ENVIRONMENTAL REPORT – COED DU STREAM

1. Introduction

Environment Agency Wales have requested a macro-invertebrate survey and an assessment of fish habitat in support of an application for an Abstraction Licence for the above watercourse.

For this purpose the stream was visited on 29th March 2012. Water level was *observed to be* very low and the abstraction not in operation. Macro-invertebrate kick samples were taken at 4 sites; upstream of the intake, downstream of the intake, at Gould Farm and between the A4019 and the confluence with the River Dulas. The dimensions of the channel and the nature of the substrate were noted at the same locations. Results are shown in Table 1.

Observations were made along most of the stream's length of the physical nature of the channel and its suitability as fish habitat

2. Physical character

The Coed Du stream is a small and steep watercourse with extensive cascades (some very steep) over bedrock, interspersed with short lengths of riffle and shallow pool with cobbles and pebbles. The gradient eases downstream of Gould Farm and especially downstream of the A4019.The substrate here is predominantly cobble and pebble with small areas of gravel. There are significant lengths of culvert below Gould Farm and under the A4019, though these were not examined for obstructions or substrate.

Approximately 15m downstream of the intake a tributary enters from the left bank. This is slightly smaller than the Coed Du stream and is estimated from maps to have a catchment area of approximately 25% of that of the Coed Du stream. This stream is not affected by the abstraction.

Channel width ranged from 1m to 1.5m upstream of the intake and downstream of the A4019 and between 1m and 3m elsewhere. Wetted width at the time of survey was generally 10 to 25% of the channel width with only a shallow trickle of water visible throughout the watercourse. No water at all was visible in a section immediately upstream of the A4019, presumably all flow being beneath the surface.

3. Macro-invertebrates

The macro-invertebrate fauna was very similar at all sites, being dominated by Heptagenidae, Perlodidae, Baetidae and Simuliidae. Hydropsyche sp., Perlidae, Chironomidae, Leuctridae and Philopotamidae were also found. This community is characteristic of clean, well-oxygenated upland watercourses and would be expected to be sensitive to reduced flows that reduce wetted width.

4. Fisheries

No fish were observed during the survey and the watercourse is considered to be impassable to fish upstream of Gould Farm, due to the very steep gradient. At the time of the survey water levels *throughout the stream* were considered to be too low to support **any** fish and if such low flows are present for any significant part of the year then it is unlikely to have a resident population of any fish species. In periods of higher flows the lower section, at least up to the A4019 (100m), and possibly up to Gould farm (400m), would be accessible to fish from the River Dulas. As higher

flows are likelier in the autumn/winter this could potentially provide a small area of spawning habitat for brown trout, though not all of this reach is of suitable substrate for spawning. The River Dulas is not itself accessible to migratory salmonids.

5. Abstraction operation

The maximum proposed abstraction rate is 30l/s with a hands-off flow of 2l/s, which is estimated as Q75. A flow of greater than 2l/s is only expected during the winter months and during short periods of high flows caused by heavy rain at other times.

6. Impact of abstraction

6.1 Macro-invertebrates

The watercourse is evidently extremely 'flashy' in nature, the channel being very steep in its lower part and the catchment small and steep throughout. At the time of the survey, in March, the watercourse appeared to have been almost dry for some time. This situation is said to be usual for at least half the year.

The macro-invertebrate fauna was typical of clean upland streams but would inevitably be restricted to a relatively small part of the channel for a prolonged period ie not utilising the full channel width. The impact of the abstraction of flows greater than the hands-off flow would therefore be much less than if the wetted width corresponded to the channel width for a significant period of time. The standard macro-invertebrate scoring system is therefore considered to exaggerate the impact in this instance and that the impact of the abstraction will be low in comparison to the natural stress imposed by natural flows. It is also noteworthy that despite this abstraction being in operation for some time, the macro-invertebrate fauna is virtually identical above and below the intake.

6.2.Fish

Upstream of Gould Farm the stream is impassable to fish moving upstream and it is very unlikely that there is a resident fish population above this point. Downstream of this point it is possible that fish, including brown trout, may sometimes move into the stream during periods of higher flows but because these conditions are sporadic and limited in duration, there is unlikely to be what can be described as a resident population as they would need to move out into the River Dulas for much of the time.

During the autumn/winter period more sustained high flows may attract brown trout into the lowest section (downstream of Gould Farm) and may permit a limited degree of spawning, though any eggs would be susceptible to drying out due to the natural low flows. In relation to the availability of spawning habitat available in the catchment,however, the area available in the Coed Du stream can be considered insignificant.

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10 May 2012

Table 1 Macro-invertebrates and physical characteristic if survey sites

Site	Location	NGR	Macro-invertebrates	Physical Characteristics
1	u/s Intake	SN802057	Heptagenidae Perlodidae Baetidae Hydropsyche sp. Simuliidae Chironomidae	Channel width - 1m Wetted width - 0.25m Substrate – Cobble/pebble dominant Flow - trickle
2	d/s Intake	SN801056	Heptagenidae Perlidae Perlodidae Baetidae Hydropsyche sp. Chironomidae Simuliidae	Channel width – 3m Wetted width – 0.3m Substrate – Cobble/pebble dominant (15m d/s substrate 100% bedrock) Flow - trickle
3	Gould Farm	SN797055	Heptagenidae Baetidae Perlodidae Leuctridae Philopotamidae	Channel width – 2m Wetted width – 0.4m Substrate – pebble/cobble dominant, some gravel Flow - trickle
4	d/s A4019	SN794055	Heptagenidae Baetidae Simuliidae Hydracarina	Channel width – 1.5m Wetted width – 0.3m Substrate – cobble/pebble dominant, some gravel Flow - trickle