

KENNET CATCHMENT BIOLOGICAL REPORT SERIES

This report is one of a series of reports about the biology of the River Kennet catchment. The series covers all aspects of biological monitoring of the catchment carried out by the NRA Biology Section. Some reports cover the general status of the catchment, whilst others relate to specific problems identified in the Draft Kennet Catchment Management Plan. A list of reports being produced is given below.

Kennet Catchment Biology Studies

Background Information of the Kennet Catchment

Bacteriology of the Kennet Catchment

Algal Surveys and Eutrophication in the Kennet Catchment

Kennet Catchment Macrophyte Survey

Upper Kennet Weed Growth Investigation

Macroinvertebrates in the Kennet Catchment

Part 1. Water Quality Monitoring

Part 2. Conservation Evaluation by Species Level Studies

Part 3. CPET Analysis

Fish Health Checks (Summary)

Discharge Monitoring in the Kennet Catchment

Part 1. Ecological Effects of Sewage and Trade Effluents

Part 2. Ecological Effects of Fish Farm Discharges

A Comparison of the Ecology of the River Kennet and Kennet and Avon Canal

Standing Waters of the Kennet Catchment (Summary)

Statistical Analysis of the Invertebrate Database

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Figure 1. Fish Farms Monitored in the Kennet Catchment

Appendix 1. Biological Laboratory Reports and Taxa Lists

SUMMARY

- Six fish farms were monitored as part of the Kennet Catchment Survey.
- Biological samples were taken in the receiving watercourses upstream and downstream of each fish farm discharge using the three minute kick-sweep technique. RIVPACS was used to predict the biological scores that each site would have assuming there were no pollution.
- Detrimental changes in the biotic indices downstream of the fish farm effluents were not apparent. In those sites sampled previously, no recent decline in biological quality was seen.
- There was no sign of severe oxygen depletion below any of the discharges, since there was no marked decline in the numbers of freshwater shrimps, used as an indicator, downstream.
- Berkshire and Lambourn Trout Farms had an increase in the abundance of filter feeding Simuliidae (Blackfly) larvae downstream of the effluents indicating an increase in suspended particles. Fobney Fish Farm showed a decrease in filter feeding organisms probably caused by over-siltation. This is thought to be caused by boat traffic and construction work at this site and not by the fish farm. However, increased silt loading of watercourses below some of the fish farms was observed.

1 INTRODUCTION

1.1 Reason For Survey

Fish farms were considered as a possible source of pollution to be monitored as part of the Kennet Catchment Survey.

The types of pollution from fish farms are reduced oxygen levels, ammonia as an excretory product of fish, suspended solids, chemicals from the food, pharmaceuticals and disinfectants.

In an internal NRA report, Davies (1992) found that the chemicals used by different fish farms varied greatly, as did their methods of recording uses. Some kept detailed records whilst others made a calculated guess. The DoE are developing Environmental Quality Standards for many of the chemicals used in Fish Farms.

1.2 Fish Farms

A map showing the location of the fish farms is given in figure 1.

The following table gives the fish farms in the Kennet Catchment, the receiving watercourses and the associated sampling site codes. The sites were selected to allow adequate mixing of effluent with the surface water.

Table 1. Fish Farms In The Kennet Catchment

FISH FARM	WATERCOURSE	UPSTREAM	DOWNSTREAM
Berks Trout Farm	River Dun	PKER.0010	PKER.0011
Church Farm Fish Farm	River Kennet	PKER.00179	PKER.0051
Padworth Fisheries Ltd	River Kennet	PKER.0047	PKER.0137
Fobney Fish Farm	River Kennet	PKER.0149	PKER.0054
Lambourn Trout	River Lambourn	PKER.0059	PKER.0068
Kennet Valley Fisheries (DISCONTINUED)	Moor Ditch	PKER.0069	PKER.0070

1.3 Sampling Sites

PKER.0010	Dun At Inlet to Berks Trout Farm	SU34106870
PKER.0011	Dun Below Berks Trout Farm H'ford	SU35206830
PKER.0179	R. Kennet Below Marlborough STW	SU20226918
PKER.0051	R. Kennet At Mildenhall	SU21506970
PKER.0047	R. Kennet At Inlet to Padworth Fisheries	SU60506660
PKER.0137	R. Kennet Ufton Bridge	SU61806860
PKER.0149	R. Kennet At Inlet to Fobney Fish Farm	SU70407116
PKER.0054	R. Kennet Water Intake Fobney	SU70505710
PKER.0059	R. Lambourn At Bagnor	SU45306910
PKER.0068	R. Lambourn Below Lambourn Trout, Bagnor	SU45706900
PKER.0069	Moor Ditch(Newbury) Above Kennet Valley Fisheries	SU49706720
PKER.0070	Moor Ditch(Newbury) Below Kennet Valley Fisheries	SU49906710

2 METHODS

2.1 Sampling Frequency

The macroinvertebrate fauna was used for monitoring the discharges because they are indicators of organic pollution, are affected by oxygen sags and can show toxic effects.

Invertebrate samples were to be taken for one season unless a detrimental effect was seen. In this instance, samples were to be taken for a second season.

2.2 Sampling Technique

Biological samples were taken upstream and downstream of each fish farm discharge using the three minute kick-sweep technique. The samples were checked in the field for any dead animals and then taken back to the laboratory for sorting and identification of the invertebrates. The Biological Monitoring Working Party (BMWP) score and Average Score Per Taxon (ASPT) were calculated for each sample. The River and InVertebrate Prediction And Classification System (RIVPACS) was used to predicted the BMWP score for the site assuming there was no pollution. The Environmental Quality Indices (EQI) for BMWP score and ASPT were obtained from the observed/predicted ratio. The nearer to one the EQI, the better the biological quality.

It was decided not to use specific indicators of toxicity because the fish farm records of chemicals used were incomplete. If community effects were seen, then further investigation would be undertaken.

The abundance of shrimps was used to determine whether there was, or had been, acute oxygen depletion because they were present at every site and to follow Markman (cited in Alabaster, 1981). High BMWP scoring groups could equally have been used.

3 RESULTS & DISCUSSION

Each fish farm is considered separately and an overview given at the end. None of the fish farms were seen to have a detrimental effect in the first season and consequently none were sampled for a second season. Routine reports and taxa lists are attached in the appendix.

3.1 Berkshire Trout Farm

3.1.1 Biotic indices

The BMWP score increased downstream compared with that upstream so there was no detrimental effect on the biological quality at this site. The ASPT was similar upstream and downstream so there was no shift in the pollution-sensitivity of the community. The EQIs for BMWP and ASPT were greater than one at both sites and top-scoring (pollution-sensitive) taxa were present. Therefore, there was no detrimental effect to the fauna of the River Dun. There has been an improvement in the biological quality at both sites compared with the 1991 samples. However, the previous scores were also greater than those predicted.

3.1.2 Specific Indicators

The abundance of Simuliidae (Blackfly) larvae increased below the fish farm compared with the site above. Hydropsychid caddisfly larvae, another filter feeding family was found below but not above the fish farm. This would indicate an increase in the availability of food for the filter feeders but not so much so as to detrimentally affect their ability to feed. The abundance of shrimps was approximately the same upstream and downstream of the fish farm showing that there was no acute oxygen depletion.

3.1.3 Conclusions

Therefore, the Berkshire Fish Farm was having no overall detrimental effect on the macroinvertebrate fauna of the River Dun.

3.2 Church Farm Fish Farm

3.2.1 Biotic indices

The BMWP scores and ASPTs were similar above and below the fish farm. Top-scoring (pollution-sensitive) taxa were present at both sites. However, the EQI_{BMWP} was approximately 0.75 above and below the fish farm showing that both sites were below their biological potential. Therefore it is possible that the effluent from Marlborough STW was masking any detrimental effect the fish farm may have had on the fauna of the River Kennet.

There has been no improvement at the site below Marlborough STW since 1990 when previously sampled. The site below Church Farm fish farm was sampled for the first time.

3.2.2 Specific Indicators

There was no great change in the abundance of filter and suspension feeding animals indicating no detrimental effect from increased suspended solids. The abundance of shrimps below the fish farm was greater than above, showing that there had been no acute oxygen sag below the fish farm.

3.2.3 Conclusions

Therefore, Church Farm fish farm was having no apparent detrimental effect on the invertebrate fauna of the River Kennet.

3.3 Padworth Fisheries Ltd

3.3.1 Biotic indices

The upstream site was too deep to sample affectively and only limited habitats were possible to sample. Therefore, the site above the fish farm showed a poor biological quality with a BMWP score of 85. The ASPT was high however showing that taxa of various scoring levels were missing so the poor score was probably due to restricted habitat sampling rather than organic pollution. Numerous signal crayfish were present. Below the fish farm, the BMWP score and ASPT both exceeded the predictions for the site. Top-scoring Leptophlebiid mayflies and Gomphid dragonflies were found for the first time at this site. Several signal crayfish were found. The upstream site was sampled for the first time. The downstream site has steadily declined since it was first sampled in 1988. However, the score was still greater than that predicted for the site on this occasion.

3.3.2 Specific Indicators

There was no great change in the abundance of filter and suspension feeding animals indicating no detrimental effect from increased suspended solids. The abundance of shrimps below the fish farm was greater than above, so there had been no acute oxygen sag below the fish farm.

3.3.3 Conclusions

Therefore, there was no apparent detrimental effect caused by Padworth Fisheries Ltd. except for a slight decrease in the biotic score below the discharge. Some chemicals used at this fish farm may have a toxic effect on the macroinvertebrates.

3.4 Fobney Fish Farm

3.4.1 Biotic indices

The BMWP score and ASPT showed a decline in biological quality between the upstream and downstream sites (164 and 131 respectively). High scoring taxa were missing below the fish farm compared with the site above, along with taxa from other scoring levels. The upstream site was sampled for the first time. The downstream site has declined in the last year, probably for the reasons listed above. Previously, the biological quality has been consistently high.

3.4.2 Specific Indicators

Filter-feeding blackfly larvae were not present below the fish farm but were found in the sample above the farm. The site below Fobney fish farm has been steadily silting-up over a period of time. It is thought that this may be due to boat traffic turning with the opening up of the Kennet and Avon Canal to boat traffic, construction of a larger tuning bay and pumping out of a borehole at this site; all these are contributing factors which are likely to cause greater disturbance and siltation than the fish farm. The abundance of shrimps was approximately the same upstream and downstream of the fish farm (between 10 and 99 individuals) showing that there was no acute oxygen depletion.

3.4.3 Conclusions

It cannot be determined whether the fish farm was having a detrimental effect on the invertebrate fauna of the River Kennet since other factors influence the river below the fish farm.

3.5 Lambourn Trout

3.5.1 Biotic indices

The BMWP score was lower below the fish farm (160) than above (190), but both were greater than the scores predicated for those sites (EQI_{BMWP} 1.43 and 1.56 respectively). The ASPTs for both sites were also greater than 1 reflecting the fact that numerous top-scoring (pollution-sensitive) taxa were found at each site. Above Lambourn Trout Farm, there has been no great change in biological quality since 1986 when sampling began, except for one sample in Spring 1990 when the score was lower than usual. This was probably due to the difficulty in sampling all the available habitats due to high water levels. The site below the trout farm was sampled for the first time.

3.5.2 Specific Indicators

The abundance of blackfly larvae increase 100 fold below the fish farm compared with above. This indicates an increase in the abundance of suspended solids as food for the larvae. However, other filter-feeding families showed no such dramatic change in abundance. The

abundance of shrimps was good above and below the fish farm showing that there had been no severe oxygen depletion.

3.5.3 Conclusions

Although the biological quality was good, the increase in blackfly larvae indicated increase silt loading below the fish farm.

3.6 Kennet Valley Fisheries

This fish farm discharge has been discontinued, but samples were taken in case previous discharges had caused an effect. Both sites were sampled for the first time. Several top-scoring families were found both above and below the fish farm and the BMWP score was slightly higher below the farm than above. The EQI_{BMWP} were greater than one at both sites. Pollution-tolerant families were present in their hundreds at the site downstream, whilst they were less abundant upstream. In addition the channel was choked with plants downstream. These may indicate organic enrichment, or be a product of differences in the channel morphology between the two sites.

4 CONCLUSIONS

4.1 Biotic Indices

Detrimental changes in the biotic indices downstream of the fish farm effluents were not apparent. At all fish farms except Church Farm, the EQI_{BMWP} was greater than one. The problem at Church Farm is probably due to water quality problems upstream of the fish farm because the site upstream also has a low EQI_{BMWP} . Mantle, (cited in Alabaster, 1982) found similar results in a study of a fish farm on a clean watercourse, where biotic indices showed no marked deterioration even though there were visual signs of an impact on the watercourse.

4.2 Oxygen Sags

Gammaridae, the freshwater shrimp was used as an indicator for acute drops in oxygen levels. Had serious deoxygenation occurred, the shrimps would have been markedly reduced, if not eliminated. There was no sign of this occurring since there was no marked decline in the numbers of shrimps below any of the fish farms.

4.3 Suspended Solids

Markman, (cited in Alabaster, 1982) found that fish farms with no treatment of the effluent altered the sediment structure in terms of the settlement of finely divided organic solids and increasing the amount of suspended organic matter available for filter feeding and suspension feeding organisms. Berkshire and Lambourn Trout Farms had an increase in the abundance

of filter feeding Simuliidae (Blackfly) larvae in the receiving watercourses below their discharges. Other filter feeding taxa did not show such an increase at these sites. Fobney Fish Farm showed a decrease in filter feeding organisms probably caused by over-siltation. This is thought to be caused by an increase in the boat traffic, and construction work at this site and not by the fish farm. However, increased silt loading of watercourses below some of the fish farms was observed.

4.4 Toxic Effects

There was no evidence of toxic effects on the macroinvertebrates below any of the fish farms. Due to the variation in the chemicals used by each fish farm, and in their methods of recording uses, further research has not been undertaken into the effects of each chemical on the flora and fauna.

5 REFERENCES

Alabaster, J. S. (1982). Report on the Eifac Workshop on Fish-Farm Effluents. Food and Agriculture Organisation of the United Nations, Rome.

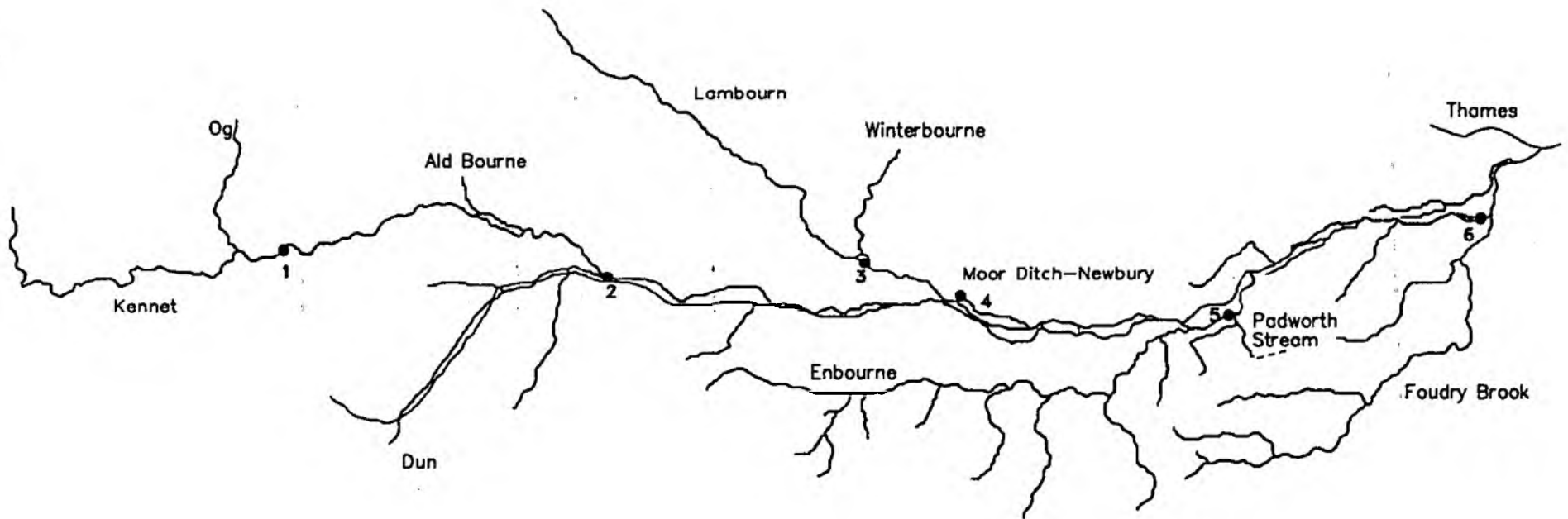
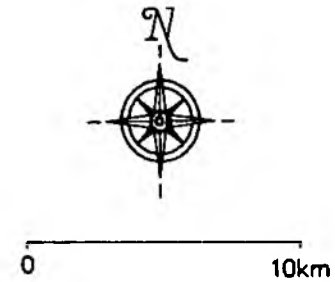
Davies, S. L. (1992). Pollution Prevention - Chemical Use in Fish Farms. Internal NRA Thames Region Report.



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Figure 1. Fish Farms Monitored In The Kennet Catchment

- 1 Church Farm Fish Farm
- 2 Berkshire Trout Farm
- 3 Lambourn Trout Farm Bagnor
- 4 Kennet Valley Fisheries Ltd
- 5 Padworth Fisheries Ltd
- 6 Fobney Fish Farm
- Kennet and Avon Canal

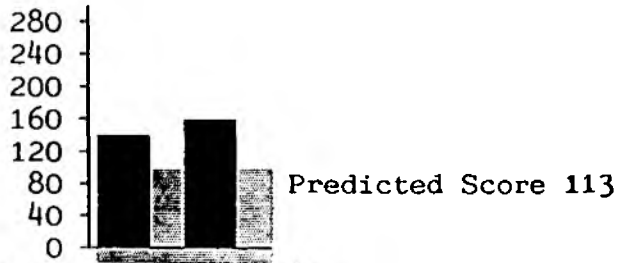


APPENDIX 1

01930261 Dun At Inlet To Berkshire Trout Farm

Site Ref PKER.0010 Grid Ref SU34106870 Sampled 20/07/1993 at 11:00

Scores Current 160 Previous 145 Change is 10% Improvement. Biotic Class A



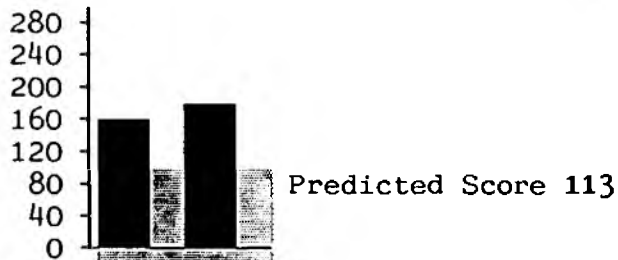
Scores 145* 160* * Non-Routine Sample
Dates 0191 0793

Comments 85% cover, dominated by filamentous algae, and starwort. A similar score to the previous sample at this site. Five top-scoring (pollution-sensitive) families found.

01930262 Dun Below Berkshire Trout Farm

Site Ref PKER.0011 Grid Ref SU35206830 Sampled 20/07/1993 at 10:00

Scores Current 174 Previous 157 Change is 10% Improvement. Biotic Class A



Scores 157* 174* * Non-Routine Sample
Dates 0191 0793

Comments 20% plant cover dominated by filamentous algae and starwort. A similar taxa list to the previous sample. Five top-scoring taxa found.

Survey Number 086

Taxa List for PKER.0010 Dun At Inlet To Berkshire Trout Farm SU34106870

PKER.0011 Dun Below Berkshire Trout Farm SU35206830

Biology Area	01	01
Day	20	20
Month	Jul	Jul
Year	1993	1993
*Non Routine Sample		
Sample Number	0261*	0262*
Site Code	PKER 0010	PKER 0011
EPHEMERELLIDAE	**	**
EPHEMERIDAE		*
LEPTOCERIDAE	*	**
GOERIDAE	**	*
LEPIDOSTOMATIDAE		*
BRACHYCENTRIDAE	*	
SERICOSTOMATIDAE	*	
PSYCHOMYIIDAE		*
CAENIDAE	*	
RHYACOPHILIDAE	*	**
POLYCENTROPIDAE	*	*
LIMNEPHILIDAE	**	*
ANCYLIDAE	**	**
HYDROPTILIDAE	**	**
GAMMARIDAE	**	**
CORIXIDAE	**	**
HALIPLIDAE	*	**
DYTISCIDAE	*	*
ELMIDAE	**	**
HYDROPSYCHIDAE		*
TIPULIDAE	**	*
SIMULIIDAE		**
PLANARIIDAE	*	
BAETIDAE		**
SIALIDAE		*
PISCICOLIDAE	**	*
VALVATIDAE	*	*
HYDROBIIDAE	**	**
LYMNAEIDAE	**	**
PHYSIDAE	*	*
PLANORBIDAE	**	**
SPHAERIIDAE	**	**
GLOSSIPHONIIDAE	*	**
ERPOBDELLIDAE	**	**
ASELLIDAE	**	*
CHIRONOMIDAE	***	***
OLIGOCHAETA	***	***
BMWP Score	160	174
Pred. BMWP Score	113	113
BMWP/Pred BMWP	1.42	1.54
ASPT	5.33	5.27
Predicted ASPT	5.00	5.00
ASPT/Pred ASPT	1.07	1.05
Biotic Class	A	A

01930271 Kennet At Inlet To Padworth Fisheries Ltd, Padworth

Site Ref PKER.0047 Grid Ref SU60506660 Sampled 22/07/1993 at 14:15

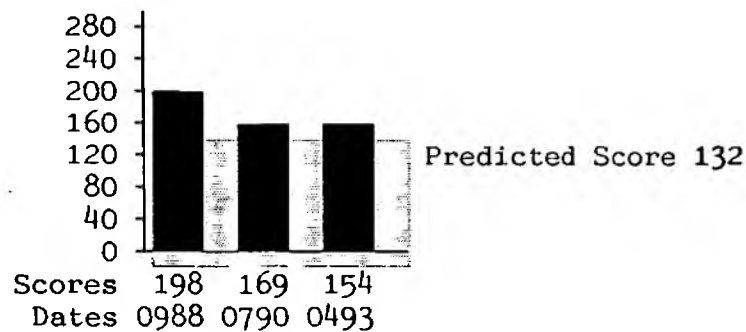
Scores Current 85 Predicted 130 Biotic Class C

Comments Too deep to sample. The low BMWP score reflects the limited habitats sampled rather than poor water quality because the ASPT was greater than that predicted and two top-scoring (pollution-sensitive) families were found. Numerous Signal Crayfish were found.

01930118 Kennet At Ufton Bridge

Site Ref PKER.0137 Grid Ref SU61806860 Sampled 27/04/1993 at 11:30

Scores Current 154 Previous 169 Change is 8% Deterioration. Biotic Class A



Comments Several American Crayfish seen. Five taxa found for the first time including top-scoring Leptophlebiid mayflies and high-scoring Gomphid dragonflies. Several beetle and snail families missing compared with the last sample.

Specially selected samples

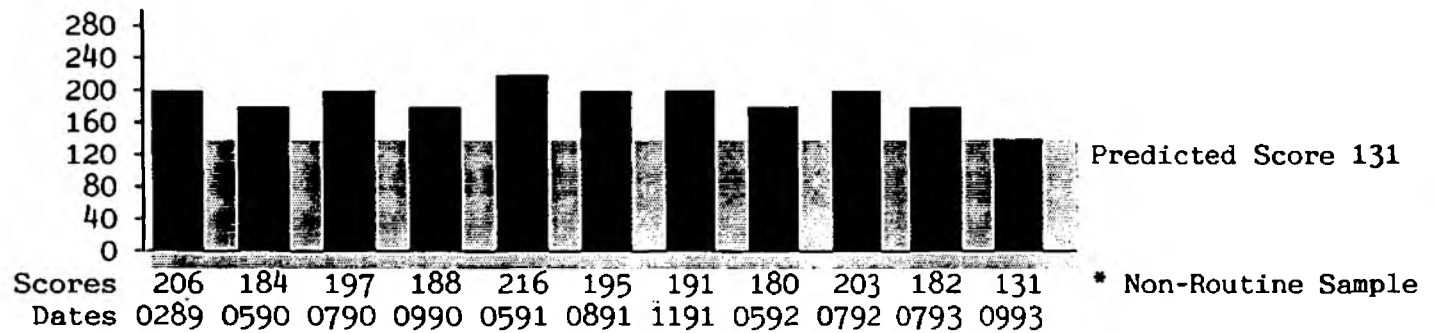
Taxa List for PKER.0047 Kennet At Inlet To Padworth Fisheries Lt SU60506660
 PKER.0137 Kennet At Upton Bridge SU61806860

Biology Area	01	01
Day	22	27
Month	Jul	Apr
Year	1993	1993
*Non Routine Sample		
Sample Number	0271*	0118
Site Code	PKER	PKER
	0047	0137
LEPTOPHLEBIIDAE		*
EPHEMERELLIDAE	*	
EPHEMERIDAE		**
APHELOCHEIRIDAE		*
LEPTOCERIDAE		**
BRACHYCENTRIDAE	**	
ASTACIDAE	**	**
CALOPTERYGIDAE	*	**
GOMPHIDAE		*
PSYCHOMYIIDAE	*	
CAENIDAE		**
POLYCENTROPIDAE	*	
LIMNEPHILIDAE		**
ANCYLIDAE	**	**
HYDROPTILIDAE		*
UNIONIDAE		*
GAMMARIDAE	***	***
PLATYCNEMIDAE		*
COENAGRIIDAE		**
GERRIDAE	*	**
CORIXIDAE		**
HALIPLIDAE		*
ELMIDAE	*	
TIPULIDAE		*
BAETIDAE		*
SIALIDAE		*
VALVATIDAE	*	
HYDROBIIDAE	*	**
SPHAERIIDAE	*	*
ASELLIDAE		*
CHIRONOMIDAE	**	***
OLIGOCHAETA	**	**
BMWP Score	85	154
Pred. BMWP Score	130	132
BMWP/Pred BMWP	0.65	1.17
ASPT	5.67	5.92
Predicted ASPT	5.00	5.20
ASPT/Pred ASPT	1.13	1.14
Biotic Class	C	A

01930385 **Kennet At Inlet To Fobney Fish Farm**
 Site Ref PKER.0149 Grid Ref SU70407116 Sampled 16/09/1993 at 15:00
Scores Current 164 Predicted 130 Biotic Class A

Comments Four top-scoring taxa found.

01930384 **Kennet At Water Intake, Fobney**
 Site Ref PKER.0054 Grid Ref SU70507100 Sampled 15/09/1993 at 15:15
Scores Current 131 Previous 182 Change is 28% Deterioration. Biotic Class B



Comments Viviparidae snails found for the first time, and Hydrophilid beetles found for the first time since 1981. Two top-scoring taxa found. Taxa of various scoring levels missing compared with the last sample. This may be due to increase siltation seen at this site. (Nb.Borehole pumping in vicinity.)

Specially selected samples

Taxa List for PKER.0149 Kennet At Inlet To Fobney Fish Farm SU70407116

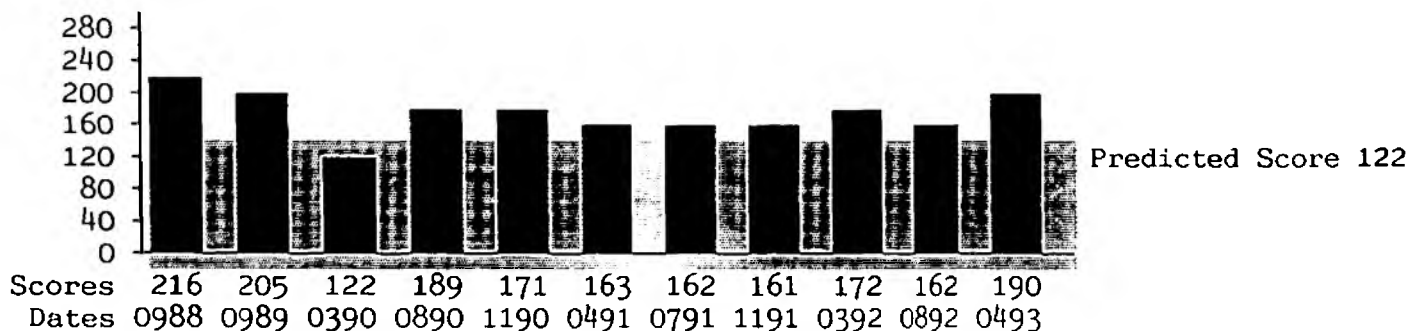
PKER.0054 Kennet At Water Intake, Fobney SU70507100

Biology Area	01	01
Day	16	15
Month	Sep	Sep
Year	1993	1993
*Non Routine Sample		
Sample Number	0385	0384
Site Code	PKER	PKER
	0149	0054
EPHEMERIDAE	*	*
PHRYGANEIDAE	*	
MOLANNIDAE	*	
LEPTOCERIDAE	*	**
CALOPTERYGIDAE	**	*
PSYCHOMYIIDAE	*	
CAENIDAE	*	
POLYCENTROPIDAE	**	
NERITIDAE	*	
VIVIPARIDAE		*
ANCYLIDAE	*	
HYDROPTILIDAE	*	
UNIONIDAE	*	*
COROPHIIDAE		**
GAMMARIDAE	**	**
COENAGRIIDAE	*	**
HYDROMETRIDAE	*	*
GERRIDAE	*	*
CORIXIDAE	**	***
HALIPLIDAE		**
DYTISCIDAE	*	**
HYDROPHILIDAE		*
ELMIDAE		*
SIMULIIDAE	**	
BAETIDAE	**	
SIALIDAE	*	*
PISCICOLIDAE	*	*
VALVATIDAE		**
HYDROBIIDAE	**	**
LYMNAEIDAE		**
PHYSIDAE	*	*
PLANORBIDAE	*	*
SPHAERIIDAE	**	**
GLOSSIPHONIIDAE		*
ERPOBDELLIDAE	*	*
ASELLIDAE	**	*
CHIRONOMIDAE	**	**
OLIGOCHAETA	**	**
BMWP Score	164	131
Pred. BMWP Score	130	131
BMWP/Pred BMWP	1.26	1.00
ASPT	5.47	4.68
Predicted ASPT	5.10	5.12
ASPT/Pred ASPT	1.07	0.91
Biotic Class	A	B

01930093 Lambourn At Bagnor

Site Ref PKER.0059 Grid Ref SU45306910 Sampled 15/04/1993 at 10:35

Scores Current 190 Previous 162 Change is 17% Improvement. Biotic Class A



Comments Eight top-scoring taxa found. No great change in score or taxa list.

01930272 Lambourn Below Lambourn Trout Farm, Bagnor

Site Ref PKER.0068 Grid Ref SU45706900 Sampled 22/07/1993 at 15:30

Scores Current 160 Predicted 112 Biotic Class A

Comments Seven top-scoring (pollution-sensitive) families found. Observed score greater than that predicted. 80% plant cover, mainly *Berula erecta* with traces of other species.

Specially selected samples

Taxa List for PKER.0059 Lambourn At Bagnor SU45306910

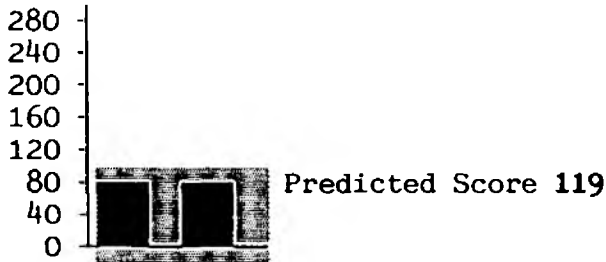
PKER.0068 Lambourn Below Lambourn Trout Farm, Bagnor SU45706900

Biology Area	01	01
Day	15	22
Month	Apr	Jul
Year	1993	1993
*Non Routine Sample		
Sample Number	0093	0272*
Site Code	PKER	PKER
	0059	0068
LEPTOPHLEBIIDAE	**	
EPHEMERELLIDAE	*	**
EPHEMERIDAE	**	**
LEUCTRIDAE		*
LEPTOCERIDAE	**	**
GOERIDAE	**	*
LEPIDOSTOMATIDAE	*	*
SERICOSTOMATIDAE	*	*
CALOPTERYGIDAE	*	*
CAENIDAE	**	
RHYACOPHILIDAE	**	***
POLYCENTROPIDAE	**	*
LIMNEPHILIDAE	***	**
ANCYLIDAE	*	**
HYDROPTILIDAE	**	
GAMMARIDAE	***	***
CORIXIDAE	**	
HALIPLIDAE		*
DYTISCIDAE		*
GYRINIDAE	*	
ELMIDAE	**	**
HYDROPSYCHIDAE	*	
TIPULIDAE	*	
SIMULIIDAE	*	***
BAETIDAE	***	**
SIALIDAE	**	*
PISCICOLIDAE	*	
HYDROBIIDAE	*	*
LYMNAEIDAE	*	
PHYSIDAE		*
PLANORBIDAE	**	**
SPHAERIIDAE	**	
GLOSSIPHONIIDAE	*	**
ERPOBDELLIDAE	*	**
ASELLIDAE	*	*
CHIRONOMIDAE	***	**
OLIGOCHAETA	**	**
BMWP Score	190	160
Pred. BMWP Score	122	112
BMWP/Pred BMWP	1.56	1.43
ASPT	5.76	5.93
Predicted ASPT	5.20	4.90
ASPT/Pred ASPT	1.11	1.21
Biotic Class	A	A

01930284 Kennet Below Marlborough Stw

Site Ref PKER.0179 Grid Ref SU20226918 Sampled 26/07/1993 at 13:45

Scores Current 84 Previous 72 Change is 16% Improvement. Biotic Class C



Scores 72* 84* * Non-Routine Sample
Dates 1190 0793

Comments Slightly higher score than 1990 sample. Limnephilidae, Ancyridae, Tipulidae, Simuliidae & Baetidae found for the first time.

01930336 Kennet At Mildenhall

Site Ref PKER.0051 Grid Ref SU21506970 Sampled 26/08/1993 at 10:40

Scores Current 88 Predicted 114 Biotic Class C

Comments Callitriche and Ranunculus present. Two top-scoring taxa were found.

Survey Number 115

Taxa List for PKER.0179 Kennet Below Marlborough Stw SU20226918
 PKER.0051 Kennet At Mildenhall SU21506970

Biology Area	01	01
Day	26	26
Month	Jul	Aug
Year	1993	1993
*Non Routine Sample		
Sample Number	0284*	0336*
Site Code	PKER 0179	PKER 0051
EPHEMERELLIDAE	**	**
GOERIDAE		*
RHYACOPHILIDAE	*	
LIMNEPHILIDAE	*	*
ANCYLIDAE	**	**
GAMMARIDAE	**	***
DYTISCIDAE	*	*
ELMIDAE	*	**
TIPULIDAE	*	*
SIMULIIDAE	*	**
PLANARIIDAE	*	
BAETIDAE	*	**
PISCICOLIDAE	*	*
HYDROBIIDAE		**
PLANORBIDAE	*	*
SPHAERIIDAE	**	**
GLOSSIPHONIIDAE	*	*
ERPOBDELLIDAE	**	*
ASELLIDAE		*
CHIRONOMIDAE	***	**
OLIGOCHAETA	**	**
BMWP Score	84	88
Pred. BMWP Score	119	114
BMWP/Pred BMWP	0.71	0.77
ASPT	4.67	4.63
Predicted ASPT	5.10	5.10
ASPT/Pred ASPT	0.92	0.91
Biotic Class	C	C

01930325 **Moor Ditch (Newbury) Above Kennet Valley Fisheries**
Site Ref **PKER.0069** Grid Ref **SU49706720** Sampled 19/08/1993 at 16:30
Scores Current 112 Predicted 91 Biotic Class B

Comments Three top-scoring families present. A single American Crayfish found. The site was wide, deep and silty. The EQI for BMWP was 1.23 (ie. the observed score exceeded that predicted).

01930326 **Moor Ditch (Newbury) Below Kennet Valley Fisheries**
Site Ref **PKER.0070** Grid Ref **SU49906710** Sampled 19/08/1993 at 16:00
Scores Current 131 Predicted 89 Biotic Class B

Comments Five top-scoring taxa found. The channel was choked with plants in places: the site had 90% cover. Callitriche, Berula erecta and Lemna minor were dominant. The site was silty and slow flowing. Pollution-tolerant taxa were abundant (in their 100s) suggesting enrichment. EQI for BMWP = 1.46.

Survey Number 109

Taxa List for PKER.0069 Moor Ditch (Newbury) Above Kennet Valley Fisheries SU49706720

PKER.0070 Moor Ditch (Newbury) Below Kennet Valley Fisheries SU49906710

Biology Area	01	01
Day	19	19
Month	Aug	Aug
Year	1993	1993
*Non Routine Sample		
Sample Number	0325*	0326*
Site Code	PKER	PKER
	0069	0070
EPHEMERIDAE		*
PHRYGANEIDAE	*	**
MOLANNIDAE	*	*
LEPTOCERIDAE	**	*
GOERIDAE		*
ASTACIDAE	*	
PSYCHOMYIIDAE	*	
LIMNEPHILIDAE	*	**
ANCYLIDAE		*
GAMMARIDAE		***
COENAGRIIDAE	*	
GERRIDAE		*
NOTONECTIDAE		*
CORIXIDAE	*	*
HALIPLIDAE	**	**
DYTISCIDAE	*	*
HYDROPHILIDAE	*	
ELMIDAE	*	*
SIALIDAE	**	**
PISCICOLIDAE		*
HYDROBIIDAE	*	***
PHYSIDAE	*	**
PLANORBIDAE	**	**
SPHAERIIDAE	**	***
GLOSSIPHONIIDAE		**
ERPOBDELLIDAE		*
ASELLIDAE	**	***
CHIRONOMIDAE	**	**
OLIGOCHAETA	*	**
BMWP Score	112	131
Pred. BMWP Score	91	89
BMWP/Pred BMWP	1.23	1.47
ASPT	5.33	5.24
Predicted ASPT	4.60	4.60
ASPT/Pred ASPT	1.16	1.14
Biotic Class	B	B