Upper Wharfe Sub-Catchment Evidence Pack for the Water Framework Directive

Executive summary of suggested EA priorities:

- *Need Characterisation Study of Hebden Beck; this advanced study will identify the loading from five mines and four adits, and investigate the contribution from spoil runoff.*
- *Further work is required to evaluate potential solutions to address the identified sediment issues from Grimwith Reservoir. This measure has been added to Yorkshire Water's NEP as an adaptive management scheme.*
- *Flows from Grimwith reservoir are erratic and fluctuate widely. If biological data shows that there is an impact from flows an options appraisal will be required to identify the preferred solution to mitigate the flow problem. Any solution is likely to be associated with a modification to the compensation release.*

Headline characteristics of the sub catchment:

Protected Areas – *Malham Tarn and Conistone are within the Craven Limestone Complex, a designated SAC. Grimwith is within designated SAC/SPA North Pennine Moors.*

Additional Information – *The Catchment Based Approach Partnership hosted by the Yorkshire Dales Rivers Trust identified ongoing pressures on the lower parts of Grassington Moor and historic lead mining as major issues in the catchment. The EA are yet to identify the reason for failure of Oughtershaw Beck but the YDRT are tackling bank side erosion in this water body. They are also targeting Littondale and Skirfare erosion problems as there is scope to expand the project.*

Significant Water Management issues (SWMI)*:*

- *Diffuse Pollution – rural*
- *Flow problems*
- *Physical modifications*
- *Natural Conditions*

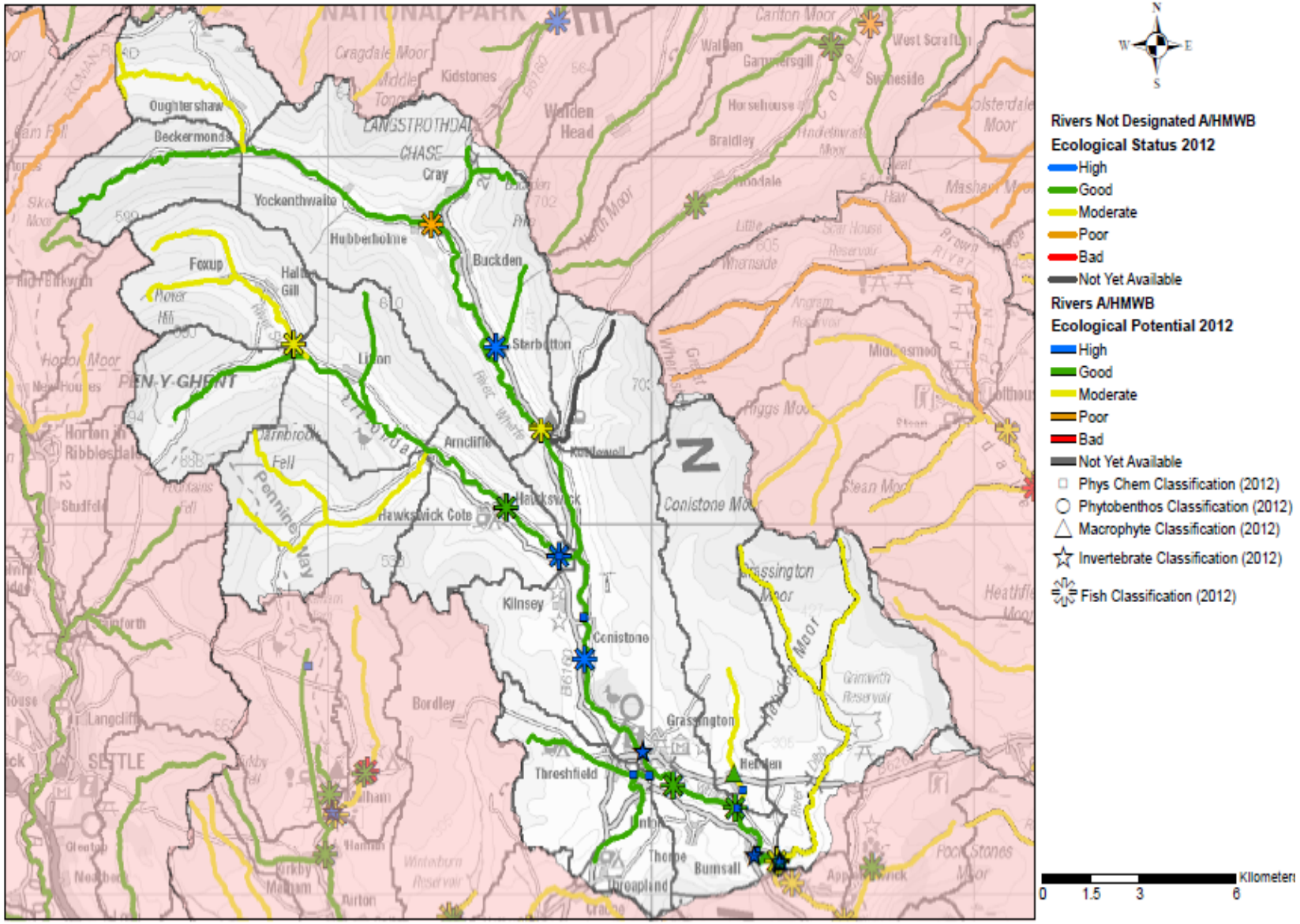
Risk of deterioration:

Groundwater: *The Upper Swale Catchment is within the Wharfe and Lower Millstone Grit and Carboniferous Limestone groundwater body. In the first round of classification there were no groundwater quality or quantity failures in this sub-catchment however additional monitoring has shown that it now fails the groundwater impacts on surface water test. This is due to abandoned metal mining (lead, cadmium, zinc and barium). The failure is caused by impacts within the Hebden Beck (GB104027064190) surface water body. A catchment characterisation study has been undertaken for Hebden Beck and is part of a national project to deal with abandoned metal mines causing pollution for WFD. The purpose of these studies is to identify the magnitude and location of the pollution. Following on from this, the Hebden Beck may be assessed to see whether any suitable treatment works could feasibly be put in place. There are also several other catchments which are at risk for water quality from abandoned metal mines which will require assessment. These are:*

Fir Beck/Blands Beck Catchment (trib of Wharfe) (GB104027064080)
Barben Beck/River Dibb Catchment (trib of Wharfe) (GB104027064120)
Wharfe Barben Beck/River Dibb to River Washburn (GB104027064252)
Wharfe from Park Gill Bk to Barben Beck/River Dibb (GB104027064253)
Park Gill Beck from Source to River Wharfe (GB104027069220)
Wharfe from Oughtershaw Beck to Park Gill Beck (GB104027069290)

Upstream and downstream considerations / influences / impacts: *Peat grip blocking is an ongoing project in the Upper Wharfe. Signal crayfish, a non native invasive species, are prevalent in the River Wharfe from Park Gill Beck to Barden Beck. The Conistone fish site is just below Kilnsey Trout Farm and it is likely that the population of crayfish will be most well established here. We must seek sustainable and cost-effective methods for managing established invasions of species.*

Kettlewell is a village in Upper Wharfedale situated at the foot of Great Whernside and Buckden Pike. The upland catchment is rural and flows through open 'disadvantaged' agricultural land towards the village. The surrounding hillside is scattered with springs and old mine workings. The soil type is peat over limestone bedrock. The water course runs approx 3km along an exposed river bed over sections of limestone pavement with very shallow flows. In dry weather conditions the upper reaches of the River Skirfare disappear underground through sink holes in the limestone bed for four kilometres before emerging further downstream just above Arncliffe village. The lower failing stretch does not dry up, though it can be particularly shallow in areas. Cosh Beck Head and Foxup Beck join together below the small hamlet of Foxup. The area is primarily a mixture of low intensive upland sheep and beef farming. There are three main settlements: Halton Gill is the largest and all properties, including two bunk barns are on private septic tanks or sewage treatment plants. The River Wharfe from Park Gill Beck to Barden Beck starts at the confluence with Park Gill Beck at Kettlewell going down to the River Dibb confluence. A major tributary Hebden Beck which is under investigation for mine water pollution from abandoned lead and zinc mines has its confluence with the River Wharfe in this section.



Baseline situation as of 20/03/14

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The table below highlights some suggested measures that could have big WFD benefits for the sub catchment based solely on data and information collected by the Environment Agency:

Priority	Summary of Issue	Bundles of Tier 3 Measures	Affected waterbodies	Action Needed	Delivery mechanism	Potential partners	Progress	EA Lead Teams
1	Impact of abandoned metal mines on copper levels	Mine water discharge remediation /treatment	GB104027064190	EA Regional Water Quality department has submitting a project bid for a Characterisation Study of Ashfold Beck, this advanced study will identify the loading from five mines and four adits, and investigate the contribution from spoil runoff. A further project bid will be made for a Hebden Beck Characterisation Study.	Project	Coal Authority		Regional WQ
2	Impact of low flows due to impounding structures and their impact on fish movement	Increase in-channel morphological diversity, Enable fish passage (e.g. fish pass),	GB104027064120	A geomorphological survey confirms that there is a sediment issue in this water body. The report provided evidence that the river downstream of the reservoir lacks loose mobile deposits, cobble paving is common and gravel in particular is rare. This is probably due to the interruption of sediment supply from upstream. Further work is required to evaluate potential solutions to address the identified sediment issues. This measure has been added to Yorkshire Water's NEP as an adaptive management scheme.	NEP	YWS		Regional WR and IEP
				Flows from Grimwith reservoir are erratic and fluctuate widely between drought and flood because the reservoir is used to augment flows in the River Wharfe for the Yorkshire Water abstraction at Lobwood. Our evidence shows that flows are not having an impact on Invertebrate status which is high below the reservoir. However we have no fisheries data and so evidence is required to provide certainty that reservoir flows are not impacting fish populations. There is currently an action plan to gather further biological data to support the hydrological findings. This measure has been included on Yorkshire Waters NEP as an 'L2a scheme' i.e. a probable change to a licence before completion of an investigation and options appraisal. If biological data shows that there is an impact from flows an options	NEP	YWS		Regional WR and IEP

				appraisal will be required to identify the preferred solution to mitigate the flow problem. Any solution is likely to be associated with a modification to the compensation release.				
2	Invasive species	Seek sustainable and cost-effective methods for managing established invasions of species.	GB104027064253	Identify and investigate means of control for signal crayfish. At present there is no effective control mechanism for the Signal population which became established in the Wharfe during the 1990s. This measure to be updated as more knowledge becomes available. Tackling INNS has been identified as a priority issue by the CaBA Partnership.	Project	Kilnsey Trout Farm, Yorkshire Water, YDRT.		F&B
3	Lack of habitat and land management issues – (Not a direct reason for failure so not in WAP)	Increase in-channel morphological diversity	GB104027064180 GB104027069250	The Upper Wharfedale Best Practice Project took place in the neighbouring valley in 2002. It was a community partnership that promoted good land management with a view to protecting habitats and water quality while encouraging sustainable hill farming to continue. The Upper Wharfe Catchment Restoration Project (started 2011) led by Yorkshire Dales Rivers Trust, seeks to continue work started above in the Skirfare catchment. Whilst this measure is not identified in the Waterbody Action Plan, the cumulative impact of this project will have WFD benefits locally.	Project	YDRT	Ongoing	EM – Land and Water

CRITERIA / DEFINITION of EA priority:

1 = High ***EA believe these actions are essential to enable the water body / sub catchment to meet GES / GEP based on professional judgement / monitoring evidence.***
2 = Medium ***EA believe these actions will make a difference: improve an element or contribute to achieving GES / GEP.***
3 = Low ***These actions should have a cumulative impact and should make a change within class or locally***

Further evidence required by internal EA Teams to confirm existing WFD status or any potential improvement in status.

Team	Waterbody	Action/activity	Progress
EM Land and Water	GB104027069250	Walkover plus additional sampling during a hot dry summer would confirm the extent of the dried up area and assess the influence of nutrient, temperature and dissolved on the isolated pools.	
	GB104027069220	Review temperature results from new sample point. Park Gill Beck runs approx 3km along an exposed river bed over sections of limestone pavement with very shallow flows which will increase temperature. At the top of the village there is good tree cover at top of village, further down here is little available space to increase tree cover	

Potential Partners

- **Yorkshire Water Services** Work together to understand the impact of Grimwith Reservoir
- **Catchment Sensitive Farming Officer / Yorkshire Farming and Wildlife Partnership** Advice to farmers regarding farming techniques aimed at limiting phosphate losses (e.g. Using phosphorus fertiliser and manures according to the results of soil testing and nutrient balance assessments of inputs and off-takes, preventing soil erosion by growing cover crops in winter, maintaining grass buffer zones/riparian zones on field boundaries or fencing water courses to prevent animal access). Since the inception of CSF in 2006 all holdings in the Wiske catchment have been targeted and this initiative has secured successful engagement with approximately 70% of farmers in this area.
- **Yorkshire Dales Rivers Trust** Experience of land maagement projects
- **Coal Authority** Owners of abandoned metal mines
- **Yorkshire Dales National Park Authority** Their Management Plan sets out ambitions for how the National Park will be looked after over the next five to ten years.
- **Kilnsey Trout Farm** Well established populations of Crayfish at the Farm so we may need their help in managing their movements.

The Evidence Packs are not statutory Environment Agency published documents. The Evidence Packs have been written by the Environment Agency's Water Framework Directive Catchment Coordinator for the Swale, Ure, Nidd, Ouse and Wharfe. The information within the Packs has been derived from Environment Agency monitoring, investigations and catchment walkovers. The aim of the packs is to summarise this data and information for use as an engagement tool and ultimately to help inform the next River Basin Management Plan which will be published in 2015. If you have any feedback on the documents or the information within please contact Claire.Tunningley@environment-agency.gov.uk