the floodplain to assist with control of run-off | Visual checks of drainage and signs of pollution. | Weekly monitoring of sites for pollution by visual checks. | Pensthorpe Conservation Trust | Environment Agency records | Phosphate: good (also monitored to achieve SAC target)  DO: high  Diatoms: bad | Priority: Medium (subjective) | Yes – Atkins accessing SUDS viability. Discussing the situation with the Environment Agency project team at the next on site meeting | Water quality checks and fish survey by Environment Agency, standard data forms/sheets and reports provided.  Comparison between pre and post works surveys.  Monitoring data collected on forms, spread sheets and protocols (digital).  Planning final report of monitoring results. To be produced either in-house or by Atkins. |
| Confidence: Medium (subjective) |
| Water quality monitoring (will discuss what is monitored, e.g. phosphates, DO). Also substituting diatom monitoring. | EA monitoring periods to be confirmed | Environment Agency | Priority: Medium  (already good/high), but High as substitute for diatoms) |
| Confidence: High (but Medium as substitute for diatoms) |
| Improve fisheries, invertebrates and plant communities within the SSSI and SAC. 23/25 | River restoration  and provision of  improved  backwater habitat will significantly  improve fisheries  habitat and  enhance fish  populations. | Invertebrates –standard EA protocol, 3min kick (+1min hand sampling) - identification of taxa, abundance, community characteristics, BMWP, ASPT, family LIFE score and PSI | Summer 2013 and summer 2015 (monitoring might continue with RiverFly, to be discussed) | Pensthorpe Conservation Trust (Mark Ryland) | Pre works surveys and for fish surveys historical records by Environment Agency | Invertebrates: moderate  Macrophytes: no data  Fish: moderate; target: improve (but maybe still moderate)  SSSI/SAC target: lasting improvement in ecological condition | Priority: High | Yes |
| Confidence: Medium (needs to be extended to show results) |
| Macrophytes – standard EA protocol, rapid assessment + plot surveys and fixed-point photography. | Summer 2013 and summer 2015 | Pensthorpe Conservation Trust | Priority: Medium (no WFD data) |
| Confidence: High |
| Fish – PDC electro-fishing, catch depletion surveys at each reach + at reedbed. Identifying species, number of individuals, weight and length. | 29/08/13 and summer 2014/15 (to continue with EA routine survey) | EA | Priority: High |
| Confidence: Medium (within project time) |
| River corridor ecological survey | Summer 13/14/15 | Pensthorpe Conservation Trust | Priority: High (for SSSI/SAC target) |
| Confidence: High |
| Restore the connectivity of the floodplain and floodplain wetland habitats, including the restoration and creation of reedbed habitats. 23/25 | Significant, measureable  and lasting improvement  in ecological condition to  significant part of Unit 48 of the River Wensum  SSSI/SAC and floodplain. | Protected species monitoring including water vole, bat, crayfish and otter | Pre-monitoring: water vole, bat, otter, crayfish (summer 2013)  Post-monitoring: repeat in 2014 and 2015 | Pensthorpe Conservation Trust | Ecological surveys by Wild Frontier, pre works surveys by Pensthorpe Conservation Trust. | Increase in BAP species  Improvement of favourable condition for SSSI/SAC  Morphology: moderate, target: good | Priority: High (for BAP species) | Yes |
| Confidence: Medium (within project time) |
| Protocols will also be established to monitor colonisation of the new floodplain habitats, notably reedbed, for a range of indicator species. | Summer 2014, 2015 (to continue in following summers). Weekly monitoring of reed bed species and colonisation. | Pensthorpe Conservation Trust | Priority: High (for SAC target) |
| Confidence: High |
| Fixed-point photography (substitute for monitoring increased favourable condition for SSSI/SAC) | On-going - every season + before, during and after any works. About 30 points (but will increase this year). Points are GPS recorded and mapped. | Pensthorpe Conservation Trust | Priority: High (for SSSI/SAC target) |
| Confidence: High |