

PROGRESS REPORT OF BIOLOGICAL MONITORING AT PINKHILL MEADOW:

AUTUMN 1990-WINTER 1991

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SUMMARY

1. National Pond Survey standard macroinvertebrate samples have been collected in two seasons (summer and autumn 1990) from the Main Pond, the Groundwater Pond, the Surfacewater Pond and the Scrape. The majority of macroinvertebrate species recorded were bugs and beetles, which fly freely to new ponds. Numerically, the fauna was dominated by mayflies. Several local species have already been recorded from the ponds.
2. Water quality measurements have not yet started.
3. Monitoring of wetland plants is programmed for summer 1991. However, preliminary observations have shown that several species of wetland plants have already colonised the ponds. Clear differences in the rates of colonisation of different areas are also apparent.
4. Preliminary analysis of bird records for Farmoor for 1988-1990 shows that wader monitoring should be undertaken in April-May and July-September. This work will start in spring 1991. Preliminary observations have recorded two species of wader using the new ponds.

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1. AQUATIC INVERTEBRATES

1.1 Aquatic macroinvertebrates

Macroinvertebrate sampling was started shortly after the completion of the Phase 1 excavations. National Pond Survey standard surveys were carried out on 26 July 1990 and in November 1990. All four waterbodies (Main Pond, Groundwater Pond, Surfacewater Pond and Scrape) on the site have been sampled on each visit. Casual collections have also been made at other times.

The first colonists were the small hydrophilid water beetles Helophorus brevipalpis and H. granularis which were recorded shortly after the excavations were completed. Following this other early colonists were the pond olive mayfly (Cloeon dipterum), the lesser water boatman Sigara lateralis and S. nigrolineata and several species of water beetles.

In the first full survey (July) 4-7 species of macroinvertebrate (in the groups surveyed) were found in each pond (see Table 1). By November the number of species recorded had at least doubled in all the ponds with 13 to 21 species being found in each pond (see Table 1). The fauna continued to be dominated by the highly mobile bugs and beetles (74% of the 38 species recorded). However, 5 species of mayfly had already colonised, along with the first three caddisfly species. The first small larvae of Sympetrum species, presumably from oviposition observed in September (see Section 1.2), were also recorded. Also one species of leech, Helobdella stagnalis, was recorded.

One nationally rare species has already been recorded, the small diving beetle Coelambus nigrolineatus. This species is listed as RDB3 in the Insect Red Data Book (Shirt, 1987), although as a new colonist of Britain its status is still uncertain.

Several other uncommon or local species have also been recorded and are marked with a * in Table 1.

The occurrence of rare and uncommon species suggests that the Pinkhill meadow wetlands have the potential to support a rich macroinvertebrate community.

1.2 Adult dragonflies

Adult dragonflies were observed over the new ponds in August and September, although no systematic observations were made. By November small nymphs of a Sympetrum species, probably striolatum were recorded in the Surfacewater Pond (see Table 1).

SPECIES	DATE	OBSERVATIONS
Enallagma cyathigerum	4 Aug	Flying over Groundwater Pond.
Sympetrum striolatum	4 Aug	Flying over the Surfacewater Pond.
	22 Sept	One pair in tandem, ovipositing in the Scrape.

Other species probably visited the ponds unobserved.

1.3 REFERENCE

Shirt, D. (Ed.) (1987). British Red Data Books: 2. Insects. Nature Conservancy Council, Peterborough.

TABLE 1. Aquatic macroinvertebrates recorded at Pinkhill Meadow in National Pond Survey standard samples collected in summer and autumn 1990.

MP = Main Pond GW = Groundwater Pond SW = Surfacewater Pond SC = Scrape.
 * = nationally local species. *(Ox) = species local only in Oxfordshire.

Sample 1 1 x 3 minute sample from MP, GW, SW and SC, collected 26 July 1990.

Sample 2 1 x 3 minute sample from MP, GW, SW and SC, collected November 1990.

	MP		GW		SW		SC	
	1	2	1	2	1	2	1	2
HIRUDINEA								
<i>Helobdella stagnalis</i>	-	1	-	-	-	-	-	-
EPHEMEROPTERA								
<i>Caenis luctuosa</i>	-	116	-	896	-	464	-	228
<i>Caenis horaria</i>	-	-	-	-	-	-	-	8
<i>Cloeon dipterum</i>	-	44	5	1936	1	1664	45	32
* <i>Cloeon simile</i>	-	-	32	-	-	-	-	28
<i>Ephemera vulgata</i>	-	-	-	1	-	1	-	-
ODONATA								
<i>Sympetrum</i> sp. (?striolatum)	-	-	-	-	-	2	-	-
TRICHOPTERA								
* <i>Leptocerus tineiformis</i>	-	-	-	-	-	-	1	-
<i>Mystacides longicornis</i>	-	-	-	1	-	1	-	-
<i>Oecetis ochracea</i>	-	2	-	-	-	-	-	2
HEMIPTERA								
*(Ox) <i>Arctocorisa germari</i>	-	-	-	5	-	2	-	2
<i>Callicorixa praeusta</i>	-	2	1	5	-	-	1	1
* <i>Corixa panzeri</i>	-	-	-	2	-	4	-	-
<i>Corixa punctata</i>	-	-	-	-	-	1	-	-
<i>Cymatia coleoptrata</i>	-	-	-	-	-	1	-	-
* <i>Sigara concinna</i>	-	2	-	-	-	2	-	2
<i>Sigara distincta</i>	-	-	-	2	-	1	-	-
<i>Sigara dorsalis</i>	-	-	-	1	-	-	-	-
<i>Sigara falleni</i>	-	-	-	6	-	-	-	-
<i>Sigara lateralis</i>	3	40	3	58	-	37	5	45
<i>Sigara nigrolineata</i>	-	1	2	40	-	3	2	1

TABLE 1. Aquatic macroinvertebrates recorded at Pinkhill Meadow in (cont.) National Pond Survey standard samples collected in summer and autumn 1990.

MP = Main Pond; GW = Groundwater Pond; SW = Surfacewater Pond; SC = Scrape
 Su = Summer 1990; Au = Autumn 1990. * indicates local species. *(Ox)
 indicates species local only in Oxfordshire.

	MP		GW		SW		SC	
	1	2	1	2	1	2	1	2
COLEOPTERA								
<i>Agabus bipustulatus</i>	-	-	-	1	-	-	-	-
<i>Agabus nebulosus</i>	-	-	-	-	-	2	-	-
<i>Coelambus confluens</i>	-	4	-	-	-	1	1	-
* <i>Coelambus nigrolineatus</i>	-	1	-	-	-	-	-	-
<i>Colymbetes fuscus</i>	1	-	-	-	2	-	-	-
<i>Dryops</i> sp. (fem.)	-	-	-	-	1	-	-	-
<i>Helophorus brevipalpis</i>	-	-	2	-	2	2	-	-
<i>Helophorus grandis</i>	-	-	-	-	-	-	-	1
* <i>Hydroglyphus pusillus</i>	-	12	1	23	-	36	1	1
<i>Hydroporus palustris</i>	1	-	-	-	1	-	-	-
<i>Hydroporus planus</i>	-	-	-	-	1	3	-	-
<i>Hygrotus inaequalis</i>	-	-	-	-	-	1	-	-
* <i>Laccobius striatulus</i>	1	4	2	3	-	-	1	-
<i>Laccophilus minutus</i>	-	1	-	-	-	2	-	-
<i>Ochthebius dilatatus</i>	-	1	-	-	-	-	-	-
<i>Oulimnius tuberculatus</i>	-	-	-	-	-	-	-	1
*(Ox) <i>Rhantus suturalis</i>	-	-	-	1	-	-	-	-

NOTE: *Coelambus nigrolineatus* is RDB3. The identification was confirmed by G. Foster.

The following additional Coleoptera species have been found at the site during casual collecting.

Helophorus granularis
Hydroporus marginatus
Laccobius sinuatus

DIPTERAN FAMILIES

Ceratopogonidae
Chaoboridae
Chironomidae
Culicidae
Psychodidae
Scathophagidae
Tipulidae

2. WATER CHEMISTRY

The programme of chemical sampling has yet to be arranged.

3. WATER PLANTS

Mapping of the vegetation of the ponds is not programmed until summer 1991. However, casual observations made in the course of other visits have shown two noticeable and interesting developments.

(i) The large quantity of algae, charophytes and Alisma plantago-aquatic growing in the trench prepared for the Phragmites bed.

(ii) The rapid development of terrestrial vegetation on the area of the scrape margin where topsoil was dumped.

In addition, several species (or groups) of plants have colonised the ponds during 1990. Notes on their distributions and approximate dates of first appearance are given in Table 2.

TABLE 2. Notes on the colonisation of the Pinkhill Meadow ponds by wetland plants.

Filamentous algae	Growing in the north-west corner of the Main Pond.
Charophyta	Colonising Main Pond quite extensively by 4 August. Also growing in the Scrape. Apparently none in the Surfacewater Pond. By 1 September, very little growing in the Groundwater and Surfacewater Ponds or the Scrape, mostly growing in the Main Pond.
<i>Alisma plantago-aquatica</i>	Coming-up in abundance in the <u>Phragmites</u> trench by 1 September.
<i>Callitriche</i> sp.	Small amount in the Main Pond.
<i>Polygonum amphibium</i>	Single plant in Main Pond on 4 August. One small plant in the Groundwater Pond by 8 September. Also <u>Sparganium emersum</u> in the Groundwater Pond.
<i>Ranunculus sceleratus</i>	Quickly appeared in some abundance in the <u>Phragmites</u> trench.
<i>Ranunculus</i> sp.	One plant growing in the Main Pond by 8 September.
<i>Sparganium emersum</i>	A small amount apparent in the Main Pond by 1 September.
<i>Typha</i> sp.	Single small plant pulled-up from the Main Pond.
Grassland plants	By 4 August <u>Deschampsia caespitosa</u> , <u>Ranunculus repens</u> , <u>Carex flacca</u> , <u>Filipendula ulmaria</u> and <u>Sanguisorba officinalis</u> had all germinated on the top-soil margin of the Scrape.

4. BIRDS

4.1 Objectives of the bird monitoring work

The original objectives of bird monitoring work were:

- (i) To record the species using the site.
- (ii) To determine whether any increase in the use of Pinkhill by waders occurs following the construction of the new wetlands.
- (iii) To investigate the use by water birds of specific features within the Main Pond and Scrape.

(See Pond Action's document 'Proposal for survey and experimental management of wetland habitats at Pinkhill Meadow', September 1990.)

As a result of the preliminary site survey work and analysis of Farmoor Reservoir wader counts, it is now possible to refine these objectives. Refinements are discussed in more detail in Sections 4.3 and 4.4.

4.2 Timing of the bird monitoring work

Preliminary analysis of data on the use of Farmoor Reservoir by wading birds between 1988 and 1990 has been made (see Figure 1). The data was gathered by birdwatchers visiting the site and compiled by Mr John Brucker of the Oxford Ornithological Society. Figure 1 shows total wader-days (all species combined) in each month of the year (1 = January, 12 = December). Bars are in groups of three: the first bar in each group represents 1988, the second 1989 and the third 1990.

The graph shows the typical peaks of activity which characterise wader migration. Movements at Farmoor are most pronounced in April and May ('spring passage') and July, August and September ('autumn passage'). Very few wading birds are present at Farmoor in January, February, March, June, October, November or December.

As observations of the autumn passage in 1990 could not be started at the beginning of migration period this phase of monitoring was postponed until the 1991 season. Observations will now begin during the spring passage in mid-late March 1991.

Further examination of the Farmoor data back to 1985 will also investigate:

- (i) Numbers of wader species using Farmoor Reservoir.
- (ii) Evidence of change in the number of wading birds visiting Farmoor Reservoir in the years 1985-1990.

4.3 Objective 1: recording birds, particularly waders, using Pinkhill Meadow wetlands

The wading birds using Pinkhill Meadow will be recorded by two methods:

- (i) Casual records gathered by birdwatchers visiting the site (in fact the site is well-watched with visits on most days of the year). A log book will be placed in the new hide specifically for this purpose.
- (ii) By periods of known effort recording undertaken by Pond Action in the spring and autumn passage (note that known effort recording is mainly required for Objective 2 but will obviously also provide results relevant to Objective 1).

4.4 Objective 2: determining whether there is any change in the use of Farmoor by waders following the creation of the Pinkhill wetlands

Comparison of the Farmoor Log-book data (1985-1990 and post-1990)

Records of birds reported by visiting birdwatchers in the Farmoor Log-book will provide the basis for a rough assessment of change in wader numbers. The 1985-1990 records will be compared with similar data post-1990.

Known effort recording during wader passage

The Log-book data is based on variable observer effort. For this reason it will also be necessary to monitor the use of the reservoir and Pinkhill wetlands by passage waders more systematically with known observer effort. This will be done independently by Pond Action and will allow us to calibrate the more variable recording work of local birdwatchers.

Two all-day visits will be made at the beginning of the spring passage in 1991 to determine the best times of day for observing.

Counts will then be repeated on random days in the spring passage (days will be allocated so that the same number of days are spent in April and May).

Assuming that reliable counts can be made without remaining all day at the site it should be possible to make about 24 x 3hr visits to the site during April and May 1991 (ie c10 8hr days).

Identification of a control site

A control site (ideally another reservoir) where passage wader numbers can be monitored is also required. This will provide information on any general changes in the use of inland sites by waders. In theory this will provide evidence as to whether any changes in numbers of birds at Farmoor are due to the creation of the Pinkhill wetlands or to more general changes in the numbers of waders inland.

Although we are not yet certain of finding a good control site,

Boddington Reservoir in Northamptonshire has been suggested as a possible candidate. The use of this site will be investigated further.

4.5 Wetland birds recorded at Pinkhill Meadow during preliminary visits

Preliminary visits, between 1.5 and 3 hours long, were made on 8 occasions between July 1990 and February 1991. The species recorded are listed in Table 3.

During these visits two species of wader, Common Sandpiper and Snipe, were recorded. No other waders were recorded from the Pinkhill wetlands in the Farmoor Log-book between 1 October 1990 and 4 February 1991. Although a few other wetland species have been seen at the Scrape or the Main Pond (see Table X) our impression is that, at present, few birds are using the new wetlands. This probably reflects the relative immaturity of the new habitats and the disturbance caused by passing walkers.

TABLE 3. Wetland birds recorded on Pinkhill Meadow during preliminary observations made between July 1990 and February 1991.

MONTH	July		August		September			February
	1990	1990	1990	1990	1990	1990	1991	
DATE	10	4	1	2	8	22	24	3
TIME OF VISIT	(1430-1600)		(1600-1800)	(1915-2030)	(1030-1130)	(1200-1430)	(0715-0800)	(1345-1645)
Common sandpiper	2	1	-	5	-	-	-	-
Dunlin (see note)	-	-	-	-	-	*	-	-
Snipe (see note)	-	-	-	-	-	-	-	2
Common Tern	-	-	-	6	-	-	-	-
Pied Wagtail	4	1	P	1	-	2	-	-
Yellow Wagtail	-	-	P	-	-	-	-	-
Reed Bunting	1	-	-	-	-	-	-	-
Canada Goose	-	-	-	-	-	6	-	-
Black-headed Gull	-	-	-	-	-	-	-	1

NOTE: Dunlin were heard flying over Pinkhill Meadow but were not seen to use any of the new wetlands. Snipe were feeding on flooded grass beside the Main Pond.

P = present but not counted.

FIGURE 1. WADER-DAYS AT FARMOOR RESERVOIR, 1988-1990.

