

enhancing... improving... cleaning... restoring...
changing... tackling... protecting... reducing...
create a better place... influencing... inspiring...
advising... managing... adapting...

Waterbody Information Pack Avon Waterbody

Draft WIP – January 2011

AEP Officer – Anna Harlow (724 6233)

The purpose of this document is to provide an overview and steer for delivery against environmental objectives in the Avon waterbody

Avon Waterbody Information

The waterbody has a current status of Moderate. The Avon waterbody must achieve overall Good Ecological Status (GES) by 2027 but **fish must improve to Good Ecological Status by 2015**.

The failing elements in this waterbody are fish and pH. Table 1 summarises the waterbody information for the Avon waterbody.

Table 1 – Avon Waterbody: Status and Reasons for Failure

WB Number	WB Name	Regional Priority*			Current Status	Objective				Failures
		P1	P2	P3		2009	2015	2021	2027	
GB108046004940	Avon		✓		Moderate	Good	Good	Good	Fish	
					Moderate	Moderate	Moderate	Good	pH	

*Please see Appendix 7 for further information on Regional Priorities

Appendix 6 shows the location of consented discharges, abstraction licences and other regulated sites in the Avon waterbody. There are 2 large discharges in the Avon waterbody (larger than 50m³/day max or 16m³/day DWF). These are both sewage treatment works (South Brent & Diptford STW). There are 4 abstractions in the waterbody (3 surface water and 1 ground water). There are no authorised landfill sites or active IPPC sites. There are 2 active waste management sites within the waterbody.

High level outcomes we need in this waterbody should be clearly expressed. For the Avon waterbody, we want:

1. An improved evidence base and confidence in the results of classification to drive further improvement in the future
2. To identify the measures needed to address failures and meet Good Ecological Status by 2015, 2021 or 2027.

The first outcome requires the Analysis and Reporting team to review existing data and potentially undertake further investigations to clarify reasons for fish and pH failures in the waterbodies.

The second outcome requires agreement from all parties (including external partnerships) as to what actions are necessary to address failures in the waterbodies. These can be implemented straight away if quick wins, or programmed in if further funding and resource are required.

Additional Information:

Fish:

See below for site information:

Sites 9410 and 9411 are failing for eel and salmon and are almost certainly affected by Avon dam (low flows, possible WQ). Access for eel and salmon is limited by obstructions downstream, notably Lydia gorge. Note site 9411 is also failing for trout, for which access would be less of an issue.

Site 9348 Bala brook is failing for salmon and trout, suggesting access problems (Lydia Gorge) and possible WQ (eg pH).

Site 9189 Avonwick is failing for eel and trout. No obvious causes as far as I know.

Sites 9415 Bickham Brook and 9190 Glaze Brook also failing for eel - possible obstructions?

Site 9414 Horsebrook is failing for trout - may need investigation.

Site 9416 Cocks Brook is failing for bullhead - may need investigation.

Investigations:

SW2009-17477 - PH1a - Unknown - uncertain there is a failure/impact investigate to confirm failure and/or impact

SW2009-17478 – pH - Investigate cause of failure

Lydia Gorge – partial blocker to fish and possibly eel migration.

EO intel:

Upstream of Shipley Bridge, the river is just bedrock and not suitable spawning habitat. There is a stopper on the Bala Brook but fish do get over it at higher flows.

Desk study:

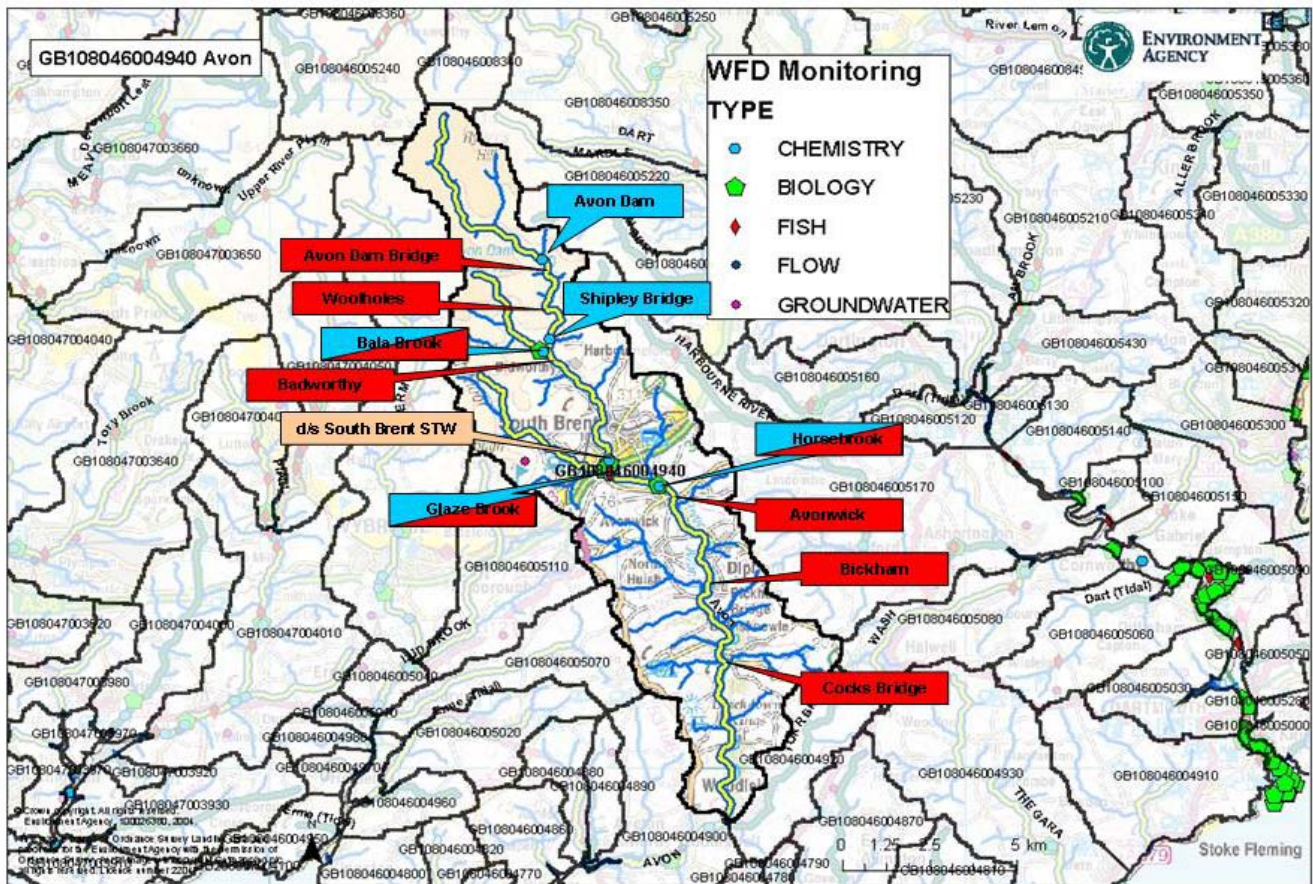


Figure 1. Map of waterbody showing chemistry (blue) and fish (red) sample points used for assessment. Blue/red labels show sites common to both.

WATERBODY ID	WB NAME	CATCHMENT	WB TYPE	HMWB	A&R Lead & support
GB108046004940	Avon	Avon	River	Not designated	A Bailey & R Pearson

Relevant Monitoring Points					
Diatoms	Macrophytes	Fish	Invertebrates	Physico-Chemical	Chemistry
9289 Avon at 140m d/s South Brent STW 9309 Avon at 10m u/s Horsebrook	9309 Avon at 10m u/s Horsebrook	See Table	9289 Avon at 140m d/s South Brent STW 9302 Avon 30m u/s Shipley Bridge 9309 Avon at 10m u/s Horsebrook 9303 Glaze Brook at	70826092 Avon Dam 70826082 Shipley Bridge 70822802 Bala Brook 70826066 d/s South Brent STW 70822203 Glaze Brook	70822802 Bala Brook 70826055 Horsebrook 70826082 Shipley Bridge 70826092 Avon Dam

			Higher Turtley 9304 Bala Brook at 100m u/s Zeal Bridge	70826055 Horsebrook	
--	--	--	--	------------------------	--

Desk Top Investigation

AVON WATERBODY GB108046004940 (Fish Surveys used in Moderate Classification)

Site ID	Survey ID	Site NGR	Watercourse	Site Name	EQR	Class	Descriptor	date
9189	82428	SX7177057520	RIVER AVON	Avonwick Station (Te)	0.324	3	Moderate	2004
9190	111658	SX6981058840	GLAZEBROOK	Avonwick Mill (Te/WFD)	0.555	4	Good	2008
9347	106165	SX6853061800	BADWORTHY BR	Badworthy Bridge (Sp)	0.538	4	Good	2007
9348	106697	SX6779062510	BALA BROOK	D/s Zeal Bridge (Sp)	0.316	3	Moderate	2007
9410	108790	SX6800064980	RIVER AVON	Avon Dam Bridge (Sp)	0.164	2	Poor	2006
9411	104347	SX6801063650	RIVER AVON	Woolholes Bridge (Sp)	0.107	2	Poor	2006
9414	106699	SX7099058750	HORSEBROOK	Horsebrook (Sp)	0.541	4	Good	2007
9415	106703	SX7243055480	BICKHAM BR	Bickham House (Sp)	0.596	4	Good	2007
9416	106708	SX7320053170	COCKS BROOK	Fir Plantation (Sp)	0.208	3	Moderate	2007
Overall EQR average					0.372			

Diatoms: Good Chemistry: Good
 Macrophytes: High Invertebrates: Good.

Fish: Moderate. Reasons for failure: 2 'Poor' classifications at sites Avon Dam Bridge and Woolholes Bridge where only Brown Trout were found. FCS2 model expected salmon and eels to be present but were not found. This is probably due to influence of Avon Dam Reservoir and moorland acidification reducing diversity.

The average EQR for the waterbody given above is 0.372, which is close to the 'Good' threshold which is 0.4.

The failure is therefore marginal.

Physico-Chemical: Moderate. Moderate status results from low pH values. pH data used for assessment was collected from the 6 sites given above (and see map at end). For the two sites 'Avon Dam' and 'Avon at Horsebrook', data was available for the 3 years 2006-2008. For all other sites, data from 2006 only was used. Four of the sites lie on the main River Avon, two are tributaries.

Compliance is assessed using percentiles and the non-compliance resulted from low pH percentiles for the three sites 'Avon at Dam' (2006-2008), Avon at Shipley Bridge' (2006) and 'Bala Brook' (2006).

Low pH values in the waterbody are the result of moorland acidification in the upper catchment (acidification of the headwaters in adjacent river catchments (eg River

Teign) is well known). pH values are lowest at the top of the catchment and increase with distance downstream. The 'failing' sites are the three highest up the catchment. This is demonstrated in Figure 1, which shows mean pH values for the year 2006 with distance downstream from Avon Dam.

Conclusions

Fish: The Moderate classification of the waterbody is caused by the two sites directly downstream of The Avon Dam Reservoir, which are both classified as Poor.

This is due to the regulated flow from the dam and naturally occurring low pH. It would not be cost effective to change these influences.

If these two sites were removed the average EQR for the waterbody would increase to 0.44 which is good status.

This would be a fair reflection of the waterbody as a whole.

Phys-Chem (pH): The confidence in the 'Moderate' classification is high. As mentioned above, low pH values in the upper catchment are a natural feature and will not change. Consequently, we do not expect the 'Moderate' classification to improve.

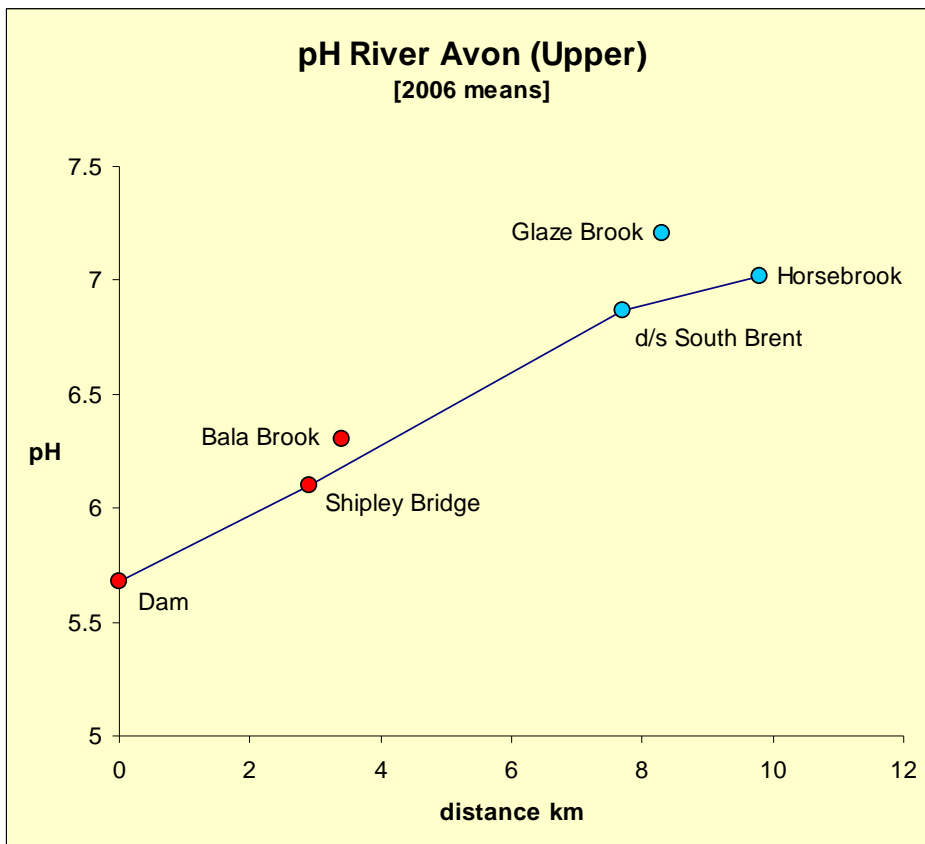


Figure 1. pH increase with distance downstream. Failing sites shown in red. In order to determine whether the pH behaviour shown in Figure 1 is a temporary or persistent feature, mean values for the period 1996-2010 were compared. Figure 2

shows this data for the three failing sites and for the site at Horsebrook. It is clear that the pH profiles for each site are different and that this difference is permanent. The low pH values for the classification year, therefore, are not an aberration.

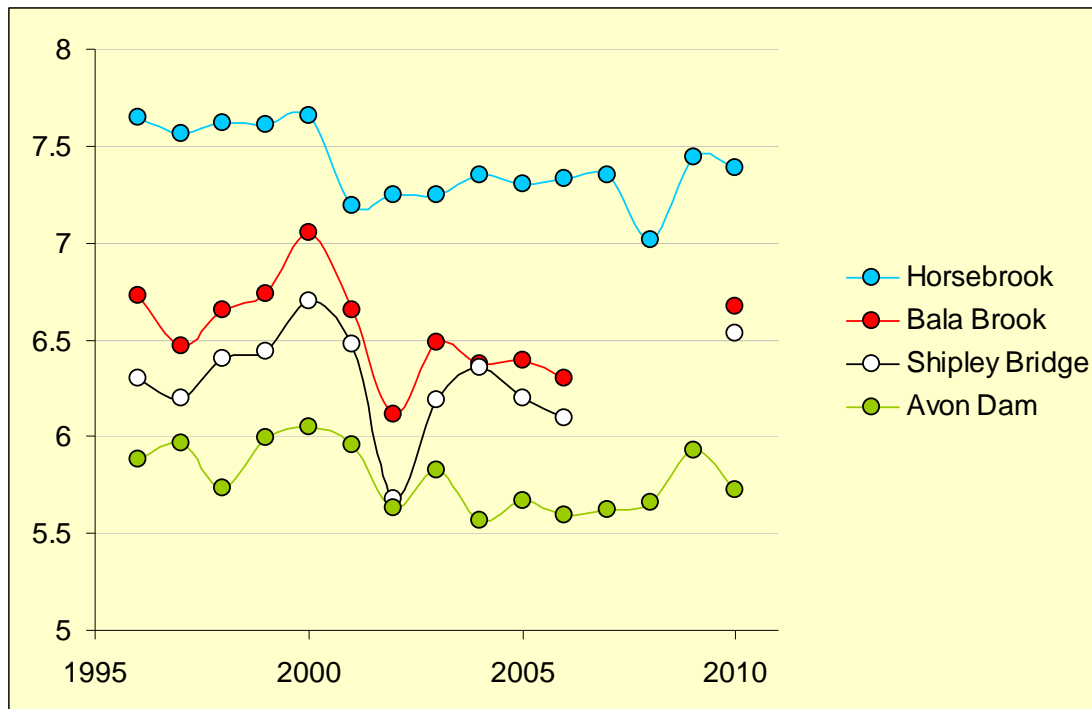
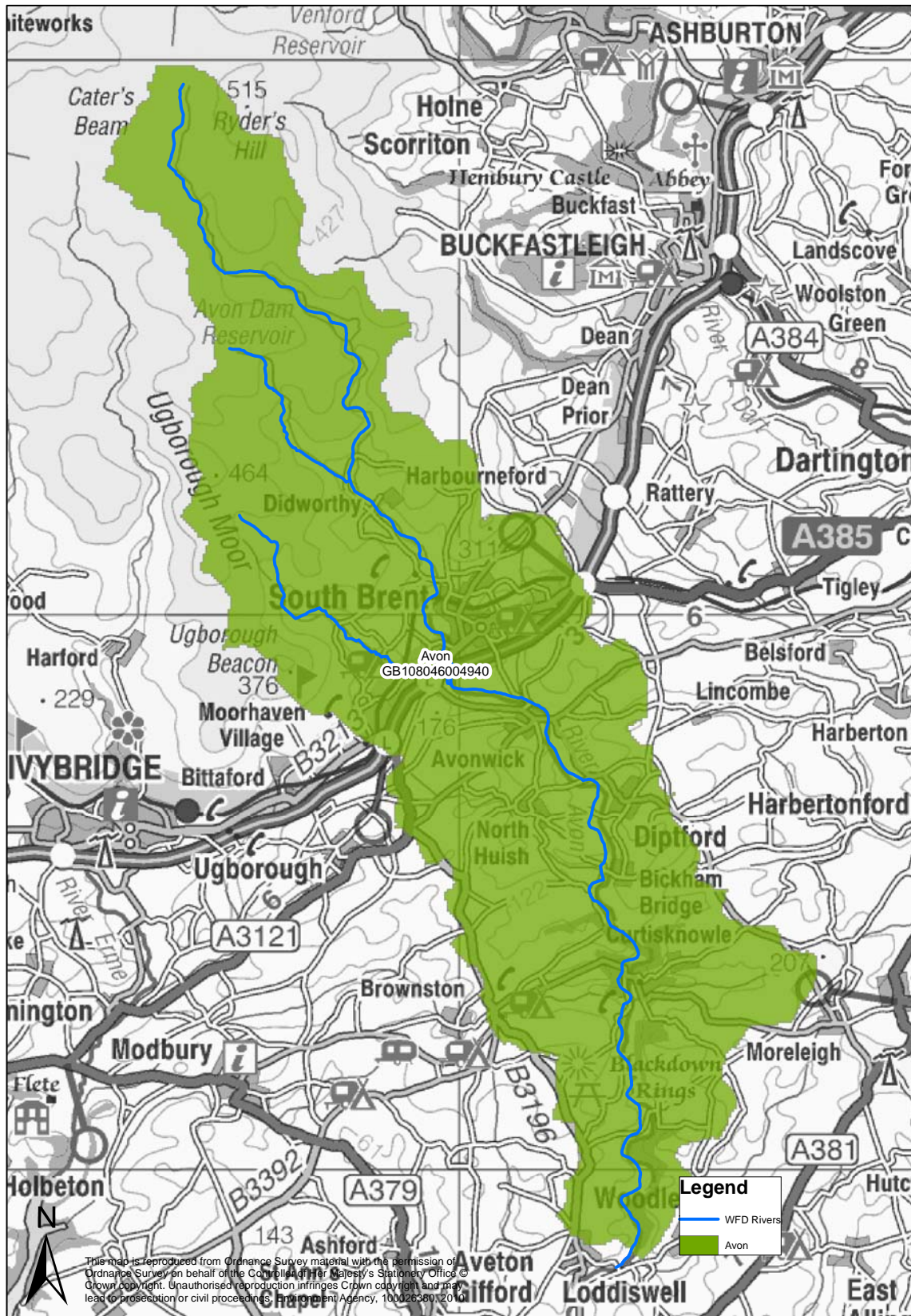


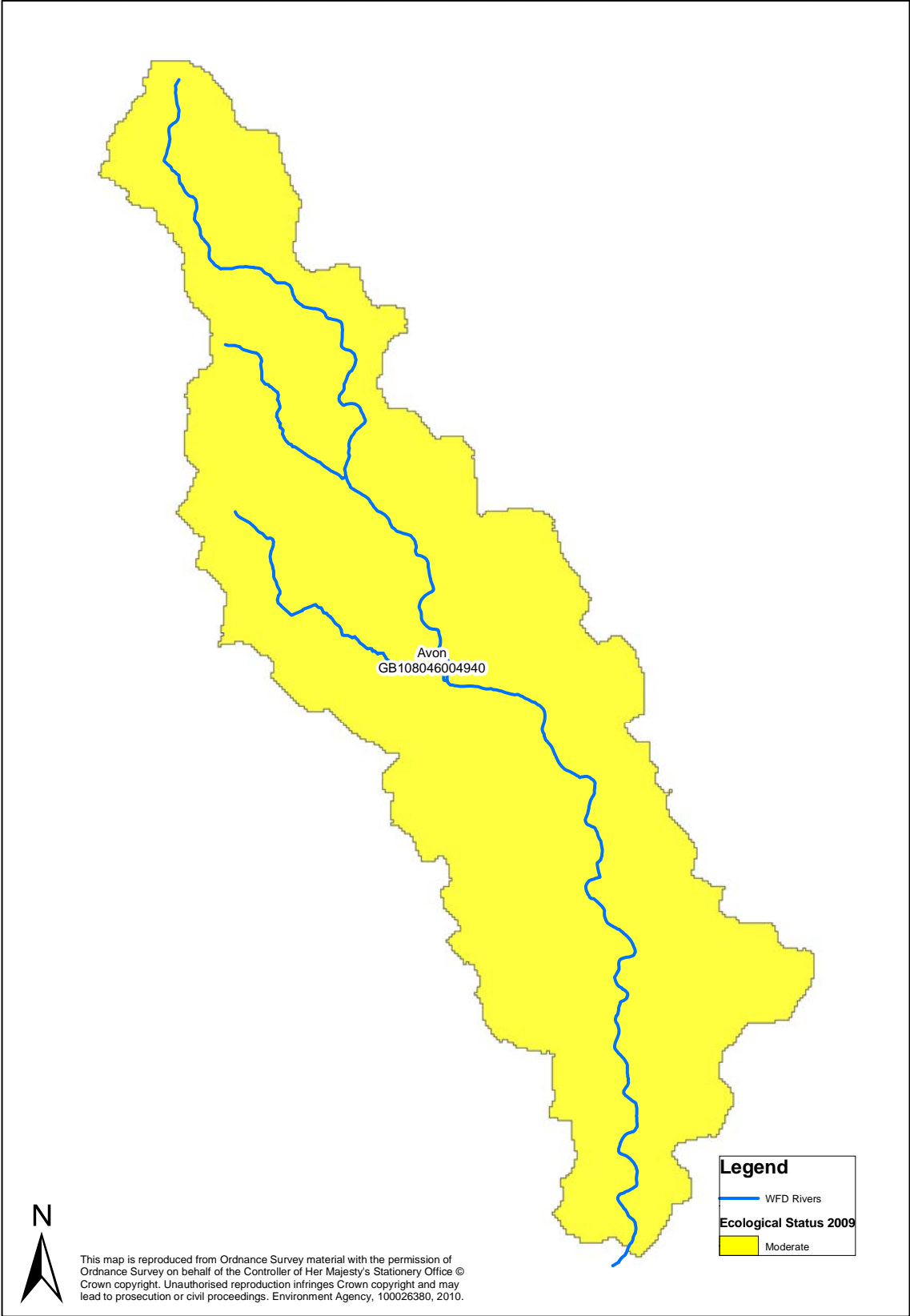
Figure 2. Historic pH profiles (annual means) for the three failing sites and for the downstream site at Horsebrook

Appendix 1 – Avon Waterbody

Avon Waterbody Implementation Plan



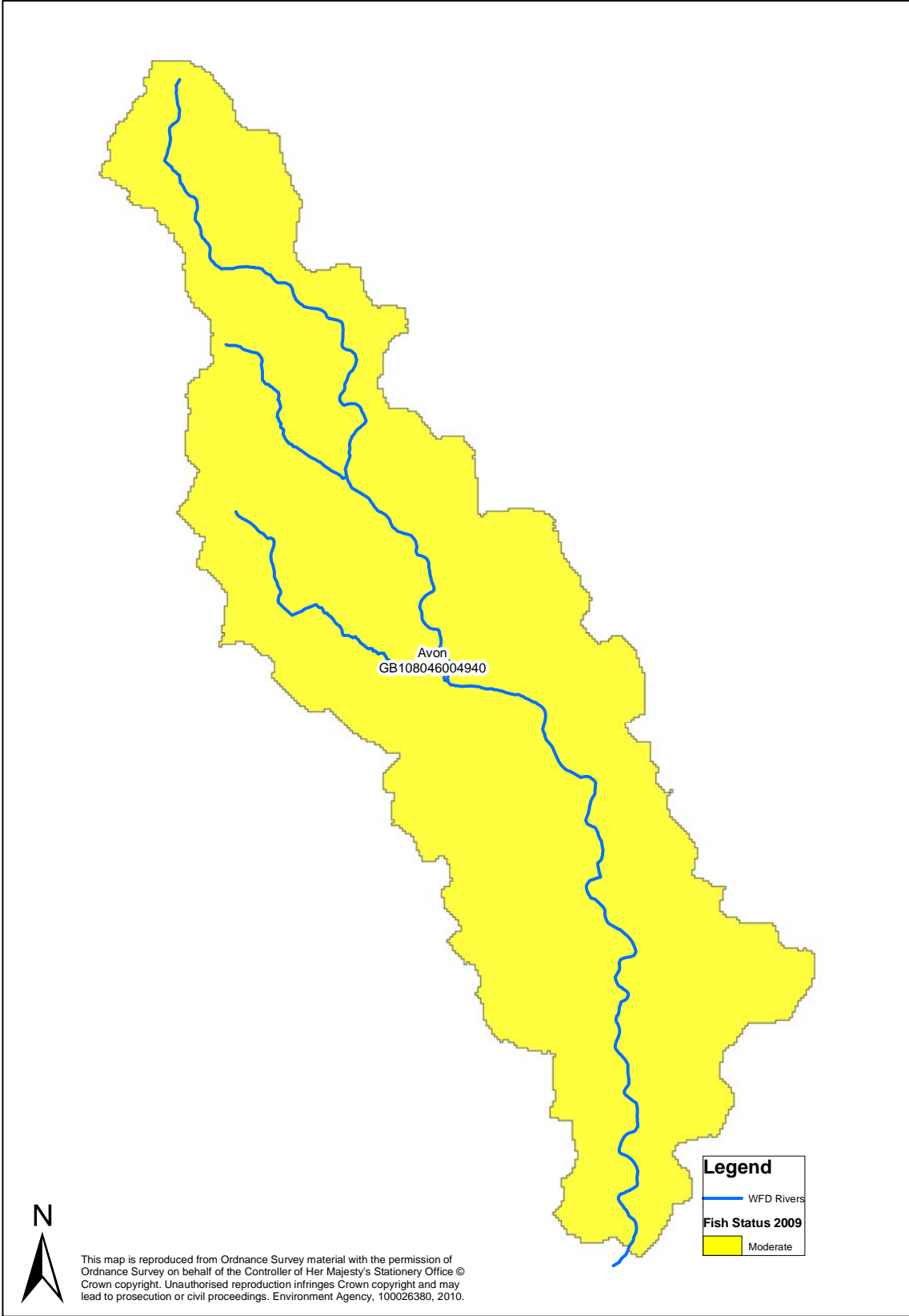
Appendix 2 – Ecological Status 2009



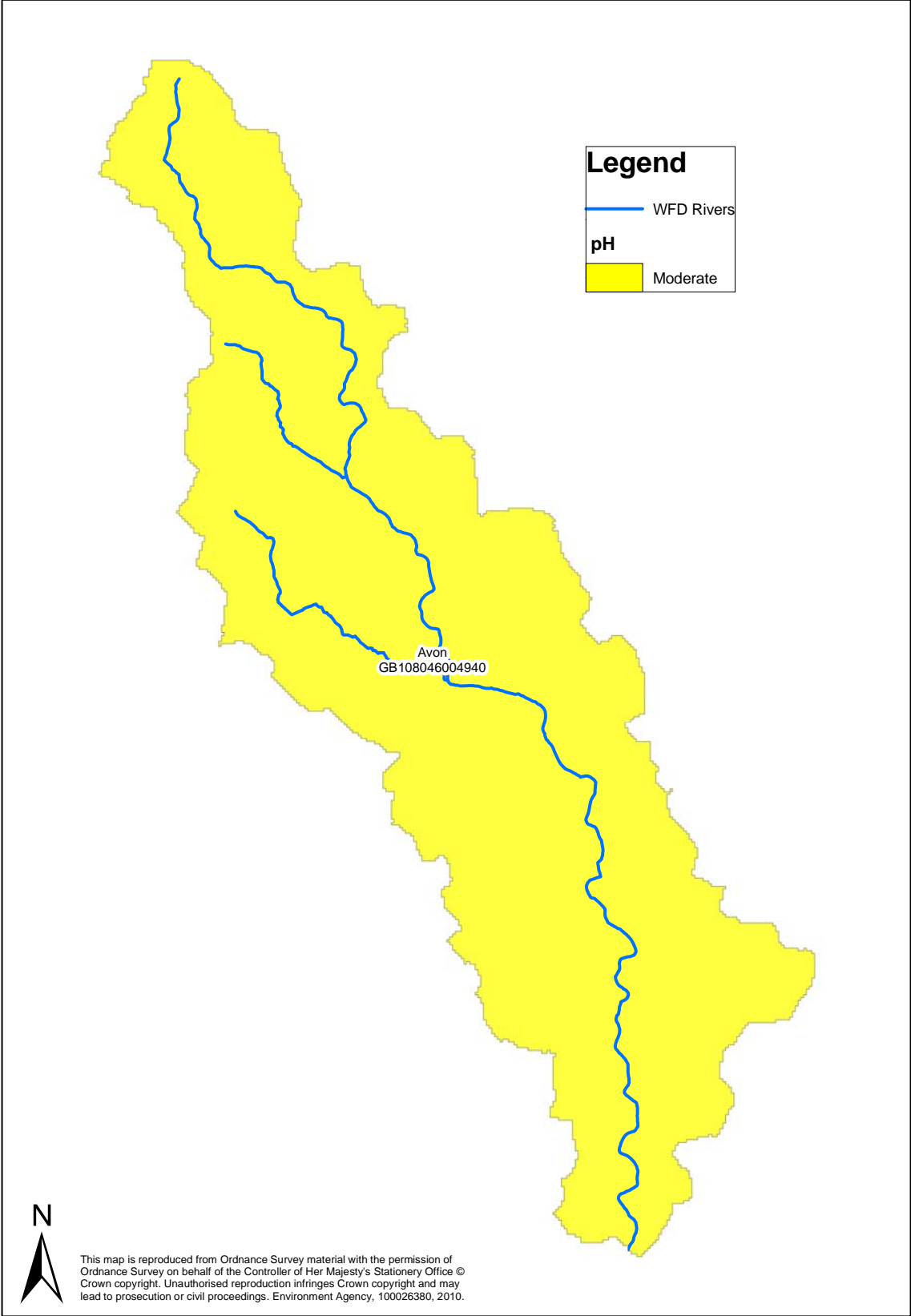
Appendix 3 – Overall Ecological Objective



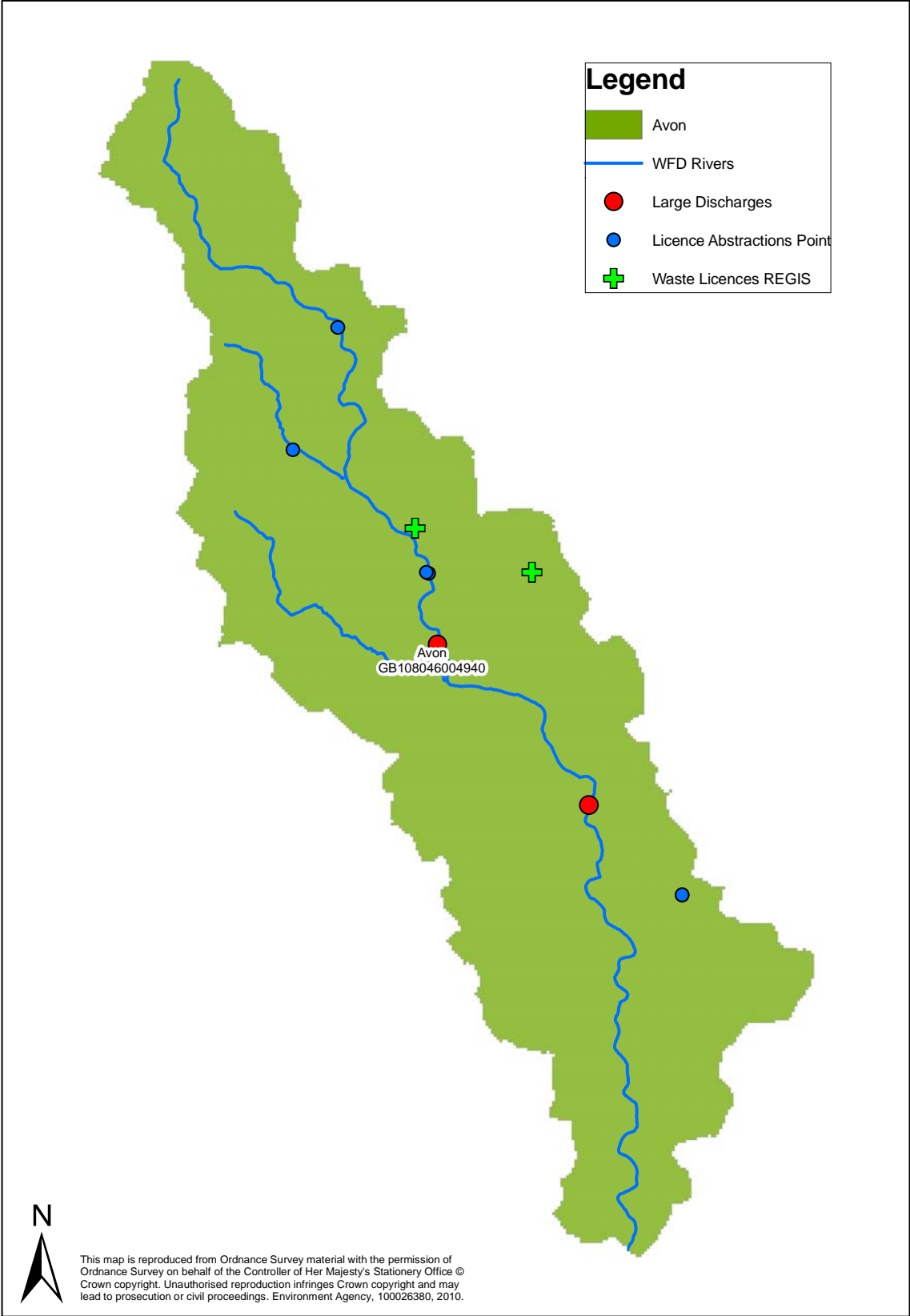
Appendix 4 – Fish Status 2009



Appendix 5 – pH Status 2009



Appendix 6 – Regulated Sites



Appendix 7 – Regional Priorities

Priority 1 (P1) is to deliver improvements in water bodies where we have set an objective of Good Ecological Status by 2015. These are the improvements required to deliver the target of 43% of waters at Good Ecological Status

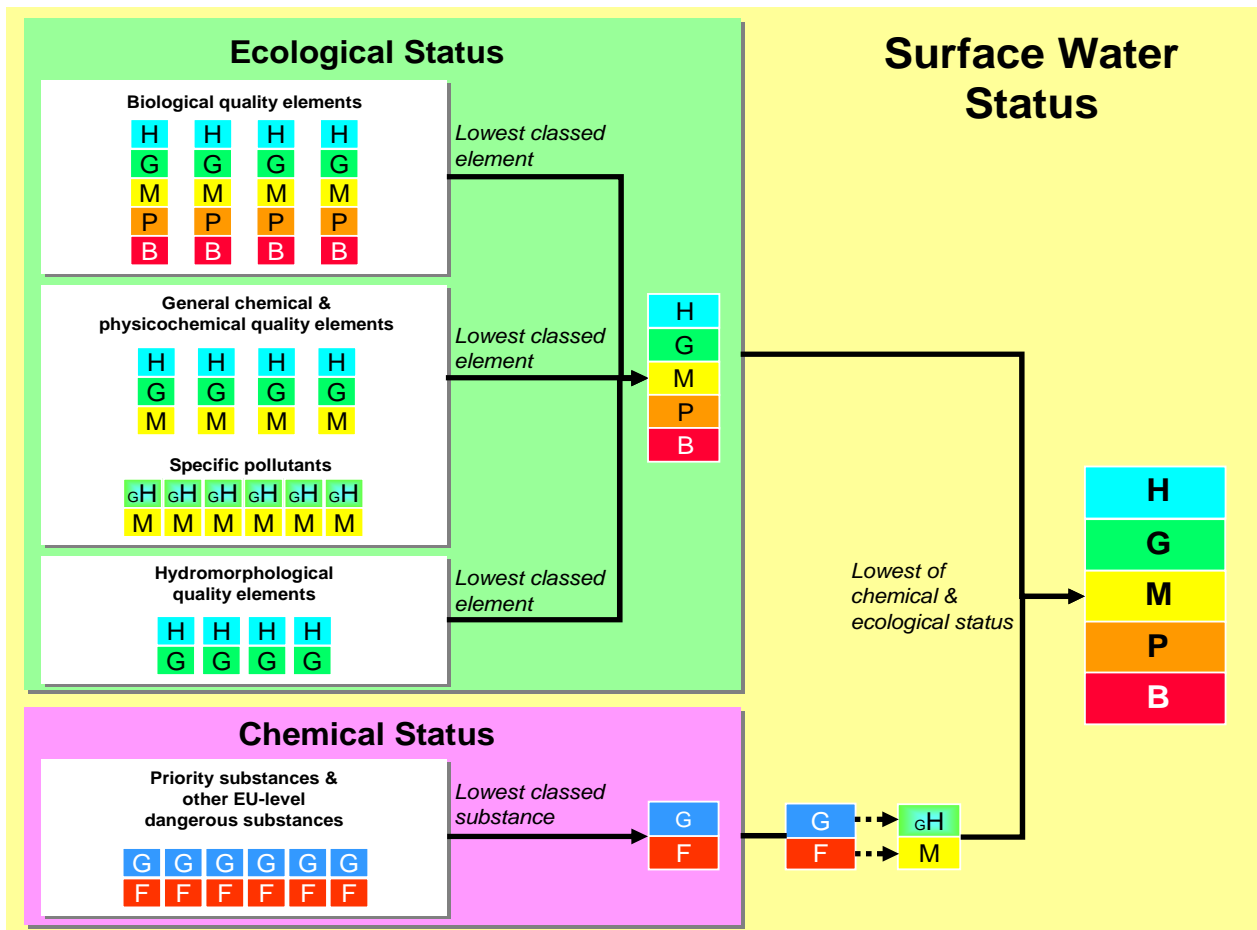
Priority 2 (P2) is to target water bodies where we have set a target to improve biological class by 2015. These contribute to our secondary objective of 15% of water bodies improving for one or more element, and will help us move additional water bodies towards Good Ecological Status

Priority 3 (P3) is to target chemical improvements in water bodies where biology status will remain less than good in 2015

Water bodies not currently being targeted may be referred to as **Priority 4 (P4)**

It is recognised that there are work programmes in other areas which are not reflected in a Status change but will contribute towards improvements

Appendix 8 – WFD Classification Information



Appendix 7 – Other Useful Information

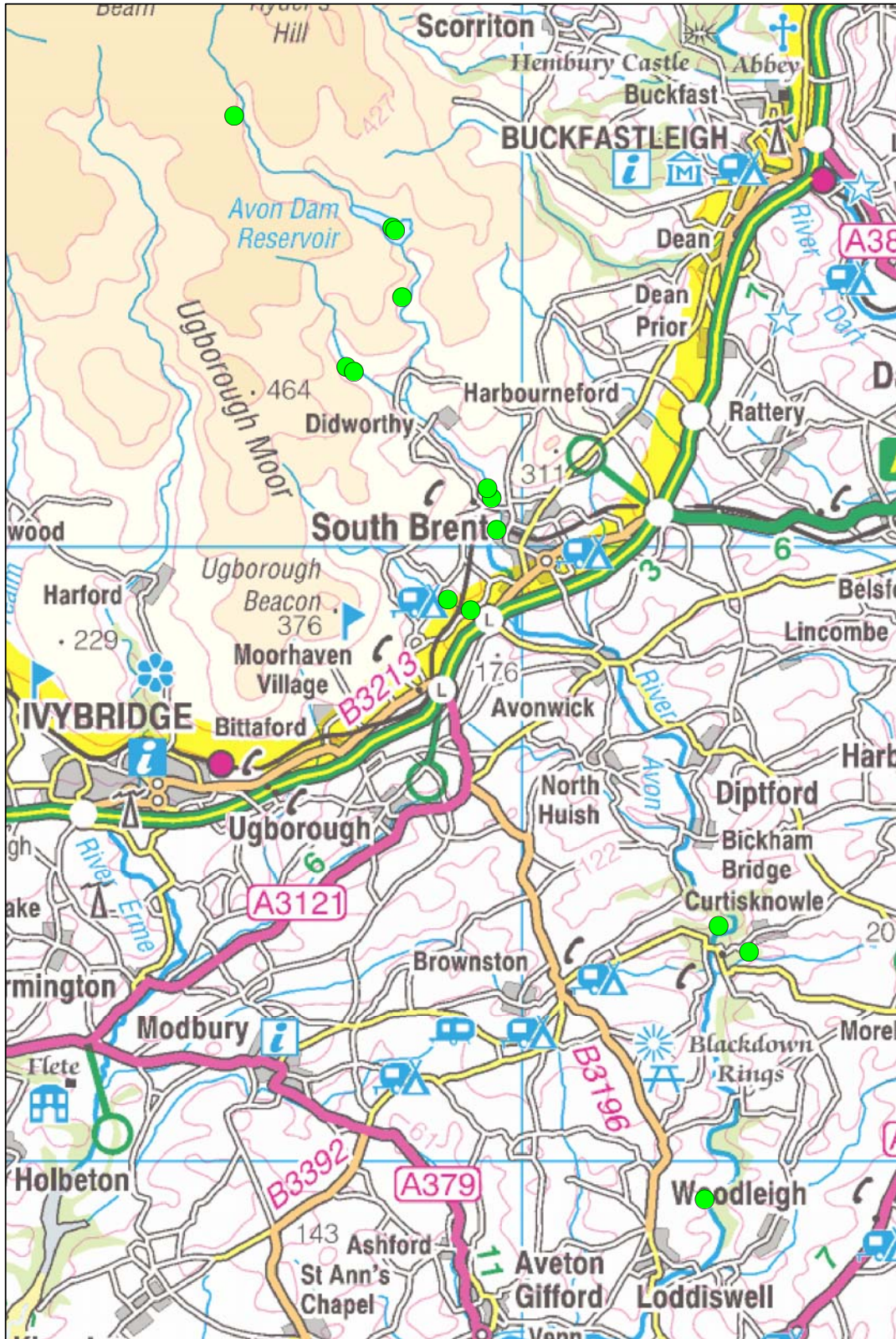


Figure 3 - Potential obstructions on the R. Avon

Table 2. Potential obstructions on the R. Avon

FEATURE	TYPE	SITE	FISHPASS	FISHPASSTY	EM Comments	EA_WB_ID	X	Y
DAM	ARTIFICIAL					GB108046004940	267889	65196
WEIR	ARTIFICIAL					GB108046004940	273697	53413
WEIR	ARTIFICIAL	Silveridge	Yes	Baulk	Not a problem	GB108046004940	272979	49384
WEIR	ARTIFICIAL	Old Avon Intake Weir				GB108046004940	268058	64059
WEIR	ARTIFICIAL	Lydia Rock Weir				GB108046004940	269507	60794
WEIR	ARTIFICIAL	Lower Weir	No		No longer there	GB108046004940	269171	58972
UNKNOWN	UNKNOWN	Curtisknowle	No		Not a problem	GB108046004940	273211	53833
WEIR	ARTIFICIAL	Crackhill	No		Island Weir – bypass channel	GB108046004940	269442	60958
WEIR	ARTIFICIAL	Bala Brook Intake				GB108046004940	267152	62933
WEIR	ARTIFICIAL					GB108046004940	268795	59149
WATERFALL	NATURAL					GB108046004940	265317	67016
WATERFALL	NATURAL					GB108046004940	267269	62859
WEIR	ARTIFICIAL					GB108046004940	267937	65154
WEIR	ARTIFICIAL					GB108046004940	269590	60275