ENGLISH NATURE

A survey of the aquatic macroinvertebrates of ponds in the Godstone Ponds SSSI, Surrey

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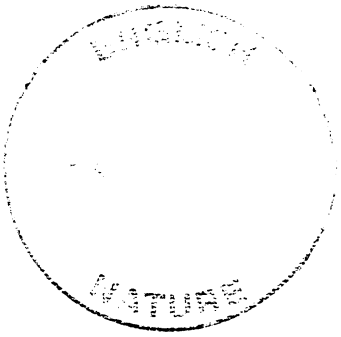
No 3

A SURVEY OF THE AQUATIC MACROINVERTEBRATES OF PONDS IN THE GODSTONE PONDS SSSI, SURREY

A REPORT TO ENGLISH NATURE



POND ACTION
DECEMBER 1991

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SUMMARY

This report describes the results of a survey of the aquatic macroinvertebrates of three ponds (Bay, Leigh Mill and Leigh Place ponds) in the Godstone Ponds SSSI. Survey work was undertaken on 30 November 1991.

Bay Pond supported the richest macroinvertebrate community of the three ponds, with 49 species recorded. Leigh Mill Pond and Leigh Place Pond supported more impoverished communities, with 32 species and 23 species recorded, respectively.

4 local species (species which are either only common in the south-east of England or more widespread but uncommon) were recorded from Bay Pond. No local species were recorded in either Leigh Mill Pond or Leigh Place Pond.

The results of the survey suggest that the macroinvertebrate community of Bay Pond is of intermediate to high nature conservation value. The macroinvertebrate communities of Leigh Mill Pond and Leigh Place Pond are probably of low to intermediate nature conservation value.

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TABLES

1. INTRODUCTION

This report describes the results of surveys of aquatic macroinvertebrates in the three ponds of the Godstone Ponds SSSI (near Godstone, Surrey). Survey work was undertaken on 30 November 1991. The ponds surveyed were:

Bay Pond (TQ 353416)
Leigh Place Pond (TQ 360509)
Leigh mill Pond (TQ 362509).

2. METHODS

2.1 Aquatic macroinvertebrate surveying

Aquatic macroinvertebrates were collected by vigorous sweeping of microhabitats in the ponds (ie areas of different vegetation, substrate and bank type). Samples were mostly collected using a standard 1mm mesh pond net, with a Naturalist's dredge used to obtain samples from deeper water. All perceived microhabitats within the pond were surveyed. Effort was concentrated on those microhabitats which appeared to be the richest in macroinvertebrate taxa.

Samples were sorted on site and macroinvertebrates identified in the field, where possible. Species which could not be identified immediately were preserved in 70% ethanol and returned to the laboratory for microscopic examination. Approximately two and a half hours were spent sampling and sorting at each pond.

Bankside sorted surveys generally give fairly comprehensive species lists when undertaken by experienced collectors, but they do **not** provide results which are strictly comparable with the work of other collectors (even very experienced collectors are known to produce lists which differ considerably). The aquatic macroinvertebrate groups recorded are listed in Table 1. A list of the keys and guides used in identification of macroinvertebrates is given in the References.

2.2 Assessment of the conservation value of the macroinvertebrate communities of the ponds

Pond Action has devised a system for assessing the conservation value of ponds which places sites into one of four categories: very high, high, intermediate or low. However, this approach is only valid for survey data gathered using National Pond Survey (NPS) methods. For assessing the value of macroinvertebrate communities, this requires comparisons of 3-minute timed samples which are then sorted under laboratory conditions (Pond Action, 1989). The criteria used to assess conservation value using this system are listed in Table 2

Since the relatively quick bankside sorted samples used for assessing the Godstone ponds are not strictly comparable with 3-minute timed samples, we have used the results to:

(i) make an assessment of the **relative** conservation value of the aquatic macroinvertebrate communities of the three ponds (since all three ponds were sampled with the same amount of effort, numbers of species collected, and numbers of uncommon species, can be compared internally).

(ii) suggest, on the basis of our subjective impressions, which of the four categories of conservation value (see Table 2) we believe the ponds would fall into, if surveyed using standard NPS methods.

TABLE 1. GROUPS OF AQUATIC MACROINVERTEBRATES COLLECTED IN THE GODSTONE PONDS AND IDENTIFIED TO SPECIES LEVEL

GROUPS IDENTIFIED TO SPECIES LEVEL

Tricladida	(Flatworms)
Hirudinea	(Leeches)
Gastropoda	(Snails and limpets)
Unionidae	(The larger bivalves)
Malacostraca	(Shrimps and slaters)
Ephemeroptera	(Mayflies)
Odonata	(Dragonflies and damselflies)
Heteroptera	(Water bugs)
Megaloptera	(Alderflies)
Trichoptera	(Caddis-flies)
***Coleoptera**	(Water beetles)

*Adults from the following families of Coleoptera were identified: Gyrinidae, Haliplidae, Dytiscidae, Hydraenidae, Hydrophilidae, Noteridae.

No Plecoptera (stoneflies) were found during this survey.

TABLE 2. CRITERIA USED TO ASSESS THE NATURE CONSERVATION VALUE OF AQUATIC MACROINVERTEBRATE COMMUNITIES USING THE NATIONAL POND SURVEY METHODOLOGY.

CONSERVATION VALUE	DESCRIPTION OF COMMUNITY
VERY HIGH	Supporting a species-rich macroinvertebrate community, including rare (ie Red Data Book) species. Note that some sites with rare species may be relatively species-poor.
HIGH	Supporting a rich community of common macroinvertebrate species and a number of local species.
INTERMEDIATE	Supporting a moderate to poor community of common species with only a few local species.
LOW	Supporting a moderate to poor community of common species with no local species.

Within the two higher categories individual sites can be ranked on the basis of numbers of rare and uncommon species, **provided that a constant amount of effort in sampling has been made.**

3. THE AQUATIC MACROINVERTEBRATE COMMUNITIES OF THE GODSTONE PONDS

A list of the species recorded in the three ponds is given in Appendix 1. Numbers of species recorded in the major taxonomic groups are given in Table 3.

3.1 Aquatic macroinvertebrate community type

All three ponds supported aquatic macroinvertebrate communities which were relatively rich in snails and leeches. This type of community is typical of large, permanent, often old ponds in lowland Britain (Pond Action, unpublished results).

3.2 Species richness of the macroinvertebrate communities

Bay Pond supported the richest macroinvertebrate community with 49 species recorded.

Leigh Mill Pond and Leigh Place Pond supported more impoverished communities.

In Leigh Mill Pond 32 species were collected. Few areas yielded many species and most species were recorded in emergent vegetation along the north bank.

Leigh Place Pond appeared to have a very poor macroinvertebrate community with only 23 species recorded. There was very little suitable habitat for macroinvertebrates and most species were recorded in a small area close to the outflow in the north-east corner. In addition to the low number of species recorded, very few individuals of any species were found.

3.3 Rare and uncommon macroinvertebrate species

Four local macroinvertebrate species were recorded in the survey. No rare (ie Red Data Book) species were found. All four local species were found **only** in Bay Pond with no local species collected from either Leigh Mill or Leigh Place ponds. Three of the local species recorded, *Bithynia leachi* (Leach's Bithynia), *Ranatra linearis* (the water stick insect) and *Hygrobia hermanni* (the screech beetle) are relatively common in south-east of England although more restricted in other parts of Britain. One species, *Glossiphonia heteroclita* (a leech) is uncommon, though widely distributed, over much of England. Notes on the national distribution of these species are given in Appendix 3.

It should also be noted that this assessment is based on data from a single season of survey. Work by Pond Action (unpublished results) suggests that collecting in three different seasons of the year (ie spring, summer and autumn) usually results in the recording of 30-50% more species than are found in a single season. It is possible that, amongst these new species, further uncommon species could be recorded.

3.4 Conservation value of the aquatic macroinvertebrate communities

Bay Pond (with a relatively rich community and several local species) supported a community which should probably be regarded as being of moderate to high nature conservation value.

Leigh Mill Pond and Leigh Place Pond, supported communities which were relatively poor or very poor in species, with no local species. These communities should probably be regarded as of low, or possibly intermediate, nature conservation value..

TABLE 3. NUMBERS OF SPECIES WITHIN MAJOR TAXONOMIC GROUPS IN THE GODSTONE PONDS

GROUP	BAY TQ 353516	LEIGH PLACE TQ 360509	LEIGH MILL TQ 362509
TRICLADIDA (Flatworms)	3	2	2
HIRUDINEA (Leeches)	5	1	5
GASTROPODA (Snails and limpets)	12	7	9
UNIONIDAE (Large bivalves)	1	0	0
MALACOSTRACA (Shrimps and slaters	3	2	2
EPHEMEROPTERA (Mayflies)	1	2	1
ODONATA (Dragonflies and damselflies)	2	1	1
MEGALOPTERA (Alder-flies)	1	1	1
HETEROPTERA (Bugs)	8	7	6
TRICHOPTERA (Caddis-flies)	2	1	0
COLEOPTERA (Beetles)	11	0	5
TOTAL SPECIES	**49**	**23**	**32**

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APPENDICES

A1. DESCRIPTIONS OF THE INDIVIDUAL MACROINVERTEBRATE COMMUNITIES OF THE GODSTONE PONDS

1.1 Bay Pond

Of the three Godstone Ponds, Bay Pond had the highest number of species in all the major taxonomic groups, with the exception of the Ephemeroptera. The numerically dominant species at the site was the water slater, *Asellus aquaticus*. A leech, *Piscicola geometra*, an ectoparasite of fish, was also unusually common.

Of the habitats available for macroinvertebrates at the site, the richest appeared to be the west margins with stands of water mint (*Mentha aquatica*), branched bur-reed (*Sparganium erectum*) and small areas of grassy bank. Several species of beetle were recorded here. The beds of common reed (*Phragmites australis*) were also quite rich in macroinvertebrates. The alder carr yielded few species not recorded in other areas though *Agabus paludosus*, a diving beetle associated with spring fed sites and running water, was found here.

The local species *Ranatra linearis* (the Water Stick Insect) was recorded from the south bank amongst emergent vegetation, other local species being recorded several times around the site.

Only one species of caseless caddis (only one specimen) was recorded from the site, which may reflect the almost total absence of aquatic vegetation.

1.2 Leigh Place Pond

Leigh Place Pond had the poorest macroinvertebrate community of the three sites surveyed. The only group relatively well represented in comparison with the other two ponds in this survey was the Heteroptera (7 species). No water beetles were recorded during the survey despite extensive searching.The water slater, *Asellus aquaticus*, was the only macroinvertebrate present in large numbers at the site.

Few good habitats (eg extensive plant stands or flooded marginal grasses) were available for macroinvertebrates. The richest habitat was the marginal herbaceous vegetation near the outlet in the north-east corner. Most of the species recorded from the site were found here. Unlike the other ponds surveyed, Leigh Place Pond had areas of exposed gravel. This may have accounted for the presence of the mayfly, *Caenis horaria* and the leptocerid caddis, *Athripsodes aterrimus*.

1.3 Leigh Mill Pond

Leigh Mill Pond had the second richest community of the three ponds surveyed. The numerically dominant species at the site was the water slater, *Asellus aquaticus*. The small, predatory, lesser water-boatman, *Cymatia coleoptrata* was unusually common in the stands of Nuttall's waterweed (*Elodea nuttallii*) and rigid hornwort (*Ceratophyllum demersum*). The saucer bug, *Ilyocoris cimicoides* was very common in marginal vegetation on the north bank.

Of the habitats available for macroinvertebrates at the site, the richest appeared to be the stands of branched bur-reed (*Sparganium erectum*) and the grassy margins of the north bank. The stands of Nuttall's waterweed and rigid hornwort were also relatively rich and supported several species of water bug. The large vegetation raft at the eastern end of the pond appeared to support very few aquatic macroinvertebrate species.

A2. AQUATIC MACROINVERTEBRATES RECORDED IN THE GODSTONE PONDS

SPECIES	Bay Pond TQ 353516	Leigh Place TQ 360509	Leigh Mill TQ 362509
TRICLADIDA (Flatworms)			
Dendrocoelum lacteum	+	+	+
Dugesia polychroa	+	+	-
Dugesia tigrina	+	-	+
HIRUDINEA (Leeches)			
Erpobdella octoculata	+	-	+
Glossiphonia complanata	+	-	+
Glossiphonia heteroclita	+	-	-
Helobdella stagnalis	+	+	+
Piscicola geometra	+	-	+
Theromyzon tessulatum	-	-	+
GASTROPODA (Snails and limpets)			
Acroloxus lacustris	+	-	-
Anisus vortex	+	+	-
Armiger crista	+	-	+
Bathyomphalus contortus	+	-	+
Bithynia leachi	+	-	-
Bithynia tentaculata	+	+	+
Gyraulus albus	+	-	+
Hippeutis complanatus	+	-	+
Lymnaea palustris	+	+	+
Lymnaea peregra	+	+	+
Lymnaea stagnalis	+	-	+
Planorbis carinatus	-	+	+
Potamopyrgus jenkinsi	+	-	-
Valvata cristata	-	+	-
Valvata piscinalis	-	+	-
UNIONIDAE (Large bivalves)			
Anodonta cygnaea	+	-	-
MALACOSTRACA (Shrimps and slaters)			
Asellus aquaticus	+	+	+
Crangonyx pseudogracilis	+	+	+
Gammarus pulex	+	-	-
EPHEMEROPTERA (Mayflies)			
Caenis horaria	-	+	-
Cloeon dipterum	+	+	+

SPECIES	Bay Pond TQ 353516	Leigh Place TQ 360509	Leigh Mill TQ 362509
ODONATA (Dragonflies and damselflies)			
Coenagrion puella/pulchellum	-	-	+
Ischnura elegans	+	+	-
Pyrrhosoma nymphula	+	-	-
MEGALOPTERA (Alder-flies)			
Sialis lutaria	+	+	+
HETEROPTERA (Bugs)			
Callicorixa praeusta	+	-	-
Corixa punctata	+	-	+
Cymatia coleoptrata	-	-	+
Hydrometra stagnorum	-	+	+
Ilyocoris cimicoides	+	+	+
Nepa cinerea	+	-	-
Notonecta glauca	+	+	+
Notonecta maculata	-	+	-
Notonecta marmorea	-	-	+
Ranatra linearis	+	-	-
Sigara dorsalis	+	+	-
Sigara falleni	+	+	-
Velia caprai	-	+	-
TRICHOPTERA (Caddis-flies)			
Athripsodes aterrimus	-	+	-
Cyrnus trimaculatus	+	-	-
Glyphotaelius pellucidus	+	-	-
COLEOPTERA (Beetles)			
Agabus paludosus	+	-	-
Agabus sturmii	+	-	-
Anacaena limbata	+	-	-
Haliplus immaculatus	-	-	+
Hydroporus palustris	+	-	+
Hygrobia hermanni	+	-	-
Hygrotus inaequalis	+	-	-
Hyphydrus ovatus	-	-	+
Ilybius fenestratus	-	-	+
Laccobius bipunctatus	+	-	-
Laccobius minutus	+	-	-
Laccophilus hyalinus	+	-	-
Laccophilus minutus	+	-	-
Noterus clavicornis	+	-	+

A3. LOCAL AQUATIC MACROINVERTEBRATES RECORDED IN THE GODSTONE PONDS

Glossiphonia heteroclita HIRUDINEA: GLOSSIPHONIIDAE

A leech. Widespread but not common in the British Isles. Mainly found in lakes and ponds, though occasionally found in slow flowing rivers. (Elliott. and Tullet, 1982).

Bithynia leach GASTROPODA:HYDROBIIDAE

Leach's Bithynia. Confined to south-east England. Locally common in slow flowing rivers and large water bodies. (J.Bratton, pers. comm.).

Ranatra linearis HETEROPTERA :NEPIDAE

The Water Stick Insect. Locally common in the south east of England. A species of large water bodies and, occasionally, slow flowing rivers. (J.Bratton, pers. comm.).

Hygrobia hermanni HYGROBIIDAE: COLEOPTERA

The Screech Beetle. Locally common in the south east of England in a variety of habitats. (Nationally Notable B, J.Bratton, pers. comm.).