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Contact details:

Post:

Ecological Appraisal Team Leader

Name:

Liz Locke

Address:

**Environment Agency, Lutra House, Dodd
Way, Off Seedlee Road, Walton Summit,
Bamber Bridge, Preston, Lancs, PR5 8BX**

by B.J. Ingersent

BIOLOGICAL REPORT - FISH MORTALITY, RIVER CONDER 21.7.79.

INTRODUCTION

Following a large scale fish mortality caused by a considerable spillage of a pentachlorophenol-based disinfectant from a mushroom farm, a biological survey of the river Conder was undertaken on 23.7.79. The disinfectant entered a small un-named beck which runs into the River Conder approximately a quarter of a mile downstream of Dam Head Bridge (O.S. Ref 499575). All fish life in the river Conder between the confluence with the polluted beck and the estuary at Conder Green appeared to have been killed and large numbers of brown trout and eels were in evidence as well as stone loach, bullheads, sticklebacks and even flatfish in the tidal reaches. A spillage of this same make of disinfectant from this mushroom farm in February 1976 caused a similar large scale fish mortality. On that occasion, the pollution appeared to have little effect on the benthic invertebrates of the river Conder, with no dead organisms found, although the small beck which received the spillage was quite badly affected and a number of invertebrate species were killed, notably Oligochaetes and Tipulidae. This recent spillage of disinfectant involved a considerably greater volume (approximately 900 gallons) than the 1976 discharge and so it was important to know whether the invertebrate fauna of the main river had been affected on this occasion.

METHODS

Kick samples were taken at a number of sites in the river Conder from the confluence with the polluted beck to Conder Green, the latter being a tidal reach. A control sample was also taken upstream of the confluence with the polluted beck. All samples were examined on site and live and dead invertebrates noted and identified as accurately as possible. (The species list for the river Conder is well documented following the 1976 pollution). At the tidal site the Gammarids were taken back to the Laboratory to be identified, this site not having been sampled in the previous survey.

The sampling sites were as follows :- (see map)

- SITE 1. River Conder 20m upstream of Ellet Bridge.
- SITE 2. River Conder 30m upstream of motorway Bridge.
- SITE 3. River Conder 150m downstream of polluted beck.
- SITE 4. River Conder 20m downstream of polluted beck.
- SITE 5. River Conder 15m upstream of polluted beck - Control site.
- SITE A. River Conder 100m downstream of Galgate Bridge.
- SITE B. River Conder at Conder Green,

The polluted beck had virtually dried up and it was felt not worth sampling.

VISUAL OBSERVATIONS

Large numbers of dead fish were observed at all sites downstream of the polluted beck. Brown Trout and eels were the most readily visible, the latter in particular including some very large specimens. Upstream of the polluted beck no dead fish were seen and in fact one or two "rises" were observed.

At a number of sites downstream of the polluted beck, large numbers of dead Oligochaetes were clearly visible on the river bed, and closer inspection revealed dead leeches, limpets and shrimps visible. This was particularly the case just downstream of the polluted beck and also at site A in Galgate where the river is very shallow and canalised.

RESULTS

The table of results shows the presence of live, dead and dying invertebrate species encountered in each sample. No relative abundances have been indicated as all live groups were "occasional" or "rare" apart from Mayflies which were "abundant" at each site.

COMMENTS

The 1976 pollution killed a number of invertebrate species in the small un-named beck. These were chiefly Oligochaetes, Tipulidae, chironomidae Mollusca, Cased Caddis and Hydracarina, No dead invertebrates were found in the main river however. This recent pollution involved a far greater volume

of disinfectant, and certain groups of invertebrates in the main river have been killed. The Oligochaetes appear to have been worst affected with large numbers of dead Eiseniella being found. Large numbers of dead freshwater limpets were also found along with Caddis larvae (both cased and free living), Gammarus pulex, leeches and Dicranota larvae. At site 1 one or two dead Baetis sp were found and one dead Limulus volckmani larva was found at site A otherwise these two species were found alive at other sites and in fact live Baetids were abundant at site 1.

No live Caddis were found at any of the sites downstream of the polluted beck but live cased caddis and Rhyacophila were present at the control site. Stone-turning at each downstream site revealed large numbers of empty caddis cases although few actual dead larvae were found. There were also large numbers of caddis pupae present in their cases but it was difficult to determine whether these were alive or not. Many appeared to have decomposed slightly and so it is reasonable to assume that the majority had probably been killed.

No live limpets were found at the downstream sites and large numbers were visible overturned on the river bed. A fair number of dead Gammarus pulex were also present at sites 2,3,4 and A although live specimens were found at sites 1 and 2 (One at site 1 was in fact "dying"). No dead Gammarids were found at the tidal site (B) and they were in fact abundant and seemingly healthy. Identification in the Laboratory revealed these specimens to be Gammarus zaddachi.

A number of dead leeches notably Erpobdella Octoculata were found at many downstream sites although one or two live specimens were found at sites 1 and 3. The fly larva Dicranota was both alive and dead at sites 2 and 4.

As already mentioned one or two dead Baetis sp were found at site 1 but here both Baetis rhodani and Baetis scambus were alive in large numbers. In fact at all sites except the tidal site, live Ephemeroptera were abundant and apparently healthy. Apart from the Baetids, Ecdyonurus sp and Ephemerella ignitis were all abundant even just downstream of the polluted beck. It would thus appear that this group has been relatively unaffected by the pollution. Similarly, Coleoptera larvae+adults, Hydracarina, Chironomidae and Asellus appear to have

been little affected. No stoneflies alive or dead were found at any of the downstream sites, and only one specimen a Leuctra sp was found at the control site. Similarly a Mayfly nymph Caenis sp was rare at the control site but not encountered at any of the downstream sites. Stoneflies were in fact fairly scarce on the 1976 survey. Large numbers of simuliidae were present at the control site but not found at any other site. It would seem feasible to suggest that these larvae have been affected by the pollution causing them to become unattached from stones, plants etc., and washed downstream, although no evidence of dead Simulidae was found.

Hydracarina which were killed in the polluted beck in 1976 were in fact found alive at a number of downstream sites, with no dead specimens being found.

CONCLUSIONS

Unlike the 1976 pollution this discharge of disinfectant has caused some invertebrate mortalities in the main river. The invertebrates affected appear to be the more "soft bodied" groups such as large Cligochaetes, leeches, caddis larvae, shrimps, limpets and certain fly larvae. Surprisingly, Mayflies appear to have been little affected and abundant live Baetis, Ecdyonurus and Ephemerella are present at all the freshwater sites. A number of other groups do not appear to have been affected including Chironomidae and Coleoptera.

Despite this loss of certain groups, some individuals of these groups survive (excepting Limpets and Caddis) and recolonisation by downstream drift can be expected to take place fairly readily. The presence of abundant live Mayflies and other groups means that a good supply of fish food organisms is still present in the river in the event of a fairly quick fish re-stocking.

Although dead sticklebacks and flatfish were found at Conder Green no dead invertebrates were encountered although only red chironomids and Gammarus zaddachi were found at the site.

B. Ingersent.

Biologist Levens.

RIVER CONDOR 23.7.79.

	Site 1	Site 2	Site 3	Site 4	Site 5 & control	Site A	Site B
LEUCTRA SP					✓		
BAETIS RHODANI	✓	✓					
BAETIS SCAMBUS	✓	✓					
BAETIS SP		†	✓	✓	✓	✓	
CAENIS SP					✓		
ECDYONURUS SP	✓	✓	✓	✓	✓	✓	
EPHEMERELLA IGNITA	✓	✓	✓	✓	✓	✓	
RHYACOPHILA SP		†	†		†		
GLOSSOSOMA SP				†			
LIENEPHILIDAE					†		
UNID CASED CADDIS				†	✓		
ELMIS AENIA L.		✓	✓		✓	✓	
LIENIUS VOLCKIARI L	✓	✓	✓	✓	✓		†
ELIMETHIDAE ADULT	✓	✓	✓				
HYDROPSORUS SP			✓		✓		
DYTISCIDAE ADULT		✓	✓		✓		
HYDRACARINA	✓	✓	✓		✓	✓	
CHIRONOMIDAE	✓	✓	✓	✓	✓	✓	✓
CLINOCCERA SP				✓		✓	
CULICIDAE	✓						
DICRANCTA SP	✓	✓	†	†	✓		
SIMULIDAE					✓		
ANCYLASTRUM FLUVIATILE		†		†			†
ABELLUS AQUATICUS	✓		✓				
GAMMARUS PULEX	✓ x	✓	†	†	†		†
GAMMARUS ZADDACHI							✓
EISENIELLA TETRAEDRA	✓	†		†	†		†
TUBIFICIDAE	✓	✓	✓		✓	✓	
BRACHIDELLA OCTOCULATA	✓	x	†	†	†		†
GLOSSIPHONIA COMPLANATA	✓		†				

Key:

Live. ✓
 Dying. X
 Dead. †

SKETCH MAP SHOWING SAMPLING SITES ON
RIVER CONDER (Not to scale).

