

FRESHWATER BIOLOGICAL ASSOCIATION

The Ferry House, Far Sawrey, Ambleside, Cumbria, LA22 0LP

Invertebrates of Esthwaite in relation to development of fish farming in the South Basin.

by

L.C.V.Pinder

**ESTHWAITE
INVERTEBRATE SAMPLES
NCC contract HF 3-03-208(87)**

FBA Nominated Officer:	Dr L.C.V. Pinder
NCC Nominated Officer:	Dr P.J. Boon
Report Date:	March 1988
Report to:	Nature Conservancy Council

This is an unpublished report and should not be cited without permission .

The Freshwater Biological Association is part of the Terrestrial and Freshwater Sciences Directorate of the Natural Environment Research Council

ARRANGEMENT OF CONTENTS

1	EXPLANATORY NOTES				
2	LIST OF RECORDED TAXA				
3	SOUTH BASIN	AUGUST	1980	}	OLIGOCHAETES
				}	DIPTERA
4	"	MAY	1981	}	OLIGOCHAETES
				}	DIPTERA
5	"	OCTOBER	1981	}	OLIGOCHAETES
				}	DIPTERA
6	"	FEBRUARY	1982	}	OLIGOCHAETES
				}	DIPTERA
7	"	MAY	1984	}	OLIGOCHAETES
				}	DIPTERA
8	"	JULY	1987	}	OLIGOCHAETES
				}	DIPTERA
9	NORTH BASIN	AUGUST	1980	}	OLIGOCHAETES
				}	DIPTERA
10	"	MAY	1981	}	OLIGOCHAETES
				}	DIPTERA
11	"	OCTOBER	1981	}	OLIGOCHAETES
				}	DIPTERA
12	"	FEBRUARY	1982	}	OLIGOCHAETES
				}	DIPTERA
13	"	MAY	1984	}	OLIGOCHAETES
				}	DIPTERA
14	"	JULY	1987	}	OLIGOCHAETES
				}	DIPTERA
15	SOUTH BASIN	TOTAL OLIGOCHAETES FOR EACH DATE			
	"	"	DIPTERA	"	"
16	NORTH BASIN	TOTAL OLIGOCHAETES FOR EACH DATE			
	"	"	DIPTERA	"	"
17	MISCELLANEOUS INVERTEBRATES OCCURRING IN SMALL NUMBERS.				

ESTHWAITE SAMPLES

EXPLANATORY NOTES

Samples were provided from two areas of Esthwaite. Series SD/SS was taken from the South Basin, while the second series, ND, was taken from the North Basin. Prefix SD indicates "South Basin, Deeps" (i.e. > 5m), SS indicates "South Basin, Shallows" (i.e. < 5m) and ND indicates North Basin, Deeps. Precise sampling sites are indicated by a number, which corresponds with one of the numbered sampling locations indicated on Figure 1, where Deeps are shown by green transect lines and Shallows by red transect lines.

Sediment cores were obtained using a Jenkin sediment sampler (Ohnstad & Jones, 1982). The cores were 7 cm diameter and the upper 4 cm depth of sediment was extruded immediately upon collection and put into a jar containing 17 ml 6% formaldehyde solution. These cores represent the complete core material from 1984 & 1987 from which invertebrates were counted. Cores collected during 1980, 1981 and 1982 were first used to count cysts of dinoflagellates. In this work each extruded core was diluted to a volume of 768 ml with formaldehyde, glycerol and water and well mixed. One third of this well mixed sediment suspension was retained and used for invertebrate counts. The effective area of these samples is thus only 1/3 that of the later samples. Macroinvertebrates were removed after washing the samples through a sieve of 125µm aperture.

The great majority of Oligochaetes were immature rendering specific, and even generic identification frequently impossible. Most are therefore classified as Tubificidae with (+) or without (-) hair chaetae. Those with hair chaetae include *Aulodrilus plurisetus* and also probably *Tubifex tubifex* and *Potamothrix hammoniensis*. On the basis of the earlier work carried out by Reynoldson (1983) those without hair chaetae are likely to be predominantly *Limnodrilus hoffmeisteri*.

Two species of Oligochaete are worthy of particular mention since they are relatively infrequently recorded. *Spercaria josinae* was recorded by Brinkhurst (1963) only from Esthwaite. The FBA River Communities survey has identified this species from only 7 of the 438 sites for which data have been obtained. *Slavina appendiculata* is rather more common having been obtained from 30 of the 438 sites.

The other common group of invertebrates in Esthwaite is the Chironomidae. Most are identifiable only to genus in the absence of any reared material. All of the *Chironomus* larvae belong to the "thummi" group, i.e. they lack lateral tubules on the abdomen. Their specific identity is not possible to determine with confidence. They may well be *Chironomus anthracinus* but it is quite likely that *Chironomus riparius* is also represented especially in samples from the shallower regions.

Sphaeriidae were commonly found but because of the extent to which they had become decalcified could not be identified further.

References.

Brinkhurst, R.O. (1963). A Guide for the Identification of British Aquatic Oligochaeta. *Scient Publ Freshwat. biol. Ass.* 22, 52pp.

Ohnstad, F.R. & Jones, J.G. (1982) The Jenkin surface mud sampler user manual. *Occ. Publ. Freshwat. biol. Ass.* 15, 45p.

Reynoldson, T.B (1983). The population dynamics of aquatic Oligochaeta in the English Lake District. *Ph.D. Thesis, University of Lancaster.*

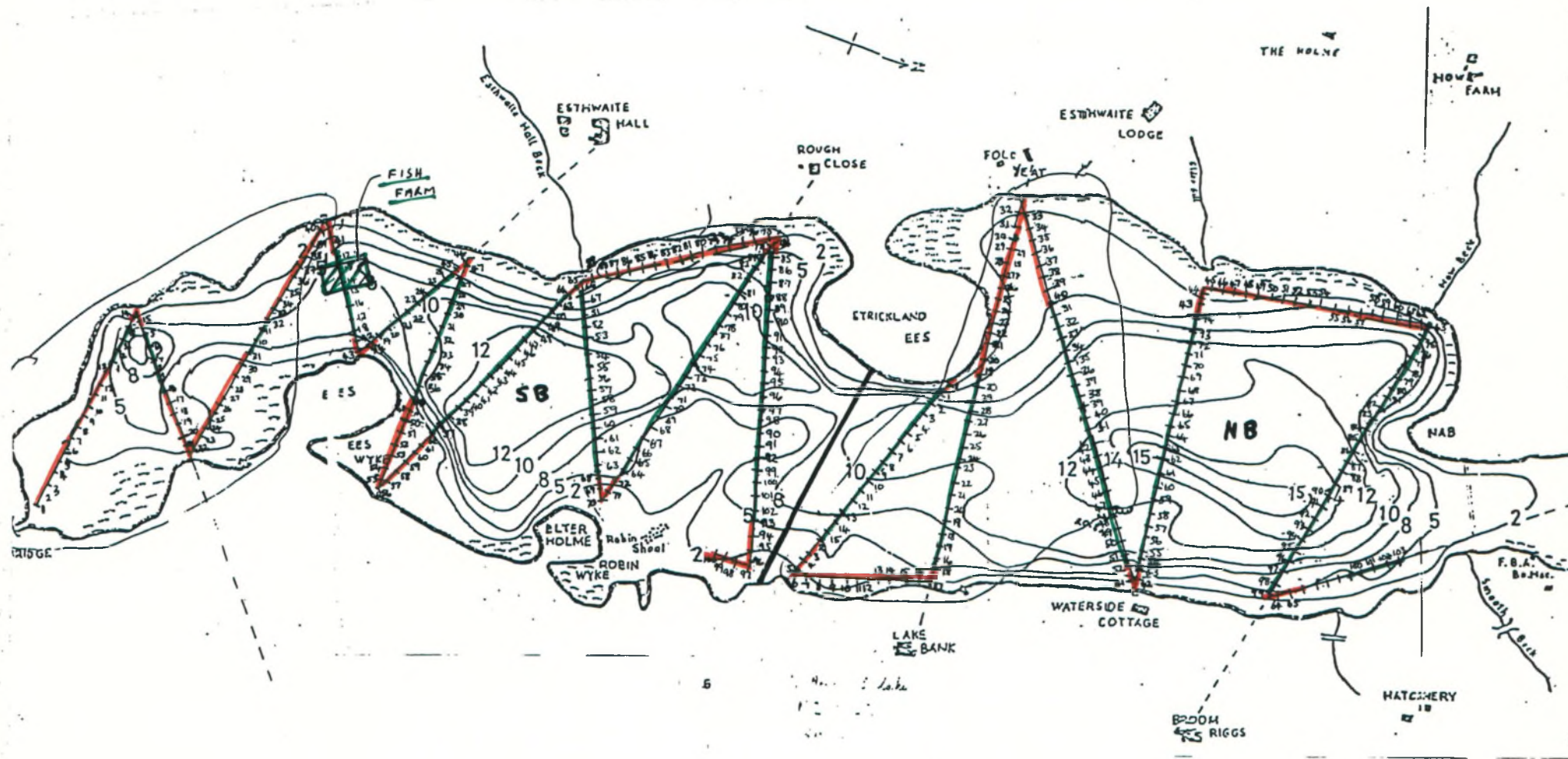


FIGURE 1

ESTHWAITE WATER

DEPTH CONTOURS IN METRES

— SHALLS
— DEEPS

0 25 50 m.

Acknowledgements

The samples for this study were provided by Dr S.I. Heaney. The considerable assistance of Mr J.A.B. Bass with sorting and identification of the material is gratefully acknowledged and thanks are due also to Dr M. Ladle for his advice and help with identification of the Oligochaeta.

INVERTEBRATES RECORDED FROM ESTHWAITE

(* = present)

	SOUTH BASIN	NORTH BASIN
MOLLUSCA		
<i>Valvata piscinalis</i> (Muller)	*	
SPHAERIIDAE	*	
OLIGOCHAETA		
<i>Chaetogaster ?diaphanus</i> (Gruithuisen)	*	
<i>Dero digitata</i> (Muller)	*	*
<i>Slavina appendiculata</i> (Udekem)	*	*
<i>Nais variabilis</i> Piguet	*	*
<i>Nais communis</i> Piguet	*	
<i>Nais elinguis</i> Muller	*	
<i>Ophidonais serpentina</i> (Muller)	*	
<i>Pristina idrensis</i> Sperber	*	
<i>Stylaria lacustris</i> (L.)	*	
<i>Spercaria josinae</i> (Vejdovsky)	*	*
TUBIFICIDAE (+ hair chaetae)	*	*
<i>Aulodrilus pluriseta</i> (Piguet)	*	*
TUBIFICIDAE (- hair chaetae)	*	*
<i>Limnodrilus claparedeanus</i> Ratzel	*	
<i>Limnodrilus hoffmeisteri</i> Claparede	*	
<i>Limnodrilus</i> sp.	*	*
LUMBRICULIDAE	*	*
HIRUDINEA		
<i>Helobdella stagnalis</i> (L.)	*	*
MALACOSTRACA		
<i>Asellus aquaticus</i> (L.)	*	*
EPHEMEROPTERA		
<i>Caenis horaria</i> (L.)	*	*
ODONATA		
ZYGOPTERA		
MEGALOPTERA		
<i>Sialis lutaria</i> (L.)	*	
DIPTERA		
<i>Procladius choreus</i> (Meigen)	*	*
<i>Chironomus (thummi)</i> gp)	*	*
<i>Dicrotendipes</i> sp.	*	
<i>Einfeldia</i> sp.	*	
<i>Endochironomus</i> sp.	*	
<i>Glyptotendipes</i> sp.	*	
<i>Microtendipes</i> sp.	*	
<i>Pagastiella orophila</i> (Edwards)	*	*
<i>Paratendipes albimanus</i> (Meigen)	*	*
<i>Polypedilum</i> sp.	*	*
<i>Cladotanytarsus</i> sp.	*	
<i>Micropsectra</i> sp.	*	
<i>Stempellinella</i> sp.	*	
<i>Tanytarsus</i> sp.	*	*
<i>Chaoborus</i> sp.	*	*

SAMPLE DATE: AUGUST, 1980 SAMPLE SERIES: SD/SS

CORE NUMBER: SS16 SS22 SS23 SS24 SS25 SS33 SS37 SS50 SS51 SS91

Chaetogaster
?diaphanus

Dero
digitata

Slavina
appendiculata

Nais
variabilis

Nais
?communis

Nais
elinguis

Ophidonais
serpentina

Pristina
idrensis

Stylaria
lacustris

Spercaria 1 2
josinae

TUBIFICIDAE 1 2 5 1
(+ hair setae)

Aulodrilus 1 3 1 1 5 3 3
pluriseta

TUBIFICIDAE
(- hair setae)

Limnodrilus
claparedeanus

Limnodrilus
hoffmeisteri

Limnodrilus
SP.

LUMBRICULIDAE

TOTALS 2 5 6 1 7 0 2 3 3 0

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: AUGUST, 1980

SAMPLE SERIES: SD/SS

CORE NUMBER: SS16 SS22 SS23 SS24 SS25 SD33 SD37 SD50 SD51 SD91

<i>Procladius choreus</i>	3	4		7	1					
<i>Chironomus thummi</i> gp	1	1		3						
<i>Dicrotendipes</i> sp.				1						
<i>Einfeldia</i> sp.										
<i>Endochironomus</i> sp.										
<i>Glyptotendipes</i> sp.	1									
<i>Microtendipes</i> sp.										
<i>Pagastiella orophila</i>				1						
<i>Paratendipes albimanus</i>										
<i>Polypedilum</i> sp.									1	
<i>Cladotanytarsus</i> sp.				1						
<i>Micropsectra</i> sp.										
<i>Stempellinella</i> sp.										
<i>Tanytarsus</i> sp.		1		1		1				
<i>Chaoborus</i> sp.		3		1						
TOTALS	1	4	9	0	15	1	1	0	0	1

SAMPLE DATE: MAY, 1981

SAMPLE SERIES: SD/SS

CORE NUMBER: SD01 SD06 SD17 SD18 SD19 SD27 SD30 SD33 SD36 SD39

Chaetogaster
?diaphanus

Dero
digitata

Slavina
appendiculata

Nais
variabilis

Nais
?communis

Nais
elinguis

Ophidonais
serpentina

Pristina
idrensis

Stylaria
lacustris

Spercaria 3 1 1
josinae

TUBIFICIDAE
(+ hair setae) 4 2 3 7 2 2

Aulodrilus 8 6 13 1 1
pluriseta

TUBIFICIDAE 2
(- hair setae)

Limnodrilus
claparedeanus

Limnodrilus
hoffmeisteri

Limnodrilus
sp.

LUMBRICULIDAE

TOTALS 11 1 10 13 5 1 4 7 2 2

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: MAY, 1981

SAMPLE SERIES: SD/SS

CORE NUMBER: SD01 SD06 SD17 SD18 SD19 SD27 SD30 SD33 SD36 SD39

<i>Procladius choreus</i>	6	2	6	1	3	2	3			
<i>Chironomus thummi</i> gp	1	2								
<i>Dicrotendipes</i> sp.										
<i>Einfeldia</i> sp.	1			1						
<i>Endochironomus</i> sp.										
<i>Glyptotendipes</i> sp.										
<i>Microtendipes</i> sp.										
<i>Pagastiella orophila</i>										
<i>Paratendipes albimanus</i>										
<i>Polypedilum</i> sp.										
<i>Cladotanytarsus</i> sp.	2	2		2						
<i>Micropsectra</i> sp.										
<i>Stempellinella</i> sp.	3						1			
<i>Tanytarsus</i> sp.										1
<i>Chaoborus</i> sp.								1	1	
TOTALS	13	6	6	4	3	3	3	0	1	2

SAMPLE DATE: OCTOBER, 1981

SAMPLE SERIES: SD/SS

CORE NUMBER: SD10 SD15 SD22 SD31 SD34 SS17 SS25 SS30 SS32 SS38

Chaetogaster
?diaphanus

Dero
digitata

Slavina
appendiculata

Nais
variabilis

Nais
?communis

Nais
elinguis

Ophidonais
serpentina

Pristina
idrensis

Stylaria
lacustris

Spercaria 1
josinae

TUBIFICIDAE 2 1 4 8 1 2 1
(+ hair setae)

Aulodrilus 1 1 2
pluriseta

TUBIFICIDAE 3 15
(- hair setae)

Limnodrilus
claparedeanus

Limnodrilus
hoffmeisteri

Limnodrilus 1
sp.

LUMBRICULIDAE

TOTALS 3 1 0 7 23 2 6 0 1 0

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: OCTOBER, 1981

SAMPLE SERIES: SD/SS

CORE NUMBER: SD10 SD15 SD22 SD31 SD34 SS17 SS25 SS30 SS32 SS38

<i>Procladius choreus</i>						2	5	5	9	3
<i>Chironomus thummi</i> gp										
<i>Dicrotendipes</i> sp.									2	
<i>Einfeldia</i> sp.										
<i>Endochironomus</i> sp.										
<i>Glyptotendipes</i> sp.								3	6	
<i>Microtendipes</i> sp.										
<i>Pagastiella orophila</i>										
<i>Paratendipes albimanus</i>										
<i>Polypedilum</i> sp.										
<i>Cladotanytarsus</i> sp.							1			
<i>Micropsectra</i> sp.										
<i>Stempellinella</i> sp.										
<i>Tanytarsus</i> sp.							4	3	3	
<i>Chaoborus</i> sp.										
TOTALS	0	0	0	0	0	2	10	11	20	3

SAMPLE DATE: FEB., 1982

SAMPLE SERIES: SD/SS

CORE NUMBER: SD19 SD23 SD33 SS11 SS13 SS26 SS30 SS32 SS34 SS38

Chaetogaster
?diaphanus

Dero
digitata

Slavina
appendiculata

Nais
variabilis

Nais
?communis

Nais
elinguis

Ophidonais
serpentina

Pristina 1
idrensis

Stylaria
lacustris

Spercaria 1 6 1
josinae

TUBIFICIDAE 7 3 17 2 4 21 20 5 6
(+ hair setae)

Aulodrilus 30 18 4 2 7
pluriseta

TUBIFICIDAE 21 3 7
(- hair setae)

Limnodrilus
claparedeanus

Limnodrilus 1 1
hoffmeisteri

Limnodrilus 1 5
sp.

LUMBRICULIDAE

TOTALS 7 4 44 34 18 8 24 36 5 14

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: FEB., 1982

SAMPLE SERIES: SD/SS

CORE NUMBER: SD19 SD23 SD33 SS11 SS13 SS26 SS30 SS32 SS34 SS38

<i>Procladius choreus</i>	12	2	1	5	5	10	14	5	5	4
<i>Chironomus thummi</i> gp				1						1
<i>Dicrotendipes</i> sp.										
<i>Einfeldia</i> sp.										
<i>Endochironomus</i> sp.										
<i>Glyptotendipes</i> sp.										
<i>Microtendipes</i> sp.										
<i>Pagastiella orophila</i>										
<i>Paratendipes albimanus</i>										
<i>Polypedilum</i> sp.										
<i>Cladotanytarsus</i> sp.										
<i>Micropsectra</i> sp.				1	1					
<i>Stempellinella</i> sp.										
<i>Tanytarsus</i> sp.	2			2		2	1			10
<i>Chaoborus</i> sp.										
TOTALS	14	2	1	9	6	12	15	5	5	15

SAMPLE DATE: MAY, 1984 SAMPLE SERIES: SD/SS

CORE NUMBER: SD11 SD12 SD26 SD29 SD47 SS09 SS21 SS23 SS25 SS47

Chaetogaster
?diaphanus

Dero 1
digitata

Slavina 1
appendiculata

Nais 1
variabilis

Nais 10
?communis

Nais 1
elinguis

Ophidonais 2
serpentina

Pristina
idrensis

Stylaria 1
lacustris

Spercaria 2 2 2
josinae

TUBIFICIDAE 22 1 15 11 37 1 32 6
(+ hair setae)

Aulodrilus 2
pluriseta

TUBIFICIDAE 3 3
(- hair setae)

Limnodrilus
claparedeanus

Limnodrilus
hoffmeisteri

Limnodrilus
sp.

LUMBRICULIDAE 1

TOTALS 24 1 22 14 40 0 0 14 36 6

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: MAY, 1984

SAMPLE SERIES: SD/SS

CORE NUMBER: SD11 SD12 SD26 SD29 SD47 SS09 SS21 SS23 SS25 SS47

<i>Procladius choreus</i>	8	2	1		2	20	10	25	5	9
<i>Chironomus thummi</i> gp			1	7				2	1	
<i>Dicrotendipes</i> sp.							2			
<i>Einfeldia</i> sp.										
<i>Endochironomus</i> sp.						3				
<i>Glyptotendipes</i> sp.										
<i>Microtendipes</i> sp.										
<i>Pagastiella orophila</i>										
<i>Paratendipes albimanus</i>				2						
<i>Polypedilum</i> sp.										
<i>Cladotanytarsus</i> sp.										
<i>Micropsectra</i> sp.										
<i>Stempellinella</i> sp.										
<i>Tanytarsus</i> sp.		1				2	2	3		
<i>Chaoborus</i> sp.			1	4	4					
TOTALS	8	3	3	13	6	25	14	30	6	9

SAMPLE DATE: JULY, 1987 SAMPLE SERIES: SD/SS

CORE NUMBER: SD07 SD18 SD22 SD28 SD33 SS22 SS24 SS26 SS29 SS40

Chaetogaster 6
?diaphanus

Dero 2
digitata

Slavina
appendiculata

Nais
variabilis

Nais
?communis

Nais 1
elinguis

Ophidonais
serpentina

Pristina
idrensis

Stylaria
lacustris

Spercaria 3 1
josinae

TUBIFICIDAE 1 78 3 33 2
(+ hair setae)

Aulodrilus 2 1 1 1
pluriseta

TUBIFICIDAE 18
(- hair setae)

Limnodrilus 2
claparedeanus

Limnodrilus 16 9
hoffmeisteri

Limnodrilus
sp.

LUMBRICULIDAE

TOTALS 0 2 104 12 54 4 1 1 2 0

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: JULY, 1987

SAMPLE SERIES: SD/SS

CORE NUMBER: SD07 SD18 SD22 SD28 SD33 SS22 SS24 SS26 SS29 SS40

<i>Procladius choreus</i>	6	2			3	2	2			
<i>Chironomus thummi</i> gp		6	3	17	17	1				
<i>Dicrotendipes</i> sp.							1	1		
<i>Einfeldia</i> sp.						9				
<i>Endochironomus</i> sp.							1	1		
<i>Glyptotendipes</i> sp.										
<i>Microtendipes</i> sp.	1							4	1	
<i>Pagastiella orophila</i>										
<i>Paratendipes albimanus</i>										
<i>Polypedilum</i> sp.										
<i>Cladotanytarsus</i> sp.										
<i>Micropsectra</i> sp.										
<i>Stempellinella</i> sp.										
<i>Tanytarsus</i> sp.	12	1				5	3	10		
<i>Chaoborus</i> sp.	2			1						
TOTALS	2	19	7	5	18	17	18	7	18	1

SAMPLE DATE: AUGUST, 1980 SAMPLE SERIES: ND

CORE NUMBER: ND36 ND41 ND47 ND60 ND60 ND63 ND64 ND65 ND66 ND69

Chaetogaster
?diaphanus

Dero
digitata

Slavina
appendiculata

Nais
variabilis

Nais
?communis

Nais
elinguis

Ophidonais
serpentina

Pristina
idrensis

Stylaria
lacustris

Spercaria
josinae

TUBIFICIDAE 18 18 13 5 10 28 15 15 10
(+ hair setae)

Aulodrilus
pluriseta

TUBIFICIDAE
(- hair setae)

Limnodrilus
claparedeanus

Limnodrilus
hoffmeisteri

Limnodrilus 10 2 2 13
sp.

LUMBRICULIDAE 2 5 15 28 10 8 13

TOTALS 28 20 13 0 12 27 69 25 23 23

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: AUGUST, 1980

SAMPLE SERIES: ND

CORE NUMBER: ND36 ND41 ND47 ND60 ND62 ND63 ND64 ND65 ND66 ND69

Procladius
choreus

Chironomus 1
thummi gp

Dicrotendipes
sp.

Einfeldia
sp.

Endochironomus
sp.

Glyptotendipes
sp.

Microtendipes
sp.

Pagastiella
orophila

Paratendipes
albimanus

Polypedilum
sp.

Cladotanytarsus
sp.

Micropsectra
sp.

Stempellinella
sp.

Tanytarsus
sp.

Chaoborus 2 2
sp.

TOTALS 1 0 0 2 2 0 0 0 0 0

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208 (87) OLIGOCHAETES

SAMPLE DATE: MAY, 1981 SAMPLE SERIES: ND

CORE NUMBER: ND48 ND51 ND55 ND57 ND59 ND61 ND89 ND93 ND98 ND99

Chaetogaster
?diaphanus

Dero
digitata

Slavina 1
appendiculata

Nais
variabilis

Nais
?communis

Nais
elinguis

Ophidonais
serpentina

Pristina
idrensis

Stylaria
lacustris

Spercaria 2
josinae

TUBIFICIDAE 2 2 2 2 7 5 7 12 2
(+ hair setae)

Aulodrilus 3 3
pluriseta

TUBIFICIDAE 1 1 1 4 3
(- hair setae)

Limnodrilus
claparedeanus

Limnodrilus
hoffmeisteri

Limnodrilus 1
SP.

LUMBRICULIDAE 1 1

TOTALS 3 6 2 4 7 5 11 17 5 3

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: MAY,1981

SAMPLE SERIES: ND

CORE NUMBER: ND48 ND51 ND55 ND57 ND59 ND61 ND89 ND93 ND98 ND99

<i>Procladius choreus</i>	7	2	1	1	1	4	1	4		
<i>Chironomus thummi</i> gp	2	2			1	5				
<i>Dicrotendipes</i> sp.										
<i>Einfeldia</i> sp.										
<i>Endochironomus</i> sp.										
<i>Glyptotendipes</i> sp.										
<i>Microtendipes</i> sp.										
<i>Pagastiella orophila</i>									1	
<i>Paratendipes albimanus</i>						4				
<i>Polypedilum</i> sp.										
<i>Cladotanytarsus</i> sp.										
<i>Micropsectra</i> sp.										
<i>Stempellinella</i> sp.										
<i>Tanytarsus</i> sp.	1							1		
<i>Chaoborus</i> sp.			7		1	1	1			
TOTALS	2	8	4	8	1	3	14	2	5	1

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208 (87) OLIGOCHAETES

SAMPLE DATE: OCTOBER, 1981 SAMPLE SERIES: ND

CORE NUMBER: ND37 ND44 ND47 ND48 ND57 ND60 ND63 ND64 ND66 ND70

Chaetogaster
?diaphanus

Dero
digitata

Slavina
appendiculata

Nais
variabilis

Nais
?communis

Nais
elinguis

Ophidonais
serpentina

Pristina
idrensis

Stylaria
lacustris

Spercaria 2
josinae

TUBIFICIDAE 5 9 11 2 11 30 14 65 32 9
(+ hair setae)

Aulodrilus 7
pluriseta

TUBIFICIDAE 2 9 2 7 5 2
(- hair setae)

Limnodrilus
claparedeanus

Limnodrilus
hoffmeisteri

Limnodrilus
sp.

LUMBRICULIDAE

TOTALS 7 9 20 4 20 35 16 65 32 16

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: OCTOBER, 1981 SAMPLE SERIES: ND

CORE NUMBER: ND37 ND44 ND47 ND48 ND57 ND60 ND63 ND64 ND66 ND70

<i>Procladius choreus</i>	2	1		2						2
<i>Chironomus thummi</i> gp	1		1							
<i>Dicrotendipes</i> sp.										
<i>Einfeldia</i> sp.										
<i>Endochironomus</i> sp.										
<i>Glyptotendipes</i> sp.										
<i>Microtendipes</i> sp.										
<i>Pagastiella orophila</i>										
<i>Paratendipes albimanus</i>										
<i>Polypedilum</i> sp.										
<i>Cladotanytarsus</i> sp.										
<i>Micropsectra</i> sp.										
<i>Stempellinella</i> sp.										
<i>Tanytarsus</i> sp.		1								
<i>Chaoborus</i> sp.			1						1	
TOTALS	3	3	1	2	0	0	0	0	1	2

SAMPLE DATE: FEB., 1982

SAMPLE SERIES: ND

CORE NUMBER: ND41 ND44 ND47 ND49 ND58 ND59 ND60 ND62 ND66 ND68

Chaetogaster
?diaphanus

Dero
digitata

Slavina
appendiculata

Nais
variabilis

Nais
?communis

Nais
elinguis

Ophidonais
serpentina

Pristina
idrensis

Stylaria
lacustris

Spercaria
josinae

TUBIFICIDAE (+ hair setae) 9 9 17 17 6 3 23 58 35 3

Aulodrilus plurisetus 3 6 3

TUBIFICIDAE (- hair setae) 3 14 35 3 20

Limnodrilus
claparedeanus

Limnodrilus
hoffmeisteri

Limnodrilus
sp.

LUMBRICULIDAE

TOTALS 9 12 31 52 9 3 23 64 38 26

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: FEB., 1982

SAMPLE SERIES: ND

CORE NUMBER: ND41 ND44 ND47 ND49 ND58 ND59 ND60 ND62 ND66 ND68

<i>Procladius choreus</i>	1	2	2	5	1	3		1		
<i>Chironomus thummi</i> gp		4	13	1	1	1	1	1	1	
<i>Dicrotendipes</i> sp.										
<i>Einfeldia</i> sp.										
<i>Endochironomus</i> sp.										
<i>Glyptotendipes</i> sp.										
<i>Microtendipes</i> sp.										
<i>Pagastiella orophila</i>										
<i>Paratendipes albimanus</i>										
<i>Polypedilum</i> sp.										
<i>Cladotanytarsus</i> sp.										
<i>Micropsectra</i> sp.										
<i>Stempellinella</i> sp.										
<i>Tanytarsus</i> sp.				1						
<i>Chaoborus</i> sp.		1			2	3	4	1		
TOTALS	1	7	15	7	4	7	5	3	1	0

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208 (87) OLIGOCHAETES

SAMPLE DATE: MAY, 1984 SAMPLE SERIES: ND

CORE NUMBER: ND36 ND41 ND53 ND60 ND63 ND65 ND69 ND81 ND84 ND96

Chaetogaster
?diaphanus

Dero 3
digitata

Slavina
appendiculata

Nais
variabilis

Nais
?communis

Nais
elinguis

Ophidonais
serpentina

Pristina
idrensis

Stylaria
lacustris

Spercaria 10 17 2
josinae

TUBIFICIDAE 40 27 10 10 13 57 54 13 1 10
(+ hair setae)

Aulodrilus
pluriseta

TUBIFICIDAE 17 3 30 3 3 4 17
(- hair setae)

Limnodrilus
claparedeanus

Limnodrilus
hoffmeisteri

Limnodrilus
sp.

LUMBRICULIDAE

TOTALS 70 27 10 10 16 87 74 16 7 27

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: MAY, 1984

SAMPLE SERIES: ND

CORE NUMBER: ND36 ND41 ND53 ND60 ND63 ND65 ND69 ND81 ND84 ND96

<i>Procladius</i> <i>choreus</i>	1		1		1	6	19	2
-------------------------------------	---	--	---	--	---	---	----	---

<i>Chironomus</i> <i>thummi</i> gp	1		1					
---------------------------------------	---	--	---	--	--	--	--	--

<i>Dicrotendipes</i> sp.								
-----------------------------	--	--	--	--	--	--	--	--

<i>Einfeldia</i> sp.								
-------------------------	--	--	--	--	--	--	--	--

<i>Endochironomus</i> sp.								
------------------------------	--	--	--	--	--	--	--	--

<i>Glyptotendipes</i> sp.								
------------------------------	--	--	--	--	--	--	--	--

<i>Microtendipes</i> sp.								
-----------------------------	--	--	--	--	--	--	--	--

<i>Pagastiella</i> <i>orophila</i>								
---------------------------------------	--	--	--	--	--	--	--	--

<i>Paratendipes</i> <i>albimanus</i>								
-----------------------------------------	--	--	--	--	--	--	--	--

<i>Polypedilum</i> sp.							1	
---------------------------	--	--	--	--	--	--	---	--

<i>Cladotanytarsus</i> sp.								
-------------------------------	--	--	--	--	--	--	--	--

<i>Micropsectra</i> sp.								
----------------------------	--	--	--	--	--	--	--	--

<i>Stempellinella</i> sp.								
------------------------------	--	--	--	--	--	--	--	--

<i>Tanytarsus</i> sp.						1		
--------------------------	--	--	--	--	--	---	--	--

<i>Chaoborus</i> sp.		8		6	1	1		1
-------------------------	--	---	--	---	---	---	--	---

TOTALS	2	8	0	2	6	1	3	6	20	3
--------	---	---	---	---	---	---	---	---	----	---

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208 (87) OLIGOCHAETES

SAMPLE DATE: JULY, 1987 SAMPLE SERIES: ND

CORE NUMBER: ND40 ND47 ND54 ND55 ND62 ND63 ND64 ND66 ND69 ND92

Chaetogaster
?diaphanus

Dero
digitata

Slavina
appendiculata

Nais 4
variabilis

Nais
?communis

Nais
elinguis

Ophidonais
serpentina

Pristina
idrensis

Stylaria
lacustris

Spercaria 4
josinae

TUBIFICIDAE
(+ hair setae) 62 4 40 22 22 44 84 44

Aulodrilus
pluriseta 1

TUBIFICIDAE 18 9
(- hair setae)

Limnodrilus
claparedeanus

Limnodrilus
hoffmeisteri

Limnodrilus
sp.

LUMBRICULIDAE

TOTALS 0 80 9 0 49 22 26 44 84 44

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87) DIPTERA

SAMPLE DATE: JULY, 1987

SAMPLE SERIES: ND

CORE NUMBER: ND40 ND47 ND54 ND55 ND62 ND63 ND64 ND66 ND69 ND92

<i>Procladius choreus</i>		11	3						2	

<i>Chironomus thummi</i> gp			17	2		1		2	1	

<i>Dicrotendipes</i> sp.										

<i>Einfeldia</i> sp.										

<i>Endochironomus</i> sp.										

<i>Glyptotendipes</i> sp.										

<i>Microtendipes</i> sp.										

<i>Pagastiella orophila</i>										

<i>Paratendipes albimanus</i>										

<i>Polypedilum</i> sp.										

<i>Cladotanytarsus</i> sp.										

<i>Micropsectra</i> sp.										

<i>Stempellinella</i> sp.										

<i>Tanytarsus</i> sp.			3							

<i>Chaoborus</i> sp.	1	1	3		1	1	3	1	2	1

TOTALS	1	1	17	20	3	1	4	1	4	4

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208 (87)

TOTAL OLIGOCHAETES PER SAMPLE FOR EACH DATE. SAMPLE SERIES:SD/SS

DATE: AUG,80 MAY,81 OCT,81 FEB,82 MAY,84 JUL,87

Chaetogaster ?diaphanus						6
Dero digitata					1	2
Slavina appendiculata					1	
Nais variabilis					1	
Nais ?communis					10	
Nais elinguis					1	1
Ophidonais serpentina					2	
Pristina idrensis				1		
Stylaria lacustris					1	
Spercaria josinae	3	5	1	8	6	4
TUBIFICIDAE (+ hair setae)	9	20	19	85	125	117
Aulodrilus pluriseta	17	29	4	61	2	5
TUBIFICIDAE (- hair setae)		2	18	31	6	18
Limnodrilus claparedeanus						2
Limnodrilus hoffmeisteri				2		25
Limnodrilus sp.			1	6		
LUMBRICULIDAE					1	
TOTALS	29	56	43	194	157	180

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87)

TOTAL DIPTERA PER SAMPLE FOR EACH DATE. SAMPLE SERIES: SD/SS

DATE: AUG,80 MAY,81 OCT,81 FEB,82 MAY,84 JUL,87

<i>Procladius choreus</i>	15	23	24	63	82	15
<i>Chironomus thummi</i> gp	5	3		2	11	44
<i>Dicrotendipes</i> sp.	1		2		2	2
<i>Einfeldia</i> sp.		2				9
<i>Endochironomus</i> sp.					3	2
<i>Glyptotendipes</i> sp.	1		9			
<i>Microtendipes</i> sp.						6
<i>Pagastiella orophila</i>	1					
<i>Paratendipes albimanus</i>					2	
<i>Polypedilum</i> sp.	1					
<i>Cladotanytarsus</i> sp.	1	6	1			
<i>Micropsectra</i> sp.				2		
<i>Stempellinella</i> sp.		4				
<i>Tanytarsus</i> sp.	3	1	10	17	8	31
<i>Chaoborus</i> sp.	4	2			9	3
TOTALS	32	41	46	84	117	112

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208 (87)

TOTAL OLIGOCHAETES PER SAMPLE FOR EACH DATE. SAMPLE SERIES: ND

DATE: AUG,80 MAY,81 OCT,81 FEB,82 MAY,84 JUL,87

Chaetogaster ?diaphanus						
Dero digitata					3	
Slavina appendiculata		1				
Nais variabilis						4
Nais ?communis						
Nais elinguis						
Ophidonais serpentina						
Pristina idrensis						
Stylaria lacustris						
Spercaria josinae		2	2		29	4
TUBIFICIDAE (+ hair setae)	132	41	188	180	235	322
Aulodrilus pluriseta		6	7	12		1
TUBIFICIDAE (- hair setae)		10	27	75	77	27
Limnodrilus claparedeanus						
Limnodrilus hoffmeisteri						
Limnodrilus sp.	27	1				
LUMBRICULIDAE	81	2				
TOTALS	240	63	224	267	344	358

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208(87)

TOTAL DIPTERA PER SAMPLE FOR EACH DATE SAMPLE SERIES: ND

DATE: AUG,80 MAY,81 OCT,81 FEB,82 MAY,84 JUL,87

	AUG,80	MAY,81	OCT,81	FEB,82	MAY,84	JUL,87
<i>Procladius choreus</i>		21	7	15	30	15
<i>Chironomus thummi</i> sp	1	10	2	23	2	23
<i>Dicrotendipes</i> sp.						
<i>Einfeldia</i> sp.						
<i>Endochironomus</i> sp.						
<i>Glyptotendipes</i> sp.						
<i>Microtendipes</i> sp.						
<i>Pagastiella orophila</i>		1				
<i>Paratendipes albimanus</i>		4				
<i>Polypedilum</i> sp.					1	
<i>Cladotanytarsus</i> sp.						
<i>Micropsectra</i> sp.						
<i>Stempellinella</i> sp.						
<i>Tanytarsus</i> sp.		2	1	1	1	3
<i>Chaoborus</i> sp.	4	10	2	11	17	14
TOTALS	5	48	12	50	51	55

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208 (87)

MISCELLANEOUS INVERTEBRATES OCCURRING ONLY
IN RELATIVELY SMALL NUMBERS

Numbers in parentheses represent the number of individuals of a given taxon in the corresponding sample unit; e.g. SS22(2) indicates 2 individuals in sample unit SS22.

DATE:

AUGUST, 1980

MOLLUSCA
Sphaeriidae SS22(2); SS23(1); SS33(1);
ND36(1).

MAY, 1981

MOLLUSCA
Sphaeriidae SS32(1); SS38(10); SS43(6)
ND89(1); ND98(5).

OCTOBER, 1981

MOLLUSCA
Sphaeriidae ND48(1); ND70(3).

FEBRUARY, 1982

MOLLUSCA
Sphaeriidae SD33(1); SS11(1); SS13(4); SS32(1);
SS34(1);
ND49(3); ND68(3).

MAY, 1984

HIRUDINEA
Helobdella stagnalis ND84(1).

MOLLUSCA
Sphaeriidae SD29(1); SS09(6); SS18(5); SS21(1);
ND36(8); ND53(1); ND65(2); ND69(6);
ND81(2).

EPHEMEROPTERA
Caenis horaria SS09(1);
ND36(1).

ODONATA
Zygoptera (very small) ND69(1).

MEGALOPTERA .pa
Sialis lutaria SD12(1).

ESTHWAITE SAMPLES. NCC CONTRACT HF 3-03-208 (87)

MISCELLANEOUS INVERTEBRATES (CONTINUED).

DATE:
JULY 1987

HIRUDINEA

Helobdella stagnalis SS26(3); SS29(8).

MOLLUSCA

Valvata piscinalis SS24(1).
Sphaeriidae SS22(11); SS24(4); SS29(3);
SS40(1);
ND55(1); ND62(1); ND69(7).

MALACOSTRACA

Asellus aquaticus SS26(2); SS29(1); SS40(2);
ND54(1).

MEGALOPTERA

Sialis lutaria SS40(1).