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HAMS HALL POWER STATION

A survey of the flora and fauna of freshwater  
habitats in the environs of Hams Hall Power Station, Birmingham

by

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HAMS HALL SURVEY

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## 1. Introduction

The proposed construction of a new coal burning power station at Hams Hall near Birmingham may affect large areas of land. Included in these areas are a number of ponds, ditches and streams. An environmental assessment of the whole site (terrestrial and aquatic habitats) is currently being undertaken before final decisions are made on siting the power station. This report on the aquatic habitats is based upon information collected during a 2-day visit to the site (29-30 July 1987). This involved visual assessment of all major water bodies and collection of larger invertebrates from selected representative habitats.

## 2. Methods

- 2.1 A total of 22 sites (Fig. 1) were visually assessed and samples of large invertebrates (mainly Coleoptera and Odonata) were taken in 15 of these. Thirteen of the 22 sites were ponds, the remainder streams or ditches.
- 2.2 Sampling was modified according to habitat but in general 'searching' effort was kept constant and in still waters approximately 6 sweeps with an FBA pond net (900  $\mu$ m mesh, 230 x 255 mm frame) constituted a sample. In running water, samples consisted of approximately 1-2 minutes of substrate disturbance upstream of the pond net. Larger invertebrates were picked out on site and preserved in formalin for subsequent identification.
- 2.3 At each site general morphological features were noted and emergent and submerged macrophytes recorded. The plant lists in Table are restricted to those in intimate association with the water. Riparian bankside vegetation is not recorded.

### 3. Description of sites

Each site is assigned a number or letter. Samples of invertebrates for further identification were taken only in numbered habitats. In the descriptions of ponds the terms small, medium or large are used to indicate area. These terms are here defined as small <200 m<sup>2</sup>, medium 200-300 m<sup>2</sup> and large >300 m<sup>2</sup>.

- 3.1 (1) Pond north of A446 turnoff. Medium sized pond with well developed littoral area. Aquatic vegetation (Ceratophyllum, Elodea, Lemna) well developed (see Table 1 for list). The pond is heavily shaded with alder and willow. Invertebrate fauna diverse and abundant (Table 2). 10-spined stickleback present.
- 3.2 (2) Pond south of A446 turnoff. Medium sized pond of similar appearance to (1) but shading less heavy and aquatic vegetation, especially Callitriche and Potamogeton (Table 1), better developed. Invertebrate fauna diverse.
- 3.3 (3) Small stream west of Newlands Farm. 1 m wide, shallow (20 cm deep), overgrown stream. Sampled area - open water as a result of cattle grazing/drinking. Relatively rich fauna with 10-spined sticklebacks in mating colours. No shading. Substrate of silty mud.
- (4) Same stream as (3) but a 5 m long riffly section about 150 m downstream. Densely shaded with steep eroded banks. Substrate of pebbles and gravel.
- Further downstream this stream receives some farm drainage and the substrate is covered with dense growths of filamentous algae.
- 3.4 (L) 'Reservoir' south of 'B' station. A large concrete sided water body supporting growth of Myriophyllum spicatum. Ostensibly a trout fishery.
- 3.5 (5) Pond by old 'A' station. A large area of interconnecting, mainly shallow (<40 cm) ponds with submerged and emergent vegetation. The substrate is a sandy mud with isolated boulders. The site is very open with no shading trees or bushes. The habitat is ideal for a variety of odonates and several specimens of Libellula depressa were in flight

during the sample visit. Frog tadpoles, newts and 3-spined sticklebacks were also recorded. The extensive, shallow littoral areas with emergent vegetation account for this site's diversity and richness. The pond appears to be in an early stage of development.

- 3.6 (M) Stream south of old 'A' station. A very slow flowing ditch-like stream polluted by oil spillage and some other unknown agent which caused vegetation (mainly nettles) to wilt.
- 3.7 (6) Pond south of arable field. A small to medium sized pond with some littoral areas of limited extent and fringed with Typha. No submerged vegetation was recorded. The pond is deeper (>40 cm) than pond (5) and appears to be older. The invertebrate fauna is diverse and abundant.
- 3.8 (N) Pond south-east of 'C' station. A large concrete sided 'reservoir'. Slightly polluted by oil spillage but supporting growth of Potamogeton pectinatus. The 'pond' is in active use and probably receives cooling water from 'C' station.
- 3.9 (7) Stream in field 11. A slow flowing stream about 2-3 m wide supporting a good variety of macrophytes (Table 1). Oil was present on the water surface. Indications are that this is not an isolated event and it may partly account for the relative paucity of the fauna which was dominated by the mollusc Lymnaea peregra. 3-spined sticklebacks were present.
- 3.10 (O) "Meadow Rue Field" - small ditch. A small 1 m wide ditch with clear water up to 50-60 cm in depth. Densely overgrown by Sparganium and other tall herbs. Small quantities of Elodea and Potamogeton? present. The only invertebrates taken in two sweeps were the molluscs Lymnaea stagnalis and Planorbis sp.
- 3.11 (P) Stream in Sych Wood. A small stream with a channel width of about 1 m. Densely shaded. Substratum mainly organic mud with twigs and leaves. Water level very low and actual water width only about 30 cm and about 2 cm deep.

- 3.12 (8) Stream in Church Pool covert. A small (up to 1 m wide) stream. The site, 6 m downstream of the outfall from a pond, was characterised by relatively high water velocity (ca.  $30 \text{ cm s}^{-1}$ ) and stony substrate of pebbles and gravel. The fauna was dominated by Gammarus pulex and the caddis Hydropsyche angustipennis and was lacking diversity.
- 3.13 (Q) Running water from pond system at north end of Ladywalk Nature Reserve. A stony bottomed section of 'stream' draining a pond system which may receive ash/water mix from the power station. The fauna consisting of leeches, water slaters, chironomids and worms indicates some organic pollution.
- 3.14 (9) A medium sized old pond to the north of the access track to the main hide. Shallow, littoral areas almost non-existent. Submerged vegetation limited to Myriophyllum. Sparse fringe of emergent species round edge of pond. Fauna sparse, no beetles or damselfly/dragonfly nymphs or molluscs. Fish lice abundant. It is possible that the restricted fauna is partly due to the presence of fish in the pond which is used for angling.
- 3.15 (10) A medium to large pond situated next to (9) and very similar in character and usage. The fauna is limited in diversity and beetles and gastropod molluscs were absent. Two large swan mussels were, however, taken in the net sweeps. While sampling, large carp (>30 cm in length) were spawning in the shallows. The presence of such fish will affect the faunal composition of the pond.
- 3.16 (11) Pond in front of main hide. A large open pond in an early stage of development. It has an extensive shallow littoral area and the bottom is a sandy mud with scattered stones. Elodea is the main submerged macrophyte and Typha, Phragmites and Carex fringe the pond. The fauna is rich and diverse and includes sticklebacks and tadpoles.
- 3.17 (12) A large 'duck' pond about 100 m from the hide. The pond is fringed with Typha and is not shaded. Many ducks use this pond and the littoral region, although shallow and potentially productive, is much affected by

the relatively high densities of birds. Repeated sweeps indicated a poor fauna dominated numerically by water boatmen with occasional chironomid larvae and the mollusc Potamopyrgus jenkinsi.

- 3.18 (R) 'Scrapes' adjacent to (12). Shallow (<15 cm) medium to large depressions recently created to encourage waders etc. The areas probably dry out in summer and do not at present support a fauna. The sites are open, lack vegetation and have a sandy mud substrate with scattered stones.
- 3.19 (13) Pond just outside south west corner of Reserve. A small sheltered pond situated in a depression. There is no shade from trees or bushes and vegetation is restricted to stands of Typha and Sparganium. The substratum is organic particulate material and shallow littoral areas are extensive and form a high proportion of the total area. The invertebrate fauna is diverse and relatively abundant. A common newt was taken in the sample and a toad was found near the pond.
- 3.20 (14) Ditch to east of (13). A stagnant water body about 2-3 m wide and 30 cm deep, shaded and with a substratum of organic mud overlain by a thick carpet of filamentous algae. This algal layer was sampled and contained 5 species of beetle. The ditch is fringed with Sparganium and Epilobium hirsutum. There were no traces of oil pollution in this habitat.
- 3.21 (15) Pond in area south east of survey area. A large old pond now used for angling and probably formed from gravel working. The sides are steep and shallow littoral areas at the sample point were absent. The substratum was stony and marginal aquatic vegetation was sparse. The fauna of invertebrates lacked diversity and water boatmen (Corixidae) dominated numerically. Both stickleback and stone loach were taken in the sample.

#### **4. The fauna**

- 4.1 Sixty eight invertebrate taxa were found during the survey (Table 2). Diptera are under-represented because most collections were confined to larger invertebrates which could be identified to species.
- 4.2 Coleoptera, Hemiptera and Odonata accounted for 19, 11 and 9 taxa respectively. Trichoptera were represented by only 5 taxa.
- 4.3 None of the recorded invertebrates are rare or endangered species but the variety of taxa indicate that this area provides a wide range of suitable habitats. Further collecting would no doubt increase the length of the lists for most of the sites.
- 4.4 Several vertebrate taxa were recorded during the survey. These include toad, frog, newt, stone loach, 3 and 10-spined stickleback and common carp. The presence of frogs, toads and newts indicate a 'healthy' environment.

#### **5. Overall assessment**

- 5.1 The area contains a wide variety of aquatic habitats. In general the main interest lies in the ponds which are in various stages of development. There are good examples of open shallow ponds (5, 11) in an early stage of development and shaded mature ponds (1, 2). Habitats used for angling or intensively by birds tended to have less invertebrate diversity.
- 5.2 Ditches in general were disappointing as regards vegetation and fauna and many of the sites were subject to periodic oil spillages or other pollutions. There were no ditches of special interest.
- 5.3 Streams were not well represented in the area. Site (3) had a high diversity but the composition of the fauna was more typical of standing waters. The faster flowing section (4) had a poor fauna possibly as a result of the lack of suitable habitats in the vicinity to provide colonizers. The same may be said of site (8) which also had a restricted fauna. Examination of the water chemistry and hydrology at

this site may help explain the lack of taxa. Site 7, a slow flowing stream, supported a wide variety of plant species but this was not mirrored by invertebrates. Again investigation of water chemistry may reveal pesticide traces or other substances which are affecting the fauna.

- 5.4 Brief surveys and visual assessment are not ideal methods of ascertaining the environmental value of habitats especially ponds where the sampling is restricted to a small area of the circumference. However the results should be considered as a minimum estimate of faunal diversity and relative abundance and as such can be used in decision making.
- 5.5 Of all the habitats considered in this survey the ponds are the richest and efforts should be made to conserve and manage them beneficially. A pond which receives no inflow is easier to maintain as it is partially isolated from the surroundings. Ditches and streams receive water from a wider catchment and consequently are harder to conserve in a healthy state as they will be affected by the management regime and other activities in the surrounding catchment.

## **6. Recommendations for habitat preservation and management**

- 6.1 Sources of pollution should be identified and if possible controlled. This is of particular relevance to streams and ditches and ponds receiving road drainage.
- 6.2 Dredging activities should attempt to leave a fringe of vegetation at the sides. This will provide a refuge for invertebrates and help consolidate the bank.
- 6.3 Dense shading can be used to control vegetation in an aquatic habitat but a greater diversity of fauna will result from selected thinning of riparian trees, bushes etc.
- 6.4 Shallow littoral areas are important to maintain a rich pond fauna and flora. Such areas in open locations tend to diminish with increasing age and clearing of selected areas will help to preserve the ponds status.



- 6.5 Ponds will benefit from careful dredging procedures where there is encroachment of peripheral vegetation. Maintenance of open water areas encourages birds and possibly colonization by aquatic insects especially beetles and dragon and damsel flies.
- 6.6 Scrape areas for waders could be improved. At present they are very shallow and probably dry out completely during the summer. They should be constructed so that the middle of each area is deep enough to retain water permanently. This would act as a refuge for invertebrates which could recolonize the shallow areas after flooding.

## **7. Conclusions**

- 7.1 The habitats, particularly the ponds, contained a wide variety of taxa.
- 7.2 No rare or endangered species of invertebrate were recorded in the survey.
- 7.3 Efforts should be made to minimise disturbance to the area. If ponds are destroyed as a result of construction activities it may be possible to persuade the contractors to scrape out another.
- 7.4 Ponds would benefit from a light management regime (see 6).
- 7.5 Ditches and streams are generally in a poor state and identification of sources of pollution should be undertaken prior to other management measures.
- 7.6 All efforts should be made to preserve the Ladywalk Reserve area which provides a wide range of habitats for both flora and fauna.

## **8. Acknowledgements**

I am most grateful to Mr J.H. Blackburn for identifying the invertebrates and to Diana Morton for typing this report.

Table 1. Plant taxa recorded in or intimately associated with sites at Hams Hall, Birmingham. (P = pond, D = ditch, S = stream) 29-30/6/87.

Taxa	P 1	P 2	S 3	S 4	P 5	P 6	P N	S 7	D O	S 8	P 9	P 10	P 11	P 12	P 13	D 14	P 15	
<u>Alisma plantago-aquatica</u>	+	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	4
<u>Apium</u> sp.	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	1
<u>Callitriche</u> spp.	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	2
<u>Carex acutiformis</u>	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	2
<u>Ceratophyllum</u> sp.	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Elodea</u> sp.	+	+	-	-	-	-	-	+	+	-	-	-	+	-	-	-	-	5
<u>Epilobium hirsutum</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	1
<u>Glyceria maxima</u>	-	-	-	-	-	-	-	+	-	-	+	+	-	-	-	-	-	3
<u>Iris pseudacorus</u>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Juncus effusus</u>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Lemna</u> sp.	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
<u>Mentha aquatica</u>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Myosotis</u> sp.	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Myriophyllum spicatum</u>	-	-	-	-	+	-	-	-	-	-	+	+	-	-	-	-	-	3
<u>Oenanthe</u> sp.	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	2
<u>Phragmites communis</u>	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	1
<u>Potamogeton pectinatus</u>	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	1
<u>Potamogeton obtusifolius?</u>	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	1
<u>Potamogeton crispus</u>	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	2
<u>Potamogeton</u> sp.	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	2
<u>Ranunculus sceleratus</u>	+	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	3
<u>Ranunculus</u> sp.	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	1
<u>Rorippa nasturtium-aquaticum</u>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Sparganium erectum</u>	+	-	-	-	-	-	-	+	+	-	+	+	-	-	+	+	-	7
<u>Typha angustifolia</u>	-	-	-	-	+	+	-	-	-	-	+	+	+	+	+	-	+	8
Total records	6	10	1	0	5	1	1	9	3	0	5	5	5	1	2	2	1	57



Taxa	P 1	P 2	S 3	S 4	P 5	P 6	S 7	S 8	S Q	P 9	Q 10	P 11	P 12	P 13	P 14	D 15	P	
ODONATA (dragonflies)																		
<u>Aeshna cyanea/mixta</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	1
<u>Libellula depressa</u>	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Sympetrum sanguineum</u>	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	1
<u>Sympetrum striolatum</u>	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	1
HEMIPTERA																		
<u>Callicorixa praeusta</u>	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	2
<u>Corixa/Hesperocorixa nymphs</u>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Gerris odontogaster</u>	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Gerris sp.</u>	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	2
<u>Hesperocorixa sahlbergi</u>	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Micronecta scholtzi</u>	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	1
<u>Notonecta sp. nymph</u>	-	-	-	-	+	-	-	-	-	-	+	+	-	+	-	+	-	5
<u>Sigara dorsalis</u>	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	2
<u>Sigara falleni</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	1
<u>Sigara fossarum</u>	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	1
<u>Sigara lateralis</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	1
COLEOPTERA																		
<u>Agabus bipustulatus</u>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Agabus sturmi</u>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Anacaena globulus</u>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Anacaena limbata</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	1
<u>Colymbetes fuscus</u>	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	2
<u>Dytiscus marginalis</u>	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>Dytiscus sp. larva</u>	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	1
<u>Haliphus immaculatus</u>	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	1
<u>Haliphus lineolatus</u>	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	1
<u>Haliphus ruficollis</u>	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	+	-	3
<u>Hydrobius fuscipes</u>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	2

Taxa	P 1	P 2	S 3	S 4	P 5	P 6	S 7	S 8	S Q	P 9	Q 10	P 11	P 12	P 13	D 14	P 15	
<u>Hydroporus palustris</u>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	2
<u>Hydroporus planus</u>	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	2
<u>Hygrobia hermanni</u>	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	1
<u>Hygrotus inaequalis</u>	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	2
<u>Ilybius ater</u>	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
<u>Ilybius fuliginosus</u>	+	+	+	-	-	-	-	-	-	-	-	-	-	+	-	+	5
<u>Laccobius minutus</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	1
<u>Laccobius sp. larva</u>	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	1
TRICHOPTERA																	
<u>Athripsodes aterrimus</u>	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	1
<u>Hydropsyche angustipennis</u>	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	1
<u>Limnephilus flavicornis</u>	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	1
<u>Limnephilus sp.</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	1
<u>Plectrocnemia conspersa</u>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	1
DIPTERA																	
Ceratopogonidae	+	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	3
Chironomini	-	-	-	-	+	+	-	-	+	+	+	+	-	-	-	-	6
Orthoclaadiinae	-	-	-	-	+	-	-	-	+	+	-	-	+	-	-	-	4
<u>Prodiamesa oliveacea</u>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tanypodinae	+	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	3
<u>Dicranota sp.</u>	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	1
Sciomyzidae	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VERTEBRATA																	
<u>Gasterosteus aculeatus</u>	-	+	+	-	+	-	+	-	-	-	+	-	-	-	-	-	5
<u>Pungitius pungitius</u>	+	+	-	-	-	-	-	-	-	-	-	+	+	-	-	+	5
<u>Noemacheilus barbatus</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	1
<u>Cyprinus carpio</u>	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	1
<u>Triturus sp.</u>	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	2
<u>Bufo bufo</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	1
<u>Rana temporaria?</u>	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	2
Total records	13	10	11	4	13	13	4	5	4	7	11	18	9	9	5	9	145

Fig. 1 Location of sites

