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*National Rivers Authority
North West Region*



Report on the 1995
Stock Assessment
of the Douglas Catchment
EA/NW/FTR/96/2

**GUARDIANS OF THE WATER
ENVIRONMENT**

Report on the 1995 Stock Assessment of the Douglas Catchment

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CONTENTS

1.	Summary & Recommendations	1.
2.	Introduction	3.
	2.1 . . The Douglas Catchment	3.
	2.2 . . The River Douglas Navigation	5.
	2.3 . . Water Quality	5.
3.	Methods	8.
	3.1 . . Estimation of fish populations	8.
	3.2 . . Coarse fish stocking experiment	9.
	3.3 . . The National Fisheries Classification Scheme	9.
4.	Results	11.
	4.1 . . Species present	11.
	4.2 . . Brown trout densities	11.
	4.3 . . Coarse fish densities	11.
	4.4 . . Coarse fish stocking experiments	16.
5.	Discussion	19.
	5.1 . . River Douglas	19.
	5.2 . . River Yarrow	21.
	5.3 . . River Lostock	23.
	5.4 . . Stocking experiments	24.
6.	Conclusion	25.
7.	References	26.
	Appendices	27.

1. SUMMARY & RECOMMENDATIONS

1. The River Douglas has a long industrial heritage beginning in the early 18th century with its use by boats carrying goods between Wigan and Tarleton. The River and its tributaries have also historically been, and to a certain extent are still, subject to polluting inputs from the urban, agricultural and industrialised areas located within its catchment. Water quality in the system is generally of Class 2 with some areas of Class 1B or Class 3.
2. An electric fishing survey of the River Douglas and its main tributaries was undertaken in the summer months of 1995. Eighty-two sites were sampled by wading or electric fishing punt. Problems were encountered in the lower reaches of the rivers because of excessive widths and depths. Results were analysed according to the National Fisheries Classification Scheme.
3. Brown trout were caught at 13 sites, major coarse fish species at 57 sites.
4. The River Douglas and its tributaries were found to contain very poor coarse fish populations above the weir at Gathurst, except for those originating from Pearsons and Scotsmans Flash's. Between the weir and the town of Parbold, improvements in water quality and habitat type produced mixed coarse fish populations.
5. The River Yarrow and its tributaries contained generally poor coarse fish populations throughout, except at a single site below the weir at Croston.
6. The River Lostock and its tributaries contained poor coarse fish populations from the headwaters until the impassable weir at Farrington. Below the weir, fish populations were amongst the highest found at any site in the River Douglas system.
7. Regression analysis enabled the length-weight relationship to be determined for four coarse fish species.
8. A coarse fish stocking experiment was undertaken on the River Lostock. Recoveries of previously marked chub were generally good, indicating a reasonable survival and movement of hatchery reared fish following their introduction into a river system.
9. In the course of surveying the River Yarrow, five chub were caught that had originated from a stocking experiment in 1992.
10. Barriers to movement of fish were identified at the following places:

River Douglas -	Gathurst Weir	(SD 543 073)
	Scholes Weir	(SD 587 055)
	Worthington Weir	(SD 582 104)
River Yarrow -	Croston Weir	(SD 498 180)
River Lostock -	Farrington	(SD 536 239)

11. The following areas have been identified as potentially suitable for stocking with juvenile coarse fish from the Leyland Hatchery in 1996. Recommended numbers and species of fish are given:
 - The River Douglas around the village of Horwich with 1,000 each of chub, dace and roach.
 - The middle and upper reaches of the River Tawd with 5,000 chub and roach.
 - The River Yarrow above Croston weir, especially in the area around Eccleston bridge with 5,000 each of chub, dace and roach.
 - The River Lostock above Farrington Weir.

12. The following areas have been identified as potentially suitable for stocking with trout.
 - Syd Brook, following the pollution of 1995.
 - The upper reaches of the River Lostock.

13. The survival of fish introduced into stretches of river that were either previously fishless or had poor fish populations should be closely monitored.

2. INTRODUCTION

During the early stages in the production of the River Douglas Catchment Management Plan, it became apparent that very little data existed on the populations of coarse and salmonid fish species within the River Douglas system. The data that did exist was largely anecdotal, consisting of catch reports from anglers or water bailiffs, or of dead and distressed fish following pollution incidents. This study was initiated to assess the status of coarse and salmonid fish species within the River Douglas system and so address the lack of knowledge.

Eighty two sites were surveyed by electric fishing, including 14 sites using an electric fishing punt and up to four anodes. The data was analysed according to a new National Fisheries Classification Scheme. This classified the sites by the fish stocks present and compared the results with a database containing information from sites around the country that have similar habitat types.

A stocking experiment was also undertaken in the River Lostock using chub reared at the Leyland Hatchery. These were marked with an identifiable blue spot in the spring of 1995 and then released into three, previously surveyed, locations in the river. These sites were then resurveyed during the summer stock assessment.

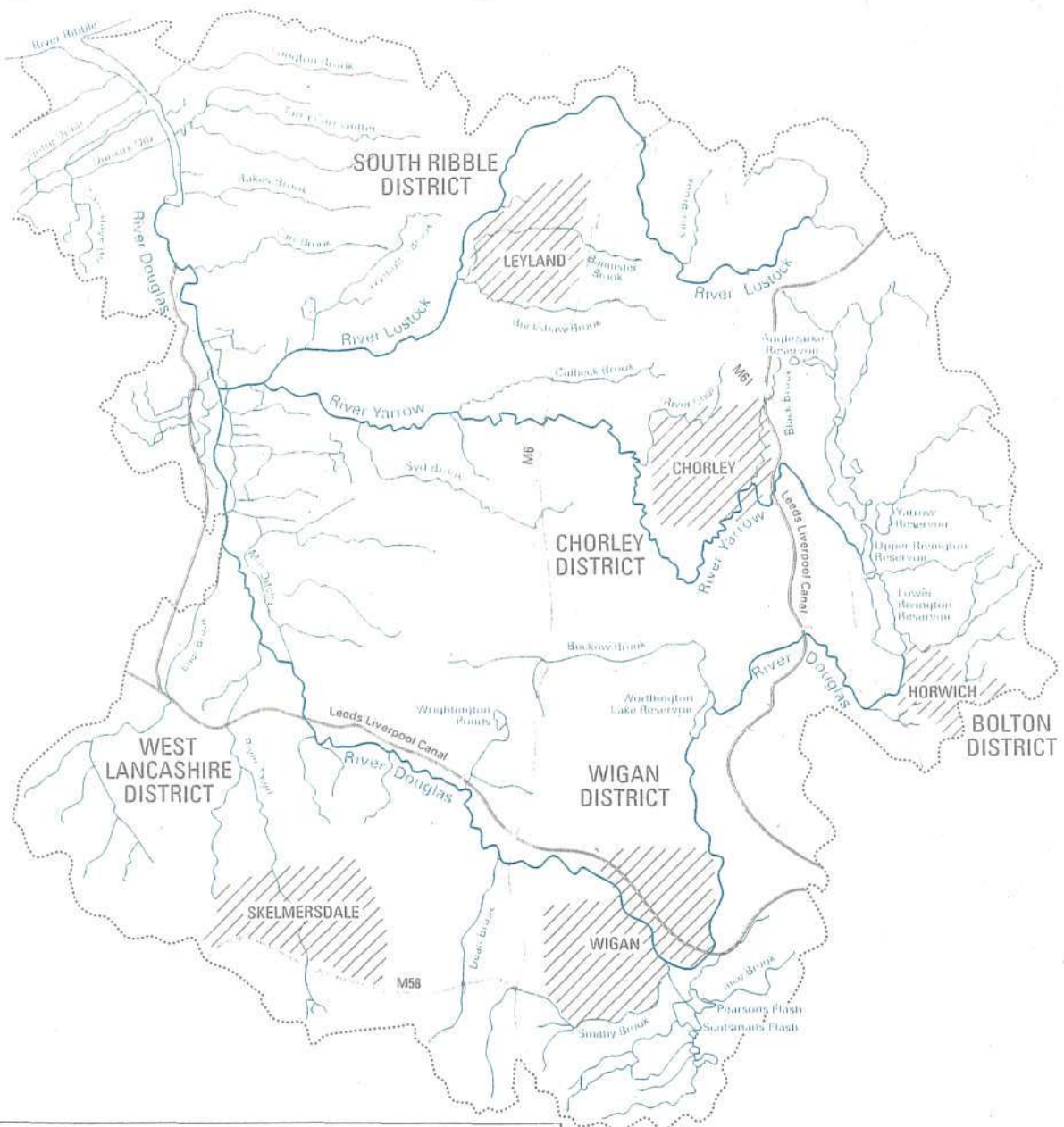
2.1 The Douglas Catchment

The River Douglas rises on Rivington Moor at Winter Hill and drains an area of 456 square kilometres before joining the River Ribble some 8 km west of Preston, Lancashire. The river passes through the town of Wigan and areas of intensively grazed farmland. Its major tributaries are the River's Lostock and Yarrow which drain the north and central parts of the catchment respectively (Figure 1).

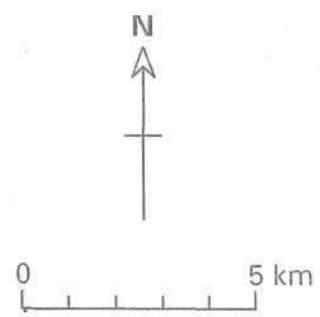
The River Lostock receives run off from Rivington Moor and drainage from the town of Leyland and from intensively grazed farmland in its lower reaches. It joins the River Yarrow to the west of Croston village.

The River Yarrow is principally a rural river though it receives considerable urban drainage from the town of Chorley and the village of Croston. It is joined by the Lostock and flows into the Douglas in its tidal reaches.

Figure 1. River Douglas Catchment.



KEY	
	Catchment boundary
	Built up area
	Rivers
	Reservoirs / Lakes
	Canal
	Major roads
	District Council boundary



2.2 The River Douglas Navigation

Following an act of Parliament in 1720, and extensive works on the river, the River Douglas became navigable below Wigan. Boats and barges up to fifty-five feet long with beams of around 14 feet and draughts in excess of 4' 6" were used to carry cargoes, predominantly from the coal fields around Wigan. Cargoes up to 20 tons in weight of coal, cannel, cinders, turf, and paving stones were carried between Wigan and Tarleton Lock where they were then transferred into larger sea-going vessels trading to locations such as Lancaster, Dublin and Drogheda. Return cargoes comprised predominantly limestone though also included timber, hides, kelp, soap, ashes, barley and beans.

The Douglas Navigation was used for only 43 years, being superceded on construction of the Leeds Liverpool canal, which began soon after the presentation of a Bill to Parliament in 1770. Little now remains of the navigation following the passage of time and alterations to improve drainage, though some weirs are still present and the river retains some deep stretches.

2.3 Water Quality

The general water quality of the Douglas catchment, inferred from data on the invertebrate fauna present, is of Class 2. Some areas in the upper reaches of the Rivers Yarrow and Lostock are of water quality class 1B. Small areas of the system are also of class 3 (Figure 2). In general the water quality of the whole Douglas system has been improving over the last few years largely because of work by the NRA's Pollution Control and Fisheries Functions in conjunction with an increasingly environmentally aware general public.

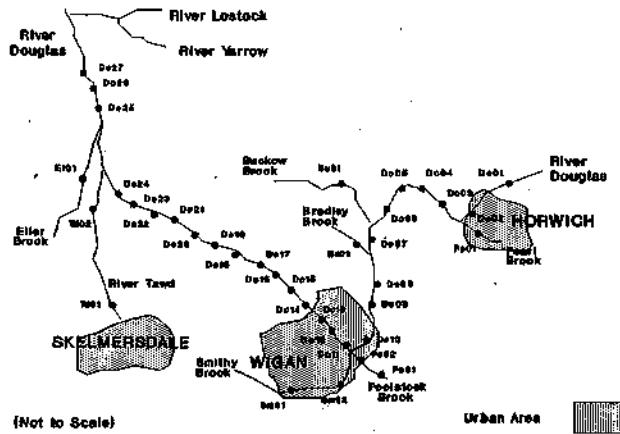
The Douglas catchment receives major discharges from 12 Wastewater Treatment Works with a total population equivalent of 550,000. This includes the major complex at Hoscar which serves Wigan and Skelmersdale and has a combined population equivalent of 374,000. The Hoscar treatment works discharges to the river Douglas downstream of Parbold. These Treatment Works are as follows: Longton (SD 468 252), Hesketh (SD 456 239), Croston (SD 481 187), Chorley (SD 565 176), Leyland (SD 521 208), Brindle (SD 601 242), Westhead (SD 441 082), Bispham Green (SD 488 135), Wigan (SD 481 120), Skelmerdale (SD 476 110), Coppull (SD 585 126), Horwich (SD 622 109).

There are also 160 combined sewer overflows, most concentrated in the towns of Wigan and Chorley, and 5 direct industrial discharges to the Douglas Catchment. The large number of road and rail links serving the area may also affect water quality by contaminated drainage. Further road links are also proposed or are currently under construction.

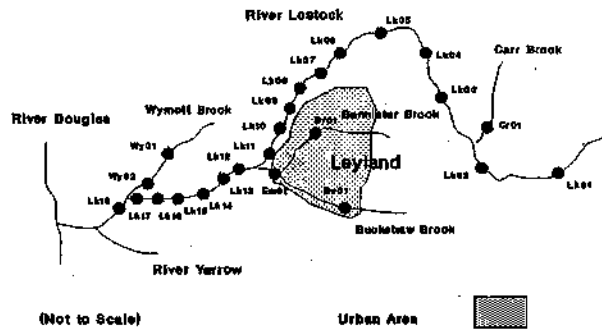
Figure 3.

Survey Sites 1995

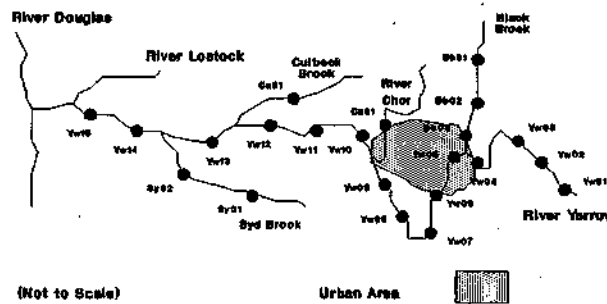
The River Douglas System.



The River Lostock System.



The River Yarrow System.



3. METHODS

3.1 Estimation of fish populations.

The main river and tributaries within the study area were sampled by electric fishing at approximately 1km intervals. All sites were surveyed using pulsed D.C. and either one, two, or four hand-held anodes (Figure 3).

At all sites, the number of fish of each species and the fork length (to the nearest 5mm) of individual fish was recorded. Examination of the length-frequency distribution for juvenile trout made it possible to separate into 0+ and older than 0+ age classes. For the purposes of this report, all trout of less than 95mm were regarded as being of the 0+ age group.

The biomass of each individual fish caught was also recorded, to the nearest gram. When this measurement was not available at a site an estimation of the weight was made by consideration of standard length-weight equations (see appendix). Estimated fish biomasses at specific sites are marked with an asterisk (*) in the appendix.

As part of an associated coarse fish stocking experiment, six sites were surveyed by the successive removal of fish using three fishings between an upstream and downstream stopnet (site numbers Lk07, Lk08, Lk12, Lk13, Lk15 and Lk16). Quantitative estimates of fish populations were calculated by the method of Carle and Strub (1978) and expressed as numbers of fish of each species per 100m². If the overall probability of capture was greater than or equal to 0.3 and was constant between fishings (as indicated by chi squared analysis) then the population estimate was considered to be valid. Biomass per 100 m² for each species was calculated at these sites by:

$$\text{Biomass of species A} = \frac{\text{Total weight of species A at site}}{\text{Total number of species A at site}} \times \text{population estimate of species A}$$

Fourteen sites were surveyed using either two or four anodes operated from a punt (site numbers Do14 to Do27). These sites were fished by drifting downstream to a stop-net. The remaining sixty-two sites were sampled by a single fishing in an upstream direction towards a stop net. Minimum estimates of the fish numbers and biomass for these sites was calculated per 100m² by:

$$\text{Number or Biomass of species A} = \frac{\text{Number or weight of Species A}}{\text{Total area fished}} \times 100$$

Estimates of fish numbers and biomass for each site were then input into the National Fisheries Classification Scheme (see section 3.3).

3.2 Coarse fish stocking experiment.

An investigation into the effectiveness of stocking hatchery-reared coarse fish was undertaken using 1+ aged chub reared at the NRA coarse fish farm at Leyland. Three sites were chosen on the River Lostock for the study: at Farington, Leyland Fish Farm, and at Ulnes Walton. At each site two fully quantitative electric fishing surveys were undertaken, above and below the chosen stocking area, in the early spring of 1995. Chub were marked with spots of alcian blue dye using a panjet injector and then released into the areas chosen in early May 1995.

Whilst surveying the River Lostock during the summer, all chub caught were checked and any with panjet marks noted. The six sites quantitatively surveyed previously in spring 1995 were resurveyed quantitatively in the summer. In this way the movement of stocked fish and their survival could be investigated and this information used in determining a coarse fish stocking policy for the future.

Table 1. Stocking sites for panjet marked chub 1995.

Stocking site	Site codes	Panjet marks	Number stocked
Farrington	Lk07 & Lk08	Base of anal fins and base of pelvic fins	800
Leyland Fish Farm	Lk12 & Lk13	Base of anal fins only	1000
Ulnes Walton	Lk15 & Lk16	Base of pelvic fins only	1000

3.3 The National Fisheries Classification Scheme

The National Fisheries Classification Scheme (NFCS) was developed in order to allow the fishery status of any survey site in England and Wales to be compared with a national data base of sites with a similar habitat type.

This classification system operates on four levels of detail; from species type (level 1) up to the status of the whole fishery (level 4). The most fundamental division in the hierarchy is between the numbers of salmonids and the biomass of coarse fish per 100 m² of river surveyed. River gradient and channel width are also used as descriptors of broad habitat type.

The NFCS uses a database containing 949 sites, fished quantitatively, and encompassing the range of fishery types found in the UK. Class boundaries for the classification system were then determined from this database.

To use the NFCS, raw survey data including: the numbers of each year class of salmonids (0+ and older than 0+ salmon and trout) and the biomass of coarse fish (classified into Linnophilic, Rheophilic, Predator species and Eels) per 100m² surveyed were entered into the database. A classification of the naturalness of the species present as well as broad habitat types are also entered. A level of precision is also included. For the semi quantitative sites surveyed in this assessment by wading, a nominal precision of 0.50 was used. For the sites surveyed with an electric-fishing punt a nominal precision of 0.10 was used. From this data a classification of each site was made.

The NFCS classifies sites either in an Absolute (Absolute Classification) or Relative (Relative Classification) manner. The Absolute classification compares fish abundance at the site with all other sites in the national database within which the species group is present. The Relative classification compares the fish abundance at the site with all other sites in the same broad habitat type. Sites are assigned a class according to where they correspond to in the database structure (Table 2). In this study results were reported at classification level 3 which generates absolute classifications for the total coarse fish and the total salmonids; and relative classifications for coarse fish except eels and for total salmonid parr equivalents.

Table 2. Class descriptions for National Fisheries Classification Scheme

Class	Description
	Absolute Classifications
A	Within the upper quintile of sites/reaches containing species/age group
B	Within the second quintile of sites/reaches containing species/age group
C	Within the third quintile of sites/reaches containing species/age group
D	Within the fourth quintile of sites/reaches containing species/age group
E	Within the lower quintile of sites/reaches containing species/age group
F	Species/age group absent
	Relative Classification
a	Within the upper quintile of sites/reaches containing species/age group
b	Within the second quintile of sites/reaches containing species/age group
c	Within the third quintile of sites/reaches containing species/age group
d	Within the fourth quintile of sites/reaches containing species/age group
e	Within the lower quintile of sites/reaches containing species/age group

4. RESULTS

4.1 Species present

A total of 16 species were found within the study area. These are listed below. Full details of species caught and descriptions of the habitat are given for each site in the appendix.

Brown trout	<i>Salmo trutta</i>
Chub	<i>Leuciscus cephalus</i>
Dace	<i>Leuciscus leuciscus</i>
Roach	<i>Rutilus rutilus</i>
Bream	<i>Abramis brama</i>
Perch	<i>Perca fluviatilis</i>
Pike	<i>Esox lucius</i>
Tench	<i>Tinca vulgaris</i>
Barbel	<i>Barbus barbus</i>
Gudgeon	<i>Gobio gobio</i>
Lamprey	<i>Lampetra fluviatilis</i>
Eel	<i>Anguilla anguilla</i>
Minnow	<i>Phoxinus phoxinus</i>
Stickleback	<i>Gasterosteus aculeatus</i>
Stoneloach	<i>Barbatula barbatula</i>
Bullhead	<i>Cottus gobio</i>

4.2 Brown trout densities

Brown trout were caught at 13 of the sites surveyed, mostly in very low densities. At only one site were significant numbers caught (Do01). Presence of trout in a river stretch is indicated in the classification maps (Figures 5,6 and 7) as the river coloured blue. Relative and absolute classifications for trout are given for each site in the appendix.

4.3 Coarse fish densities.

The density of coarse fish is given for each site in the appendices 3A, 3B and 3C. The relative and absolute classifications for coarse fish abundance are indicated in Figures 5, 6 and 7. Absolute classifications for coarse fish on the River Douglas and its minor tributaries suggest that the fishery status was generally poor though with occasionally higher densities at specific sites (for example Po01). On the River Yarrow system absolute densities were again generally poor or absent. The River Lostock contained good coarse fish densities below the impassable weir at Farrington. These data are summarised in Table 3.






Figure 4.

Key for Colour Maps National Classification Scheme Coarse Fish

Absolute Classification

- A Within upper quintile of sites
- B Within second quintile of sites
- C Within third quintile of sites
- D Within fourth quintile of sites
- E Within lower quintile of sites
- F Absent

Relative Classification

-  Within upper quintile of sites
-  Within second quintile of sites
-  Within third quintile of sites
-  Within fourth quintile of sites
-  Within lower quintile of sites

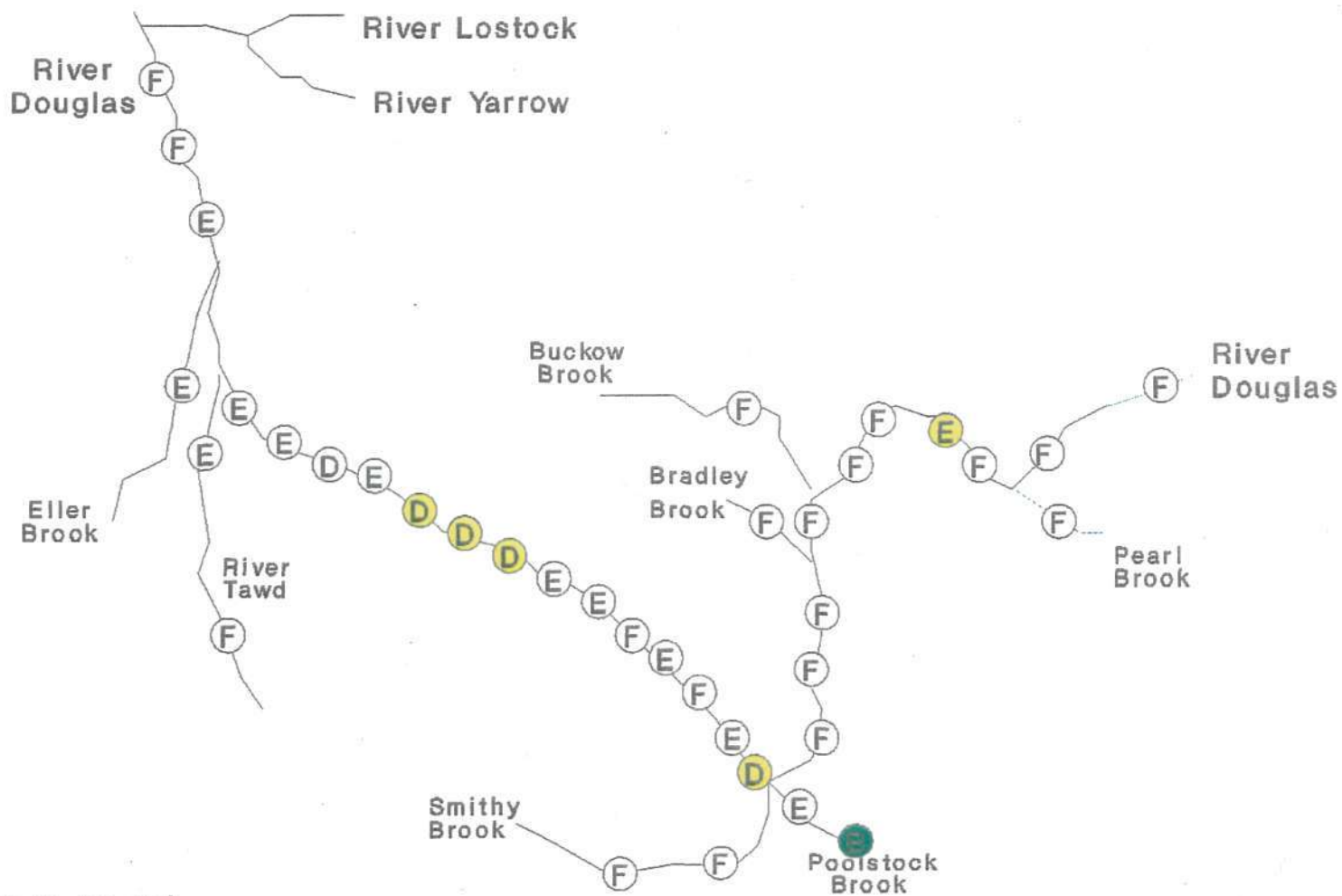
River length

-  Trout present
-  Trout absent

Figure 5.

The River Douglas System.

National Fisheries Classification

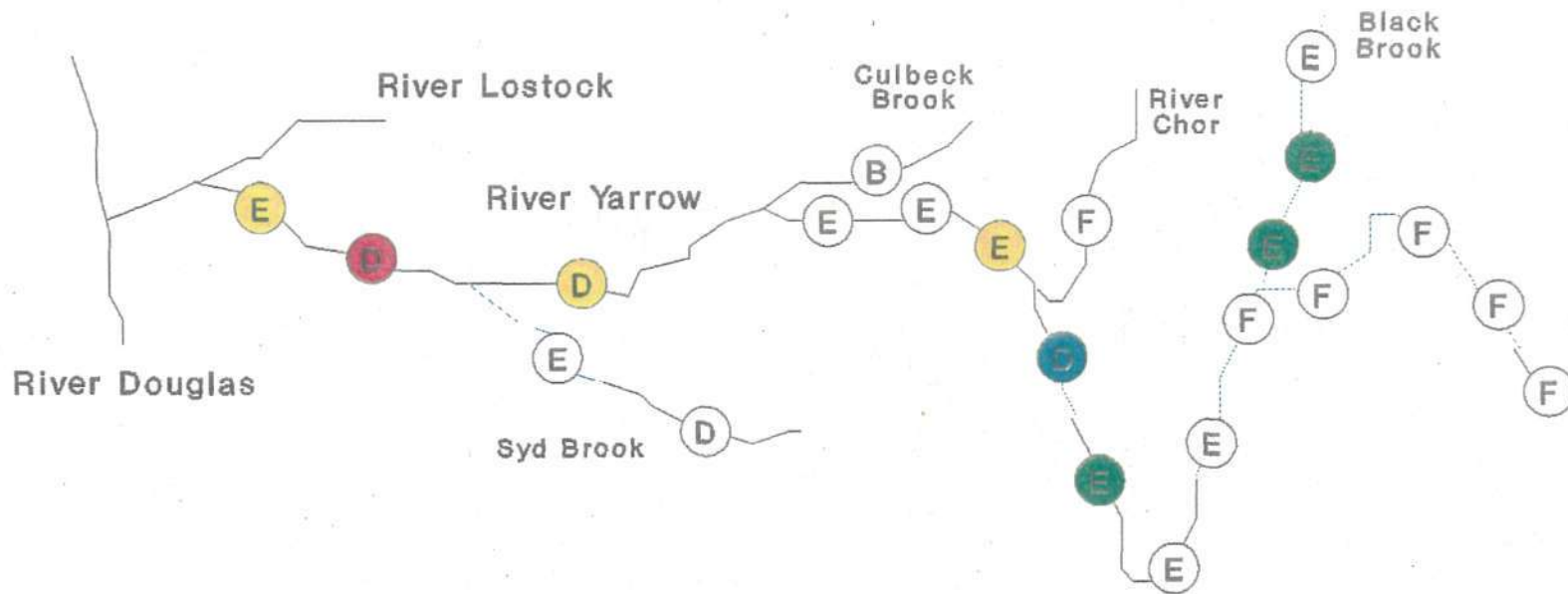


(Not to Scale)

Figure 6:

The River Yarrow System

National Fisheries Classification

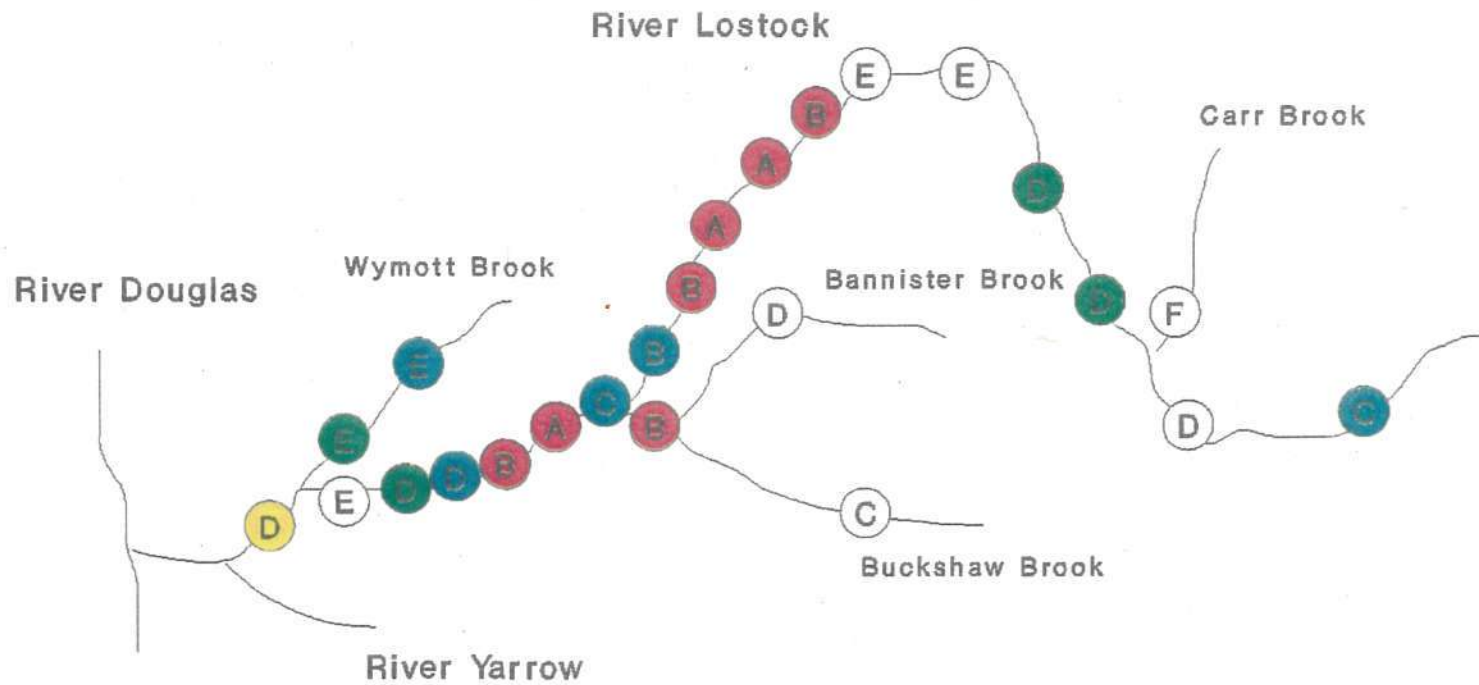


(Not to Scale)

Figure 7.

The River Lostock System.

National Fisheries Classification



(Not to Scale)

Table 3. Classification of sites per river system

Class	River Douglas & tributaries		River Yarrow & tributaries		River Lostock & tributaries		Total	
	Absolute	Relative	Absolute	Relative	Absolute	Relative	Absolute	Relative
A	-	-	-	1	3	7	3	8
B	1	-	1	1	5	5	7	6
C	-	1	-	3	3	4	3	8
D	5	5	4	3	7	1	16	9
E	12	31	11	14	5	7	28	52
F	19	N/A	6	N/A	1	N/A	26	N/A
Total	38	38	22	22	24	24	83	83

4.4. Coarse fish stocking experiments

4.4.1 Experiment in 1995

The returns of panjet marked chub from the coarse fish stocking experiment are shown in Table 4. The total returns were:

- 23 anal fin marked
- 31 pelvic fin marked
- 22 anal and pelvic fins marked

The total river length in which marked chub were recaptured was approximately 4.35 km, no marked fish were caught above the weir at Farrington or below Ulms Walton bridge.

Table 4. Recaptures of panjet marked chub 1995

Site	Marked chub stocked (if any)	Marked chub recaptured
Lk07	800 x marked on anal and pelvic fins	1 x anal fin marked 2 x pelvic fin marked 3 x anal and pelvic fin marked
Lk08		4 x anal fin marked 3 x pelvic fin marked 5 x anal and pelvic fin marked
Lk09		10 x anal fin marked 6 x pelvic fin marked 4 x anal and pelvic fin marked
Lk10		1 x anal fin marked 7 x pelvic fin marked 5 x anal and pelvic fin marked
Lk11		4 x anal fin marked 6 x pelvic fin marked 2 x anal and pelvic fin marked
Lk12	1000 x marked on anal fin	2 x anal fin marked 3 x pelvic fin marked 1 x anal and pelvic fin marked
Lk13		1 x anal fin marked 1 x pelvic fin marked
Lk14		2 x pelvic fin marked 1 x anal and pelvic fin marked
Lk15	1000 x marked on pelvic fins	1 x anal and pelvic fin marked
Lk16		1 x pelvic fin marked

The effect of chub stocking on the resident fish populations in the River Lostock are shown in Table 5. Total fish numbers and biomasses per 100m² were all substantially increased following stocking. Numbers of chub per 100m² were increased at all sites except Lk08, and biomasses of chub per 100m² increased at all sites except Lk07. Absolute and relative classifications from the National Fisheries Classification Scheme were also improved following chub introduction compared with the situation prior to stocking.

Table 5. Summary of pre and post-stocking sites

Site No.	Survey	Site Totals		Chub		National Fisheries Classification Scheme	
		No. fish / 100m ²	biomass /100m ²	No. fish / 100m ²	biomass /100m ²	Absolute	Relative
Lk07	pre-stocking	12.5	1391.2	7.3	1013.0	C	b
	post-stocking	74.5	3257.2	15.5	994.5	B	a
Lk08	pre-stocking	96.5	1919.0	63.8	1113.3	C	a
	post-stocking	134.6	7221.6	50.0	2610.0	A	a
Lk12	pre-stocking	8.4	551.8	1.3	426.8	D	c
	post-stocking	50.0	2853.7	18.5	1261.6	C	b
Lk13	pre-stocking	12.8	1302.1	0.2	113.3	C	c
	post-stocking	35.0	4162.7	10.5	1708.7	A	a
Lk15	pre-stocking	11.9	595.0	7.2	381.0	D	c
	post-stocking	24.0	1180.4	8.0	564.5	D	b
Lk16	pre-stocking	19.8	330.7	2.0	9.8	E	d
	post-stocking	28.3	870.1	4.4	280.3	D	c

4.4.2 Chub stocking experiment in 1993

In the course of surveying the River Yarrow in 1995 five chub were caught that had been introduced during a previous stocking experiment in 1993 (Lambert and Walsingham 1994). In this 1993 experiment, 752 panjet marked chub were stocked into each of 4 sites. A total of 25 marked chub were subsequently recaptured, most below the weir at Croston. The low returns of marked fish was thought due to chronic levels of pollutants, particularly ammonia, preventing the establishment of a coarse fish population. In the 1995 Yarrow survey 5 of the chub stocked in 1993 were recaptured, 3 the fish were recaptured at Plymouth Bridge and the remaining 2 chub recaptured below Croston weir.

5. DISCUSSION

5.1 River Douglas

The generally poor fish populations found in the River Douglas and its tributaries can probably be attributed to a combination of discreet and diffuse polluting inputs and, to a certain extent, inefficiency of the sampling equipment where the rivers were wide or deep, especially in their lower reaches.

At the topmost site, above Horwich (Do01), the river passes beneath a busy road but receives little polluting inputs, resulting in an inferred water quality classification of 1A and a good population of brown trout. Below Horwich, water quality drops to Class 2, probably because of inputs from the town and from road run off. At most of the sites between this topmost one and the town of Wigan only minor coarse species were caught. This indicated a deterioration in the fish populations from several years ago when, at least at sites Do02 and Do03, populations of coarse fish were present (P. Glover pers comm.). The apparent loss of these populations may be due to a minor (and un-reported) fish kill occurring at these sites. Poor water quality in and around Wigan would effectively isolate areas of river above the town from any upstream movement of fish, with the result that there could be no restoration of fish stocks at sites Do02 and Do03, following any pollution incident, without restocking. It is recommended that the NRA restock at sites Do02 and Do03 with 1000 each of chub, dace and roach fry from the Leyland Hatchery and that their survival be monitored in the future.

Below the site Do03, the out fall from Horwich Waste Water Treatment Works enters the river. The discharge from this site is known to have a high ammonia content which may account for the poor fish populations downstream. The quality of this discharge is to be improved in the near future. Stocking above this out fall will allow the movement of coarse fish to areas downstream when water quality is suitable. A single roach was caught at site Do04, this was a fairly large specimen (length 270mm, weight 280g.) which, given the absence of any major coarse fish species in the sites above and below Do04, is likely to have been recently introduced.

The town of Wigan and its urban and industrialised areas encompass the sites Do07 through to Do13 inclusive. Here the river is shallow, often contains debris and other polluting matter, and has been subject to large amounts of flood defence work. It is not surprising that no major fish species were present at the majority of these sites. The exception to this was at site Do11, situated at the confluence with Poolstock Brook where a mixed coarse fish population of chub, pike, perch and eels were caught. This population is very likely to have originated from the large fish population found in Poolstock Brook. Sites below Do11 on the River Douglas returned to having no major coarse fish species present probably because of a deterioration in water quality. A barrier to any fish movement also exists in the Scholes area of Wigan Town centre.

Few coarse fish were caught on the River Douglas below Wigan until the weir at Gathurst. This weir is impassable to upstream migrating fish but has a beneficial effect on the water quality below it, acting as an aerator of the water. Populations of coarse fish were caught at all of the sites below Gathurst weir between Do16 and Do24 inclusive. This is likely to be due to a combination of the weir's beneficial effects on dissolved oxygen levels and also the nature of the river itself. Below the weir the river has more of a pool and riffle nature and the habitat appears to be that where one would expect to find populations of coarse fish.

The nature of the river at these sites below Gathurst weir is likely to result from its previous use as the Douglas Navigation (Section 2.2). However the habitat did make efficient sampling much more difficult than was the case upstream. Surveys were carried out using two hand held electrodes operated from a small boat which, because of the uneven depth and width of the river, caused sampling accuracy to be extremely erratic. It is believed that fish were evading capture by swimming around and under the effect of the anode rings in the deeper and wider areas of the sample site. The fish that were sampled were caught as a result of being driven towards the downstream stopnet and netted as they tried to return upstream. The data from these sites should be considered as a minimum estimate of the populations present.

The area of river below Gathurst weir contained the best coarse fish populations in the River Douglas. Unfortunately, a few weeks after the survey was undertaken, a combination of very warm weather followed by storms resulted in a large fish kill in the area from below Gathurst weir to Parbold, killing approximately 2000 fish. This area was subsequently been restocked with chub, dace and roach from the NRA Leyland Hatchery in winter 1995.

Below Parbold the River Douglas receives a major input of treated effluent from the Hoscarr STW, this input reduces the water quality to Class 3 and is likely to have a deleterious effect on the fish populations present. Accurate sampling at this site was made difficult by the river being very wide and, in some places very deep, despite using four anodes and the large electric fishing punt. A more effective sampling method for surveying rivers of this size would be to sample by rod and line fishing. However, other biases would appear in the findings and all species, sizes and age classes are unlikely to be represented.

The generally poor fish populations found in the minor tributaries of the River Douglas are likely to be due to poor water quality at these sites. This is especially true in Buckow, Bradley and Smithy Brook's. Although Pearl Brook contained no major coarse fish species five brown trout were caught, a pleasant surprise considering associated land use and water quality. The generally good coarse fish population in Poolstock Brook is most likely to have originated from the coarse fish populations in Scotsman's and Pearson's Flashes which flow into the Brook. Further movement of these fish is likely to have resulted in the fish population at the confluence of Poolstock Brook and the River Douglas. The River Tawd has for some years been prone to major pollution inputs, largely from the town of Skelmersdale, resulting in low water quality. Valuable work by the Pollution Control Function has now increased water quality in the River Tawd to a level where it is likely to support coarse fish (Class 2). The absence of populations in the River Tawd may simply be due to little influx of fish from the main river. It is suggested that the middle and upper reaches be stocked with 5000 each of chub and roach fry from the NRA hatchery at Leyland in 1996 and that the survival of these populations be monitored.

5.2 The River Yarrow

The fishery status of the River Yarrow is probably largely determined by the presence of the town of Chorley. This will generate diffuse and discrete pollution inputs, resulting in reductions in water quality and with a resulting effect on fish populations.

Brown trout were present from the top of the system to the site Yw06 with the exception of the topmost site at Blindhurst (Yw01). At this site low flows and organic enrichment produce a water quality classification inferred from the invertebrate fauna of Class 2. Below this site water quality is of class 1B and is capable of supporting brown trout. Though present in these sites, trout were not found in large numbers and the population may have originated from Yarrow Reservoir. No trout of length consistent with a 0+ age class were caught (the smallest being 145mm) suggesting that either successful spawning is erratic and that none occurred in 1995, or that the trout spawn elsewhere and migrate into the river as juveniles.

Populations of major coarse fish species were caught downstream of site Yw06. These consisted solely of gudgeon and a single pike until the site at Plymouth Bridge (Yw09) where chub, including previously panjetted individuals, were caught in addition to eel, trout and perch. Below these sites fish populations were very poor, consisting of gudgeon and a few chub, until the weir at Croston. This weir raises water quality from class 2 to class 1B, and results in a mixed coarse fish population surviving at the sites below. This coarse fish population at site Yw14, although classified as a D according to its absolute biomass in the NFCS was amongst the best when classified relative to other sites in the database of similar habitat type (Relative Classification A). Below this site fish populations decline again.

Water quality classification from invertebrate analysis suggests that the River Yarrow could support coarse fish populations along the whole of its length. The absence of these populations may be due to either a background level of polluting inputs or an historical pollution incident killing fish which were subsequently not replaced. The river receives treated effluent from two sewage works, at Chorley and at Croston, and also diffuse inputs from the town of Chorley and from riparian land use. These are likely to reduce water quality and have associated effects on the fish populations, although the work of the Pollution Control and Fisheries Functions have tended to minimise these where possible. These inputs may cause pollutant levels to rise, particularly that of ammonia which is highly toxic to fish but much less so to the invertebrates used in water quality classification. This can produce a stretch of river with a water quality classification of Class 2 but which is highly toxic to fish populations.

The study by Lambert and Walsingham in 1992, in which chub were stocked into the River Yarrow, did not document any problems with ammonia levels in the river. However, discharges may be erratic and may not coincide with routine water sampling times. If the Yarrow had historically suffered pollution which effectively removed its fish populations, these could only have been replaced by restocking or by upstream migration of fish from the population below Croston weir. This weir is likely to be impassable to all coarse fish species and only passable to migratory salmonids at certain river heights. It is recommended that the River Yarrow be restocked with juvenile coarse fish from Leyland fish farm and that the survival of these populations be carefully monitored. An initial stocking of 5,000 each of chub, dace and roach juveniles should be undertaken in 1996.

The tributaries of the River Yarrow around the town of Chorley (River Chor and Black Brook) are likely to be affected by polluting inputs from the town itself. Black Brook contains trout along with a small population of mixed coarse fish including gudgeon, roach and perch, although these may have originated from the lodges at the top of the brook. The survival of these fish is a very encouraging indication of the water quality. The River Chor is also of water quality Class 2 but contained no fish at the site sampled, possibly indicating a recurring pollution problem.

Culbeck Brook contained few fish species except eels. This result produces a good Absolute Classification for coarse fish (Class B) because of their high biomass per 100m², but a poor Relative Classification (Class E) because eels are excluded from the analysis. Stocking the main River Yarrow with coarse fish from the Leyland Hatchery would allow their migration into this and other side becks should water quality be sufficient to allow survival.

Syd Brook runs between a road and farmland and so would be expected to receive diffuse polluting inputs from both. This probably explains the paucity of its fish stocks. In July 1995, after this survey was undertaken, Syd Brook received an input of farm pollution which killed an estimated 3500 eels, brown trout, flounder, roach, dace, chub as well as minor coarse fish species in both the brook and the River Yarrow. Following this incident, this brook should be considered for restocking with brown trout if water quality data indicates that they would survive.

5.3 The River Lostock

The distribution of fish in the River Lostock is affected most dramatically by the impassable weir at Farrington. Below this weir coarse fish densities and biomasses are among the highest within the Douglas system. This is in spite of the river passing through housing and industrial estates, and receiving treated effluent from Leyland Sewage Treatment Works. There is also anecdotal evidence of salmon and sea trout entering into the lower reaches of the river in 1995 (R. Taylor pers. comm.). The existence of this mixed coarse fish population can be attributed to the hard work of the NRA Pollution Control Function in maintaining a high standard of water quality, and to restocking from the NRA Leyland Coarse Fish Hatchery. The River Lostock below the weir at Farrington is an example of how a mixed coarse fish population can be established in an urban and industrialised area, and should be a model for the whole Douglas catchment.

Above the weir at Farrington, populations of major coarse fish species are virtually absent with the exception of some areas containing gudgeon and roach within Cuerden Valley Park. Although the area above the weir is subject to some polluting inputs from major road system developments and industrial estates, water quality is of class 1B and should be capable of supporting salmonid as well as coarse fish species. The absence of any major fish populations in this area above the weir can be attributed to the weir itself preventing any movement of fish from downstream. This area above the weir should be considered for stocking with coarse fish from the Leyland Hatchery. If sufficient money is available, a fish pass should be constructed at Farrington weir. This will allow movement of fish populations between the two areas including any salmon and migratory trout that may enter the river. The upper reaches of the Lostock could then be considered as areas for stocking with salmonids, initially with sea trout juveniles. Introductions of both coarse and salmonid species should be closely monitored following stocking.

Carr brook in the upper reaches of the River Lostock has a water quality classification implied from the invertebrate fauna of 1B, capable of supporting both coarse and salmonid species. The absence of fish in this brook is likely to be due to its isolation from the fish stocks of the river below Farrington weir. Stocking of the main river above Farrington weir will allow movement of fish into this brook should water quality and habitat availability be adequate.

Bannister and Buckshaw brooks contained very poor fish populations. This is not surprising considering that they pass through the town of Leyland and are therefore subject to diffuse pollution inputs. Wymott and Emnie brooks were found to contain reasonable fish populations most likely as a result of movement of fish from the population in the main river.

5.4 Stocking experiments

5.4.1 Movement and survival

Results from the stocking experiment undertaken in 1995 suggest that the survival of hatchery reared fish into the River Lostock was reasonably high. A total of 76 marked chub were recovered from the 2800 introduced in 1995 (2.7%), compared with 25 from the 3008 (0.8%) stocked into the River Yarrow in 1992.

Although the percentage returns in 1995 appear very low, it should be remembered that marked chub were dispersed along a total river length of 4.35 km and that only 10 sites of 50 metre length were surveyed in this area. These sites were also not equally dispersed throughout this river length. The three sites chosen for stocking were surveyed fully quantitatively with two survey sites within 300 metres of each other at each stocking site. The remaining four sites were sampled semi quantitatively, a less efficient fishing method. These semi quantitative sites included areas where a large number of marked chub were recaptured (45 marked fish were caught at the sites Lk09, Lk10, and Lk11). We would expect a higher number of marked fish to be caught if these sites had been surveyed fully quantitatively. Considering the river length and the sampling strategy it is not thought unreasonable to expect an overall survival of stocked fish well in excess of 30%.

The stocking experiment also indicates that fish stocked from a hatchery pond are able to move large distances when introduced into a river in order to find sufficient food and habitat. In the 3 months following their introduction the fish had managed to migrate distances as far as 4 km. Further migration through the river system is likely to only be limited by the presence of the weir at Farrington.

The presence of marked chub in the River Yarrow from the 1993 stocking experiment suggests a good retention of the alcian blue panjet mark. This is evidence that few panjet marks in the 1995 experiment would have faded during the period between stocking and surveying. The two chub marked on the pelvic fin that were recaptured at Plymouth bridge appear to suggest a long upstream movement of these fish (approximately 12km) from their original stocking site below the major weir at Croston. However, it is likely that these fish were planted above the weir by anglers as the weir is a barrier to migration of coarse fish.

5.4.2 Effects on resident fish populations

The introduction of chub increased both the overall numbers and biomasses of fish at each of the six sites surveyed quantitatively (see Table 5). Values for these parameters were increased by up to 400% following stocking, even in areas previously well stocked with fish. Absolute and Relative Classifications from the National Fisheries Classification Scheme were also increased or remained the same compared to the situation prior to chub introduction.

Numbers and biomasses of chub were significantly increased at all of the sites except Lk07 and Lk08. This suggests that, in general, stocking was successful in increasing the resident chub populations. The sites Lk07 and Lk08 were found to contain very high chub populations prior to the stocking study and may have been close to the carrying capacity for this species in the habitat available. If this were the case we would not expect the chub populations to rise significantly at these sites following the introduction of more chub.

Although overall numbers and biomasses of fish per 100 m² were increased at all sites following chub introductions, population composition altered at some of the sites surveyed. Dace were no longer caught during the summer survey at sites Lk07, Lk08 and Lk15 and roach populations increased at all sites where they were present in the spring of 1995 (all sites except Lk16). The loss of dace may be due to competition with the resident and introduced chub populations for food and suitable habitat (both chub and dace are rheophilic species). However, these changes in population composition may be unrelated to the introduction of chub but instead may be due to natural seasonal movements of fish in search of food, habitat or spawning areas.

6. CONCLUSION

The coarse fish populations of the River Douglas system vary widely between sites. Areas of good, poor and average coarse fish abundances are present, though the majority are poor and average populations. There are also areas above the urban and industrialised areas, near the headwaters, that contain stocks of brown trout. The poor and average coarse fish populations are indicative of a river system recovering from decades of industrial and urban pollution. Discreet and diffuse pollution incidents are likely to continue for some years to come though with the continued vigilance of both the Agency, a more environmentally aware general public, and the angling fraternity, this situation is likely to improve.

In the areas of improving water quality identified in this report rapid improvement in fish populations can be elicited by restocking with coarse fish from the NRA Leyland Hatchery. The weir at Farrington has also been identified as a suitable site for the construction of a fish pass. This will open up the upper reaches of the catchment and may allow migratory salmonids to colonise suitable areas.

7. REFERENCES

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Appendix 1

Length Weight relationships

In the course of surveying the River Douglas System, the lengths and weights of fish caught were recorded. This information can be used to determine a relationship between these parameters.

The relationship between length (L) and weight (W) of a fish typically takes the form:

$$W = aL^b$$

or in the linear form:

$$\log W = \log a + b \log L$$

where a and b are constants estimated from regression analysis. This regression analysis of lengths and weight from four fish species are shown in Table 7. Insufficient numbers of fish from other species were caught to perform adequate analysis on these species.

Table 7. Regression analysis of length - weight data.

Species	log a	b	Correlation Coefficient (r)	Sample number
Chub	-5.153	3.128	0.992	300
Dace	-4.585	2.843	0.975	101
Roach	-5.152	3.162	0.989	100
Eel	-5.786	3.031	0.926	191

Analysis of the fish length - weight data from the River Douglas indicates a very strong relationship between the two parameters for each of the species examined. The correlation coefficient (r) is a measure of how strong this relationship is, in effect how far the points plotted on a graph would deviate from a straight line. The closer the correlation coefficient is to a value of 1.0 then the greater the correlation between the two variables. In the case of the four fish species studied from the Douglas system, all of the r values calculated were greater than 0.9 suggesting a very strong correlation between length and weight (p > 0.001 for each species studied). The correlation between length and weight allows the weight of a fish to be inferred from its length. Inferred weights can then be used to calculate the biomass of fish present at a site.

During development fish typically pass through several growth stages or stanzas, for example passing from fry to parr in trout. Each stanza may have its own length - weight relationship. The two coefficients, a and b, will vary between species and also between stocks of the same species. For this study the regression was performed on the whole population samples during the surveys.

Within any stanza the regression coefficient, b, is often nearly constant throughout the year, or a series of different environments. Changes to the value of b occur between stanzas, at metamorphosis, at first maturity, and with major environmental changes. If the fish retains the same shape as it grows, isometric growth, the value of b will be 3.0. A value larger or smaller than 3.0 indicates that the fish is heavier or lighter for its length, allometric growth. The values of b generated for all species except dace were greater than 3.0 suggesting that the weight of the fish was greater than might be expected from the lengths. In the case of dace, the value of b was less than 3.0, suggesting a lower weight for length of fish.

The value of log a is the intercept of the line on the Y axis (log weight), this will often vary seasonally, with time of day, and between habitats.

The benefit of these regression equations is that the values generated from them can be compared for populations of fish between or within rivers to determine how well the fish are growing and to decide whether management action is needed.

Appendix 2.

Site Summaries

River Douglas & Tributaries			
Site Code	Watercourse	Location	N.G.R.
Do01	River Douglas	Horwich	SD 636 125
Do02	River Douglas	Downstream Rivington	SD 630 117
Do03	River Douglas	Upstm Horwich WWTW	SD 623 111
Do04	River Douglas	Grimeford Bridge	SD 613 123
Do05	River Douglas	Below Pincroft Bridge	SD 603 125
Do06	River Douglas	Addlington Ford	SD 594 119
Do07	River Douglas	Red Rock Garden Centre	SD 579 098
Do08	River Douglas	Wingate Lane	SD 585 085
Do09	River Douglas	Coppull Lane	SD 588 067
Do10	River Douglas	Corporation Street	SD 579 048
Do11	River Douglas	Below Poolstock Brook	SD 573 051
Do12	River Douglas	Robin Park	SD 566 062
Do13	River Douglas	Wigan Lower Ground	SD 560 070
Do14	River Douglas	Below Gathurst Bridge	SD 538 070
Do15	River Douglas	Below Motorway Bridge	SD 534 074
Do16	River Douglas	Forest Fold Farm	SD 527 084
Do17	River Douglas	Upstream Appley Bridge	SD 527 091
Do18	River Douglas	Appley Bridge	SD 524 093
Do19	River Douglas	Appley locks	SD 516 095
Do20	River Douglas	D/S Appley Bridge	SD 513 097
Do21	River Douglas	Parbold Hall	SD 506 100
Do22	River Douglas	Parbold	SD 498 101
Do23	River Douglas	Under Leeds/Hivesport Canal	SD 489 104
Do24	River Douglas	Grinstaw Green	SD 484 121

River Douglas & Tributaries			
Site Code	Watercourse	Location	N.G.R.
Do25	River Douglas	Snipe Hall	SD 476 127
Do26	River Douglas	Below Townsends Farm	SD 473 138
Do27	River Douglas	Rufford Bridge	SD 467 157
Pe01	Pearl Brook	Above STW	SD 628 108
Bu01	Buckow Brook	Adlington Hallfarm	SD 582 120
Bd01	Bradley Brook	Above Standish Works	SD 578 102
Po01	Poolstock Brook	Below Flashes	SD 578 043
Po02	Poolstock Brook	Upstream River Douglas	SD 574 048
Sm01	Smithey Brook	Lamberhead Green	SD 544 042
Sm02	Smithey Brook	Duke Street	SD 571 046
Td01	River Tawd	Fishtons	SD 478 083
Td02	River Tawd	Hoscar	SD 474 117
El01	Eller Beck	Prescott Bridge	SD 462 137
River Yarrow & Tributaries			
Yw01	River Yarrow	Blindhurst Bridge	SD 615 151
Yw02	River Yarrow	Limbrick	SD 602 163
Yw03	River Yarrow	Near Dunbury Park	SD 596 156
Yw04	River Yarrow	Above Black Brook	SD 594 164
Yw05	River Yarrow	Below Black Brook	SD 592 162
Yw06	River Yarrow	Opp. Dunbury Park Club House	SD 588 156
Yw07	River Yarrow	Grundys Lane	SD 581 143
Yw08	River Yarrow	Birkacre	SD 571 153
Yw09	River Yarrow	Plymouth Bridge	SD 568 159
Yw10	River Yarrow	Upstream of STW	SD 565 173
Yw11	River Yarrow	Pincóck Bridge	SD 556 178
Yw12	River Yarrow	Downstream of M6	SD 544 179
Yw13	River Yarrow	Eccleston Bridge	SD 514 178

River Yarrow & Tributaries			
Site Code	Watercourse	Location	N.G.R.
Yw14	River Yarrow	Below Croston Weir	SD 498 179
Yw15	River Yarrow	Below Croston STW	SD 480 186
Bb01	Black Brook	U/s mbl	SD 598 185
Bb02	Black Brook	D/s Hospital	SD 597 174
Bb03	Black Brook	Above River Yarrow	SD 593 164
Ch01	River Chor	Opposite college	SD 570 176
Cu01	Culbeck Brook	O/s Euxton	SD 538 188
Sy01	Syd Brook	Eccleston	SD 521 164
Sy02	Syd Brook	Syd Brook Hall farm	SD 502 176
River Lostock & Tributaries			
Site Code	Watercourse	Location	N.G.R.
Lk01	River Lostock	Lower Cop Thirst	SD 593 215
Lk02	River Lostock	Cuerden Valley Park	SD 577 213
Lk03	River Lostock	Sheep Mill Lane	SD 568 231
Lk04	River Lostock	Cuerden Valley Park	SD 568 241
Lk05	River Lostock	Todd Lane South	SD 555 254
Lk06	River Lostock	Fowler Bridge	SD 540 248
Lk07	River Lostock	Above Farrington Bridge	SD 540 248
Lk08	River Lostock	Below Farrington Bridge	SD 535 233
Lk09	River Lostock	Earnshaw Bridge	SD 529 228
Lk10	River Lostock	Dunkirk Pub	SD 529 219
Lk11	River Lostock	Wade Hall	SD 524 211
Lk12	River Lostock	Above STW outfall	SD 522 208
Lk13	River Lostock	Below STW outfall	SD 522 206
Lk14	River Lostock	Johnson House farm	SD 517 200
Lk15	River Lostock	Lostock Bridge farm	SD 513 199
Lk16	River Lostock	Above Ulnes Walton Brg	SD 512 199

River Lostock & Tributaries			
Site Code	Watercourse	Location	N.G.R.
Lk17	River Lostock	Lostock Bridge	SD 508 198
Lk18	River Lostock	Croston Bridge	SD 486 196
Cr01	Carr Beck	<i>Clayton-le-Woods</i>	SD 580 228
<i>B^o/01</i>	Bannister Brook	Leyland Printing Co.	SD 528 217
<i>B^s/01</i>	Buckshaw Beck	Wade Hall	SD 539 206
Em01	Emmie Brook	<i>Emmie site</i>	SD 524 214
Wy01	Wymott Beck	<i>Hm Prison</i>	SD 498 213
Wy02	Wymott Beck	Above River Lostock	SD 488 197
Pre Stocking Survey			
Lk07	River Lostock	Above Farrington Bridge	SD 540 248
Lk08	River Lostock	Below Farrington Bridge	SD 535 233
Lk12	River Lostock	Above STW outfall	SD 522 208
Lk13	River Lostock	Below STW outfall	SD 522 206
Lk15	River Lostock	<i>Lostock Bridge farm</i>	SD 513 199
Lk16	River Lostock	Above Ulnes Walton Bg	SD 512 199

Appendix 3.

Site survey information

3A. River Douglas and Tributaries

SITE REPORT

Site details

Watercourse: River Douglas

Site code: Do01

River System: River Douglas

Date fished: 19.06.95

Location: Horwich

N.G.R. SD 636 125

Habitat features

Length (m): 50

Mean width (m): 2

Area (m²): 100

Mean depth (m): 0.2

Gradient (m/Km): 28.5

Max. depth (m): 0.3

Water level: low summer flow

Site description: 40% Pool 20% Glide 40% Riffle

Adjacent land use: Parkland

Method: Upstream electric fishing, 1 anode, pulsed DC. (50V), wading, upstream stopnet.

Fishery Classification (level 3)

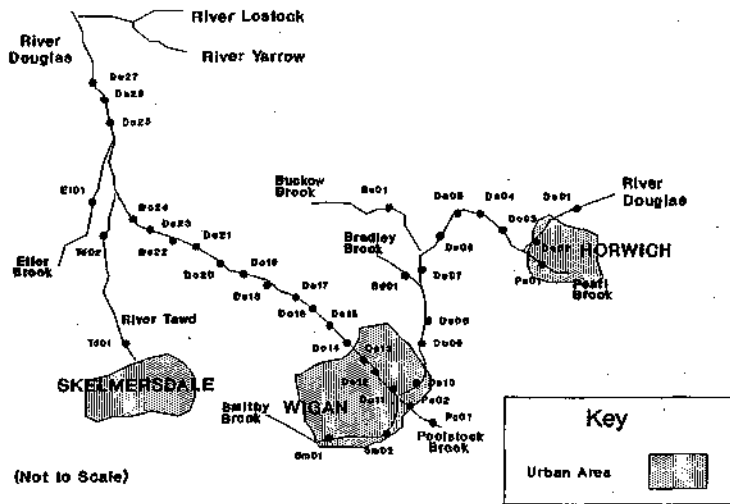
	Absolute Classification	Relative Classification
Salmonids	C	d
Coarse	F	e

Comments

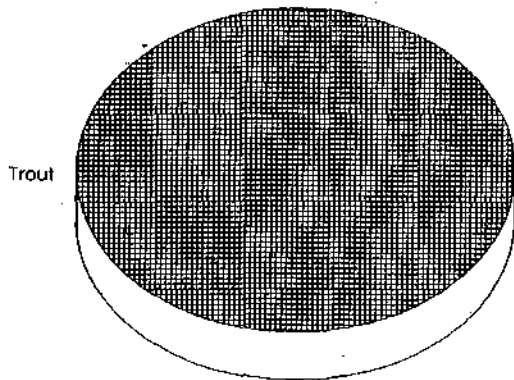
Forty three trout of lengths 70 mm to 220 mm were caught at this site.

Do01 NGR. SD 636 125

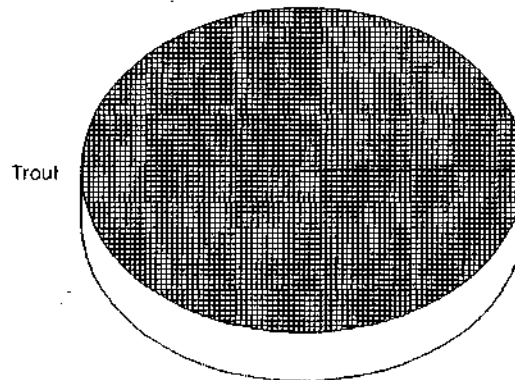
The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Daoc	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	43.00	1294.00
Total	43.00	1294.00



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: River Douglas Site code: Do02
River System: River Douglas Date fished: 14.06.95
Location: Downstream Rivington WWTW N.G.R. SD 630 117

Habitat features

Length (m): 50 Mean width (m): 2
Area (m²): 100 Mean depth (m): 0.3
Gradient (m/Km): 4.4 Max. depth (m): 0.5

Water level: low summer flow

Site description: 10% Pool 40% Glide 50% Riffle

Adjacent land use: Parkland

Method: Upstream electric fishing, 2 anodes, pulsed DC. (50V), wading, upstream stopnet.

Fishery Classification (level 3)

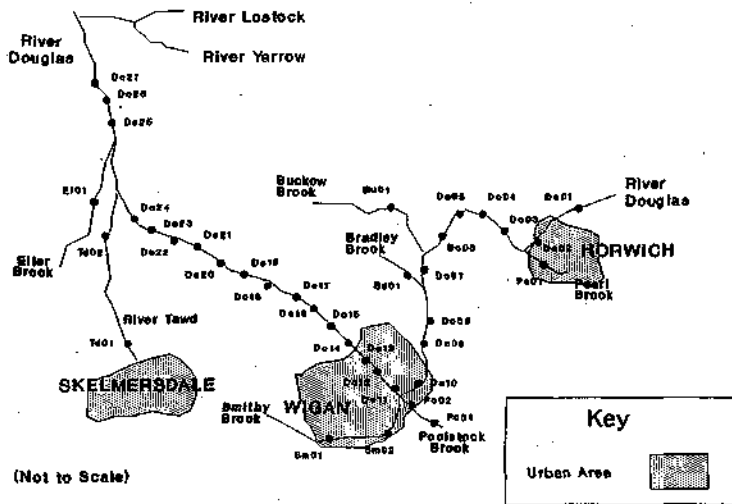
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	F	e

Comments

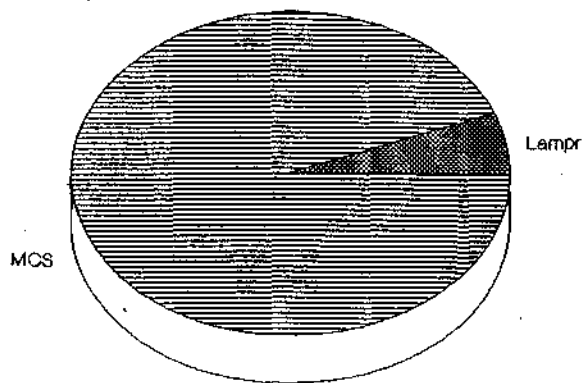
Bullhead, stickleback and a single lamprey were caught at this site.

Do02 NGR. SD 630 117

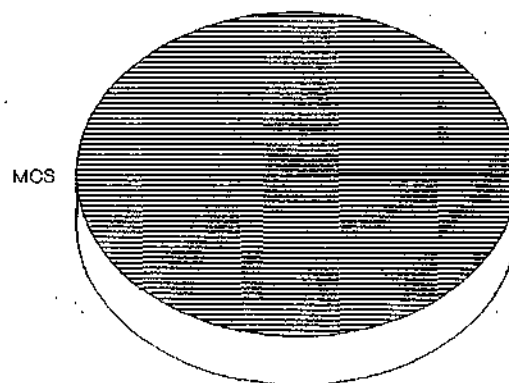
The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Rosch	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	1.00	?
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	16.00	65.00
Trout	0	0
Total	16.00	65.00



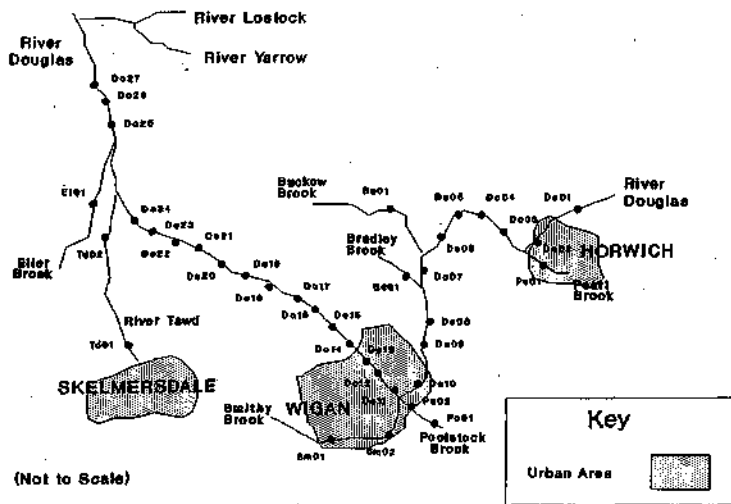
Population composition.



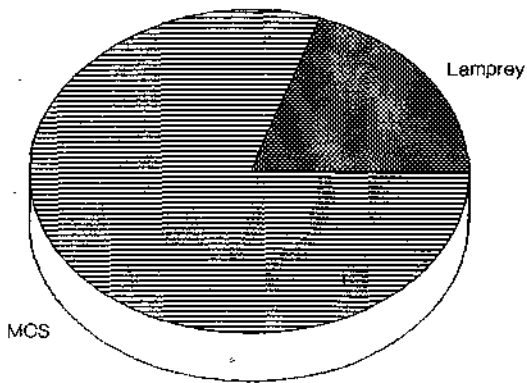
Biomass composition.

Do03 NGR. SD 623 111

The River Douglas System.



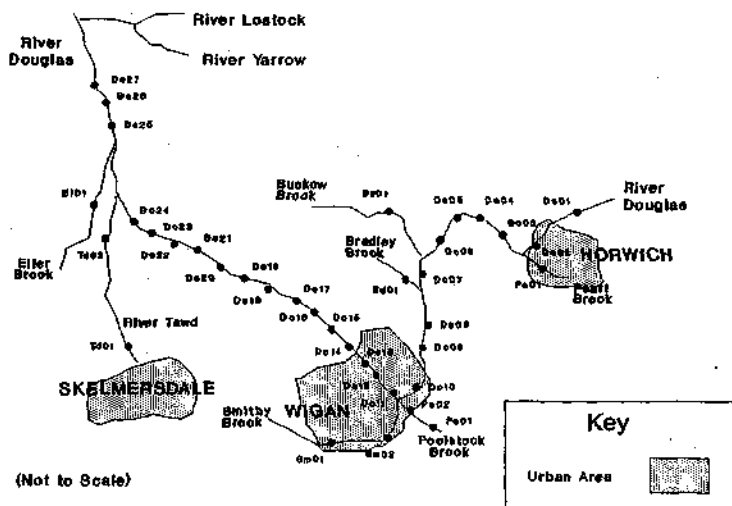
Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	1.33	?
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	5.33	?
Trout	0	0
Total	6.66	0



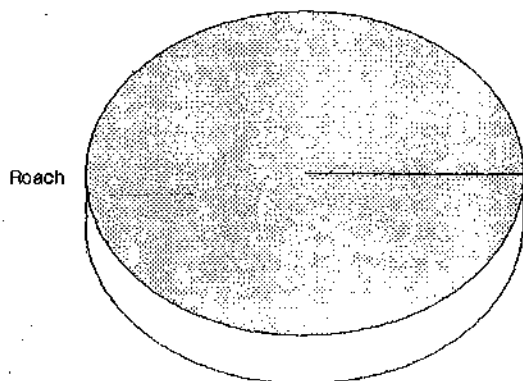
Population composition.

Do04 NGR. SD 613 123

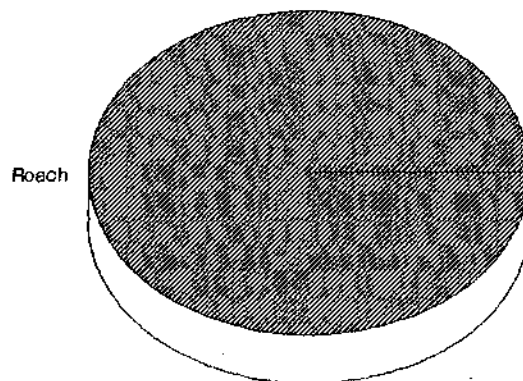
The River Douglas System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0.50	140.00
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coaræe Sp. (MCS)	0	0
Trout	0	0
Total	0.50	140.00



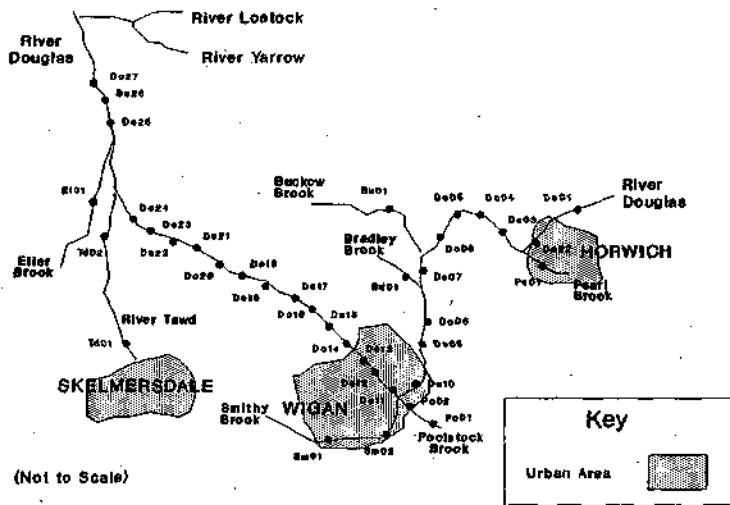
Population composition.



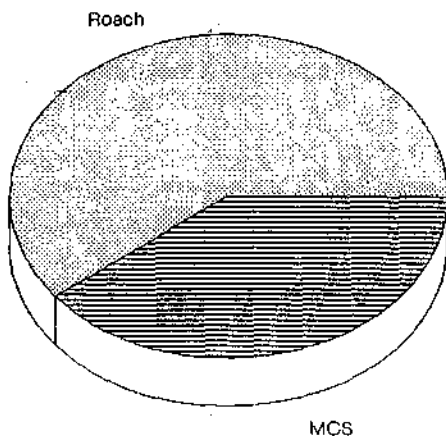
Biomass composition.

Do05 NGR. SD 603 125

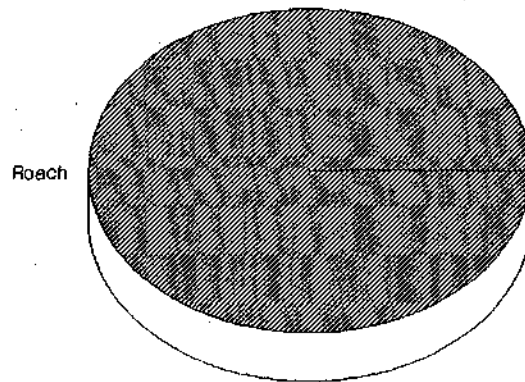
The River Douglas System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	2.00	2.00*
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	1.30	?
Trout	0	0
Total	3.30	2.00*



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: River Douglas	Site code: Do06
River System: River Douglas	Date fished: 14.06.95
Location: Addlington Ford	N.G.R. SD 594 119

Habitat features

Length (m):	50	Mean width (m):	6.0
Area (m ²):	300	Mean depth (m):	0.3
Gradient (m/Km):	4.0	Max. depth (m):	0.6
Water level:	low summer flow		
Site description:	00% Pool 70% Glide 30% Riffle		
Adjacent land use:	Farmland		

Method : Upstream electric fishing, 2 anodes, pulsed DC. (50V), wading, upstream stopnet.

Fishery Classification (level 3)

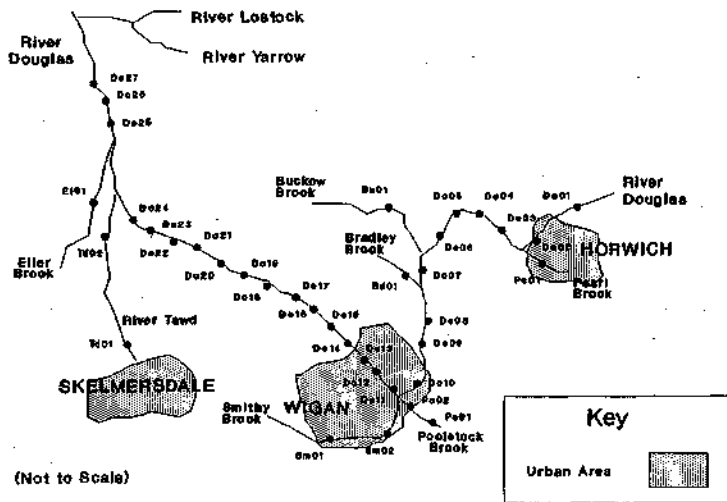
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	F	e

Comments

No fish were caught at this site.

Do07 NGR. SD 579 098

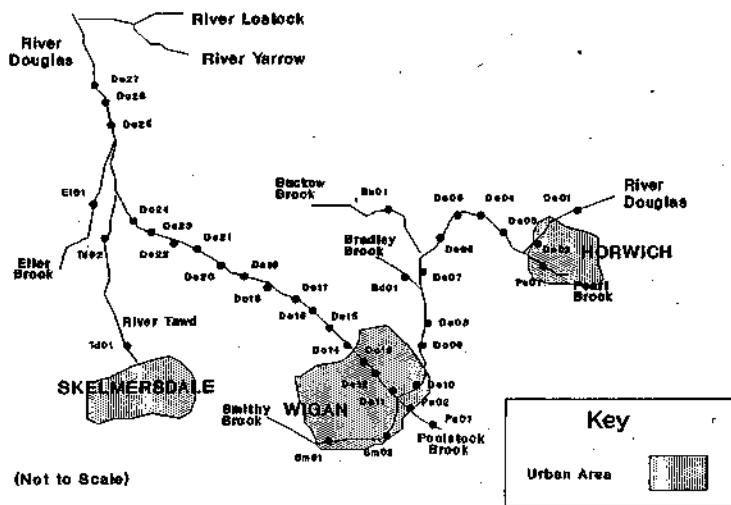
The River Douglas System.



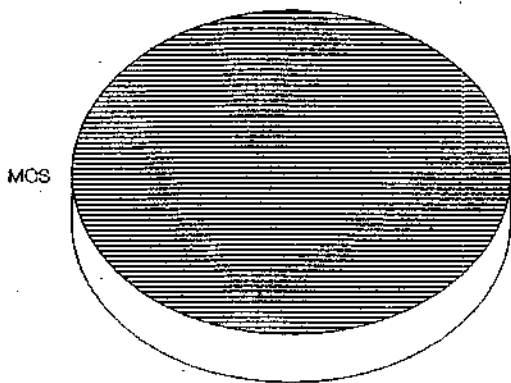
Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Paroh	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	0	0

Do08 NGR. SD 585 085

The River Douglas System.



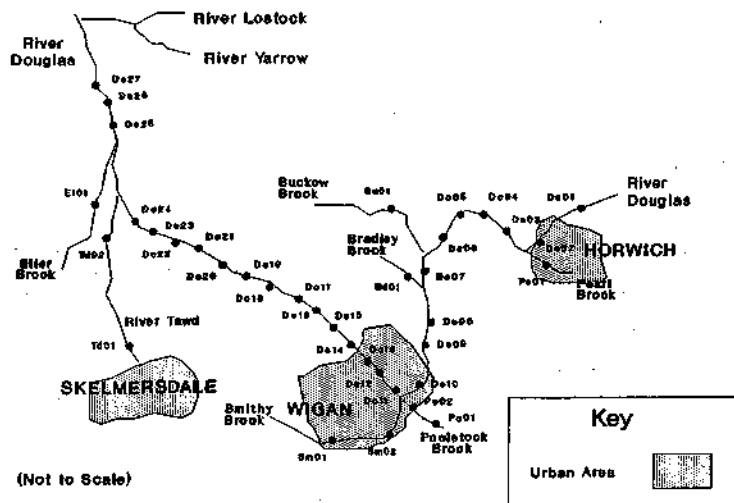
Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0.66	?
Trout	0	0
Total	0.66	0



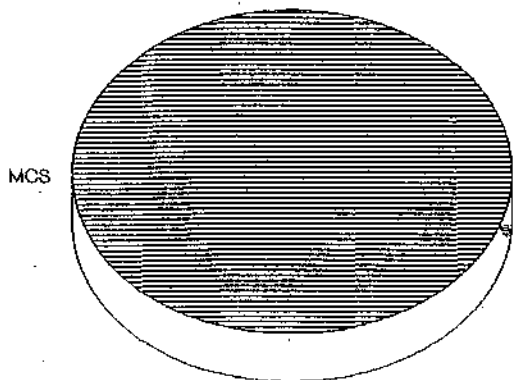
Population composition.

Do09 NGR. SD 588 067

The River Douglas System.



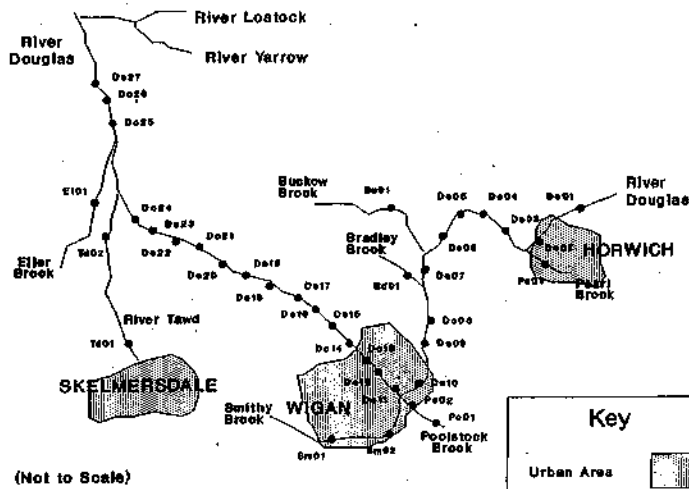
Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0.50	?
Trout	0	0
Total	0.50	0



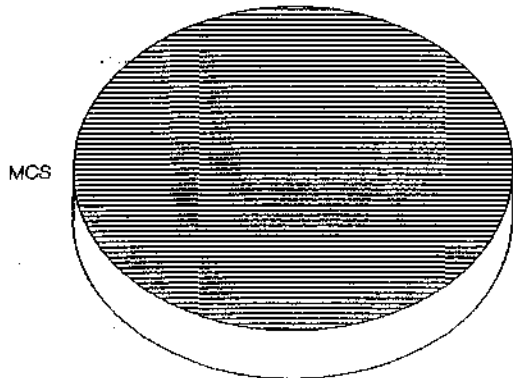
Population composition.

Do10 NGR. SD 579 048

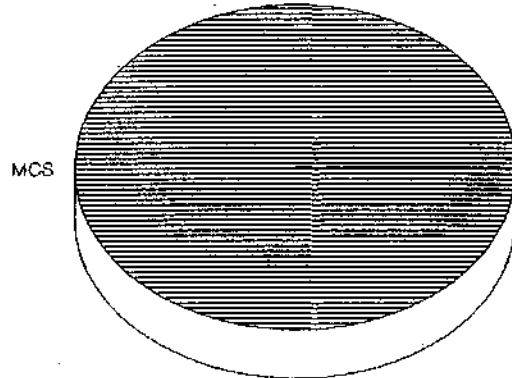
The River Douglas System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Founder	0	0
Minor Coaræ Sp. (MCS)	21.70	43.7
Trout	0	0
Total	21.7	43.7



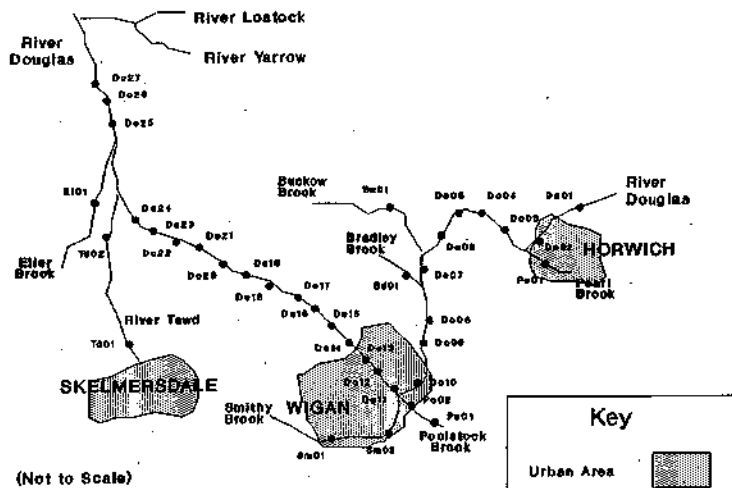
Population composition.



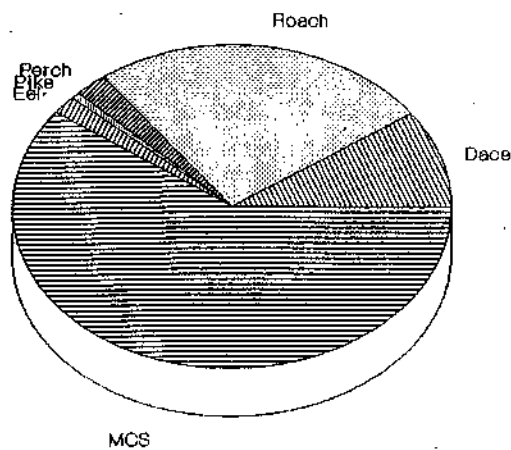
Biomass composition.

Do11 NGR. SD 573 051

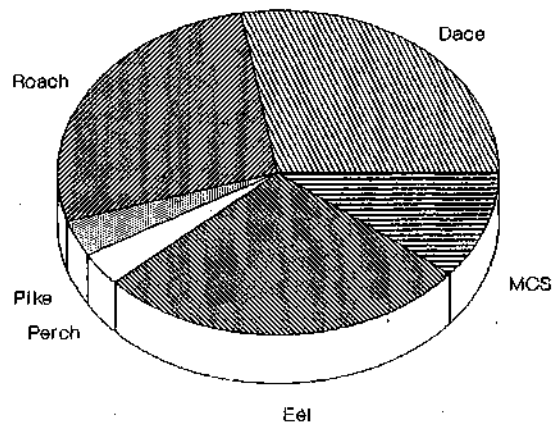
The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	3.20	149.60
Roach	8.20	146.20
Perch	0.80	18.00
Pike	0.20	20.00
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0.60	146.00
Flounder	0	0
Minor Coarse Sp. (MCS)	19.60	58.80
Trout	0	0
Total	32.60	540.80



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: River Douglas	Site code: Do12
River System: River Douglas	Date fished: 15.06.95
Location: Beside Robin Park	N.G.R. SD 566 062

Habitat features

Length (m):	50	Mean width (m):	11.0
Area (m ²):	550	Mean depth (m):	0.75
Gradient (m/Km):	0.8	Max. depth (m):	1.3

Water level: low summer flow

Site description: 20% Pool 80% Glide 00% Riffle

Adjacent land use: Urban area

Method : Upstream electric fishing, 2 anodes, pulsed DC. (50V), wading, upstream stopnet.

Fishery Classification (level 3)

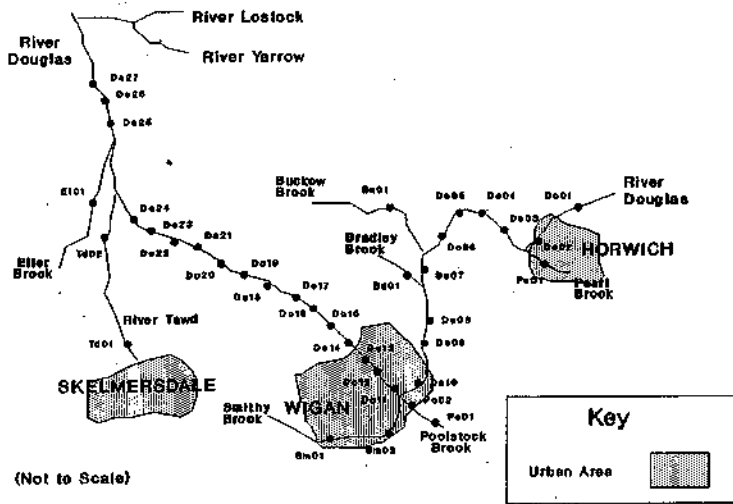
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	E	e

Comments

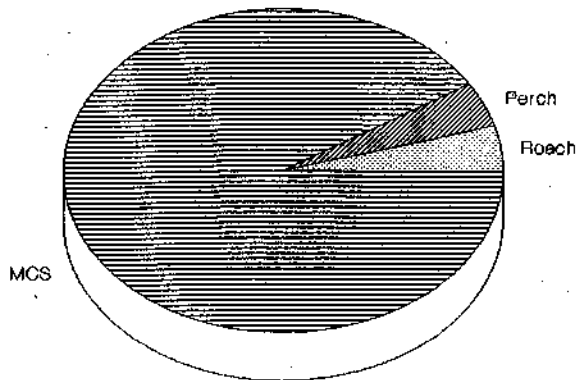
A single perch and roach and sticklebacks were found at this site.

Do12 NGR. SD 566 062

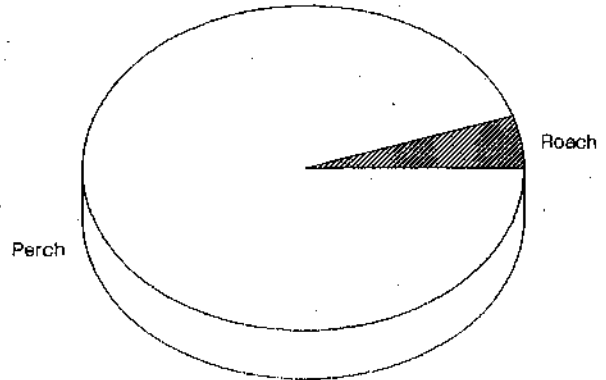
The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0.18	1.00*
Perch	0.18	18.20*
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	3.60	7
Trout	0	0
Total	3.96	19.20



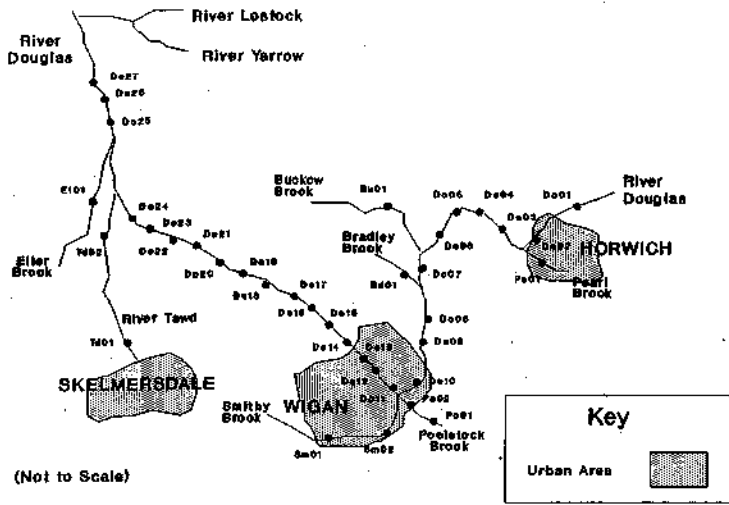
Population composition.



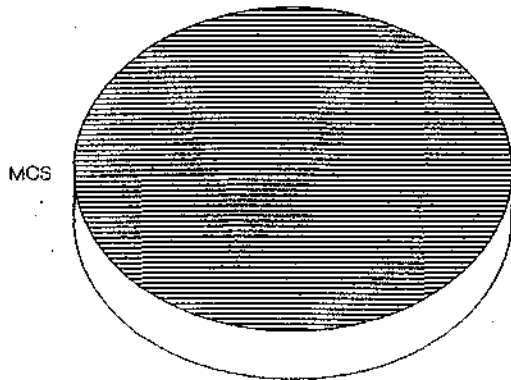
Biomass composition.

Do13 NGR. SD 560 070

The River Douglas System.



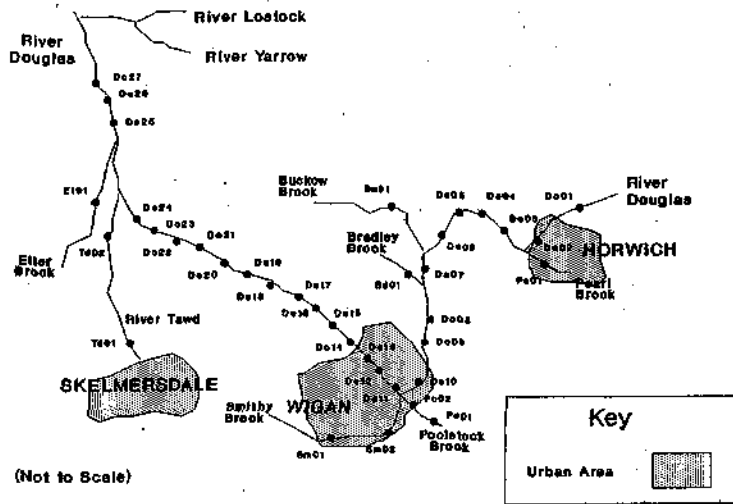
Species	Density (N/100m ²)	Biomass (g/100m ²)
Gtub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coaræe Sp. (MCS)	0.66	0
Trout	0	0
Total	0.66	0



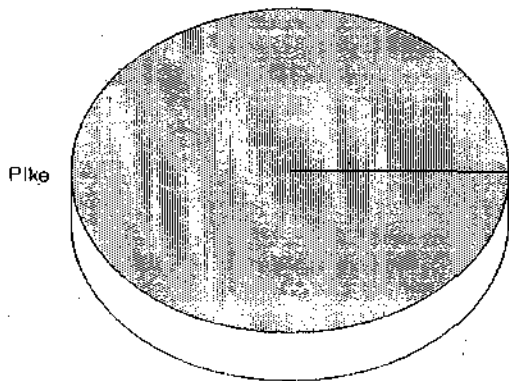
Population composition.

Do14 NGR. SD 538 070

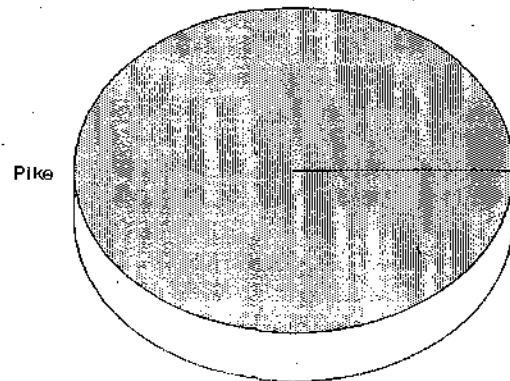
The River Douglas System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0.05	46.50
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	0.05	46.50



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: River Douglas Site code: Do15
River System: River Douglas Date fished: 31.05.95
Location: Downstream Motorway Bridge N.G.R. SD 534 074

Habitat features

Length (m): 250 Mean width (m): 10.0
Area (m²): 2500 Mean depth (m): 2.0
Gradient (m/Km): 0.8 Max. depth (m): 3.0

Water level: low summer flow

Site description: 00% Pool 100% Glide 00% Riffle

Adjacent land use: Farmland

Method : Two anodes, pulsed DC (250V), operated from a punt, drifting downstream to a stopnet.

Fishery Classification (level 3)

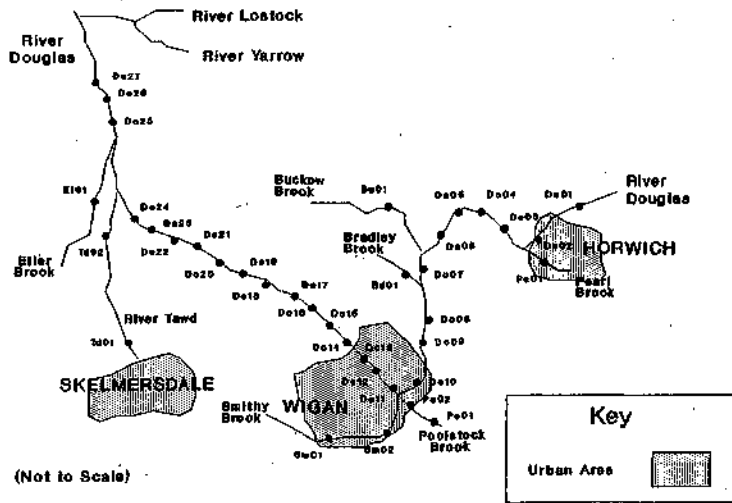
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	F	e

Comments

No fish were caught at this site.

Do15 NGR. SD 534 074

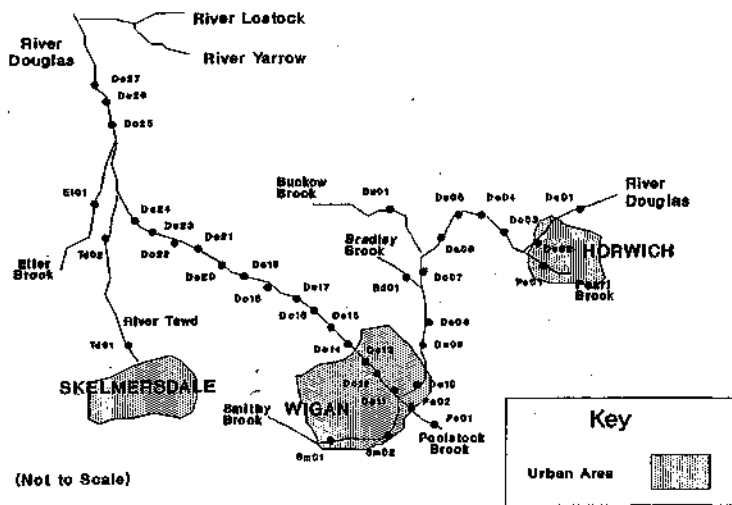
The River Douglas System.



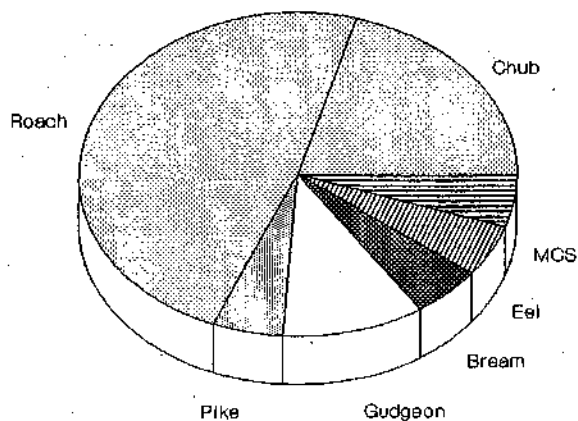
Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	0	0

Do17 NGR. SD 527 091

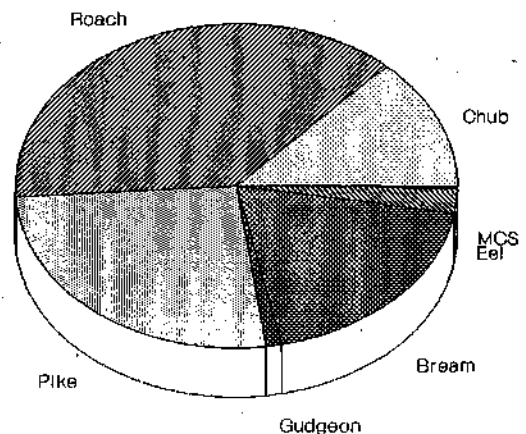
The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0.16	20.90
Dace	0	0
Roach	0.37	60.50
Perch	0	0
Pike	0.04	41.60
Gudgeon	0.08	1.80
Bream	0.04	30.40
Tench	0	0
Lamprey	0	0
Eel	0.04	4.04
Flounder	0	0
Minor Coarse Sp. (MCS)	0.04	0.20
Trout	0	0
Total	0.77	159.44



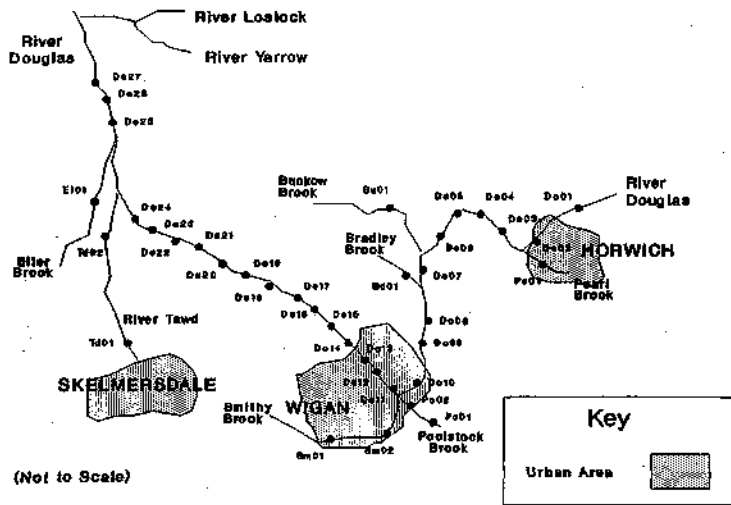
Population composition.



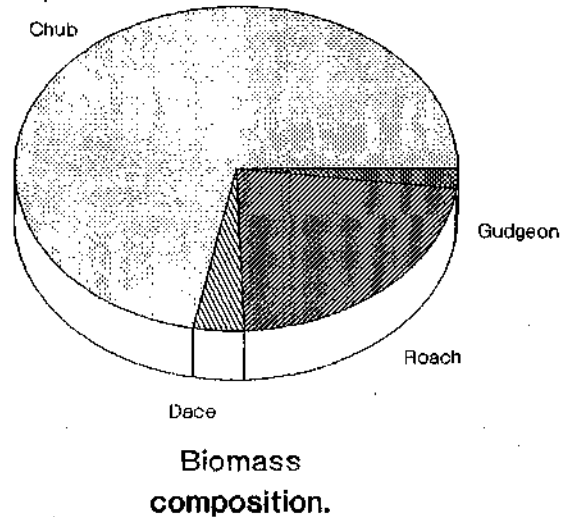
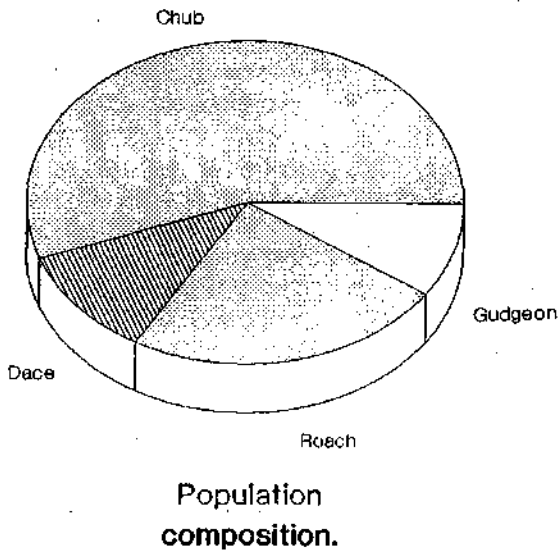
Biomass composition.

Do18 NGR. SD 524 093

The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	2.92	455.30*
Dace	0.58	25.33*
Roach	1.26	141.75*
Perch	0	0
Pike	0	0
Gudgeon	0.50	12.50*
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	?
Trout	0	0
Total	5.26	632.88



SITE REPORT

Site details

Watercourse: River Douglas	Site code: Do19
River System: River Douglas	Date fished: 23.05.95
Location: Appley Locks	N.G.R. SD 516 095

Habitat features

Length (m): 200	Mean width (m): 5.0
Area (m ²): 1000	Mean depth (m): 1.5
Gradient (m/Km): 0.8	Max. depth (m): 2.5
Water level: low summer flow	
Site description: 00% Pool 100% Glide 00% Riffle	
Adjacent land use: Farmland	

Method : Four anodes, pulsed DC (200V), operated from a punt, drifting downstream to a stopnet.

Fishery Classification (level 3)

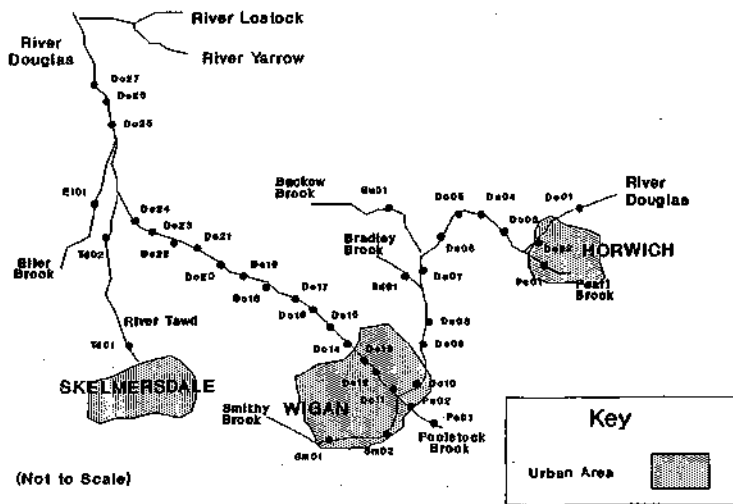
	Absolute Classification	Relative Classification
Salmonids	E	e
Coarse	D	d

Comments

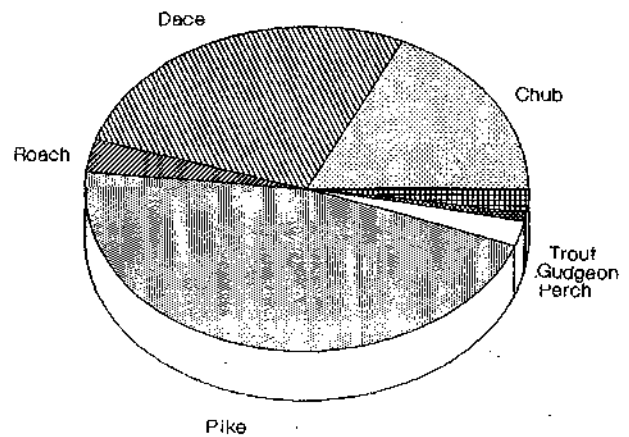
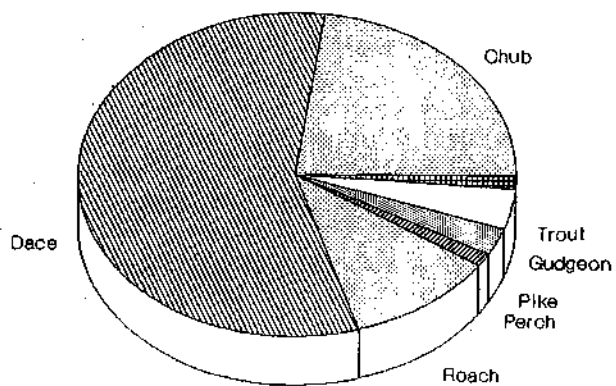
A mixed coarse fish population of chub, roach, dace, pike, perch, gudgeon and a single brown trout was caught at this site

Do19 NGR. SD 516 095

The River Douglas System.

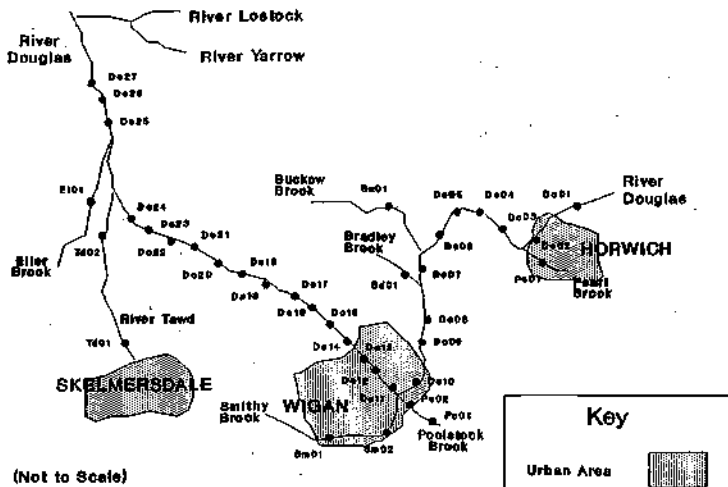


Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	1.70	109.30
Dace	4.20	164.60
Roach	0.80	20.10
Perch	0.10	15.50
Pike	0.20	280.00+
Gudgeon	0.30	5.10
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0.10	14.20
Total	7.40	606.60

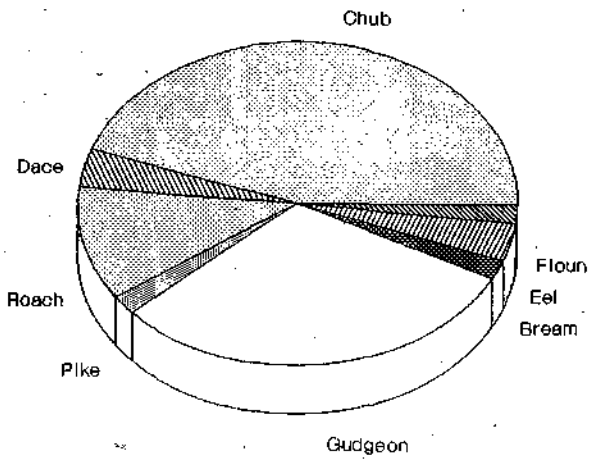


Do20 NGR. SD 513 097

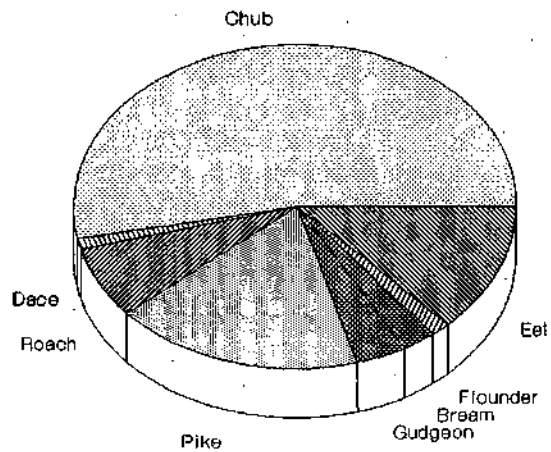
The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	2.66	455.70
Dace	0.22	9.55
Roach	0.66	61.66
Perch	0	0
Pike	0.11	164.40
Gudgeon	1.78	31.77
Bream	0.11	22.22
Tench	0	0
Carp	0	0
Eel	0.22	11.11
Flounder	0.11	12.22
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	5.77	858.83



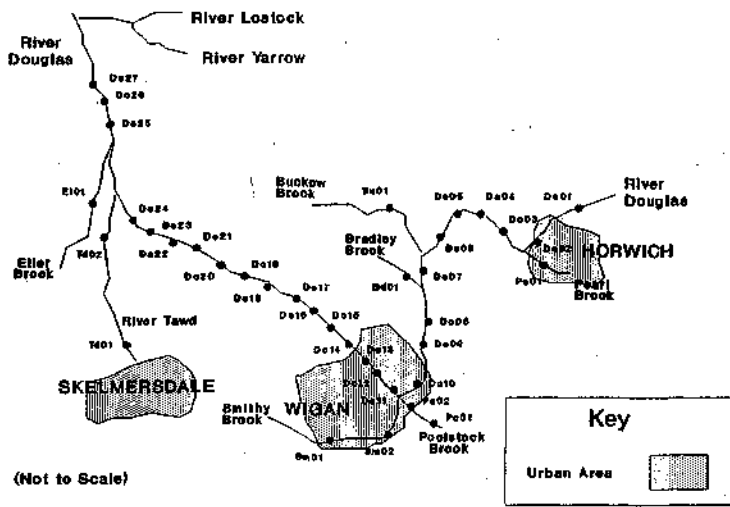
Population composition.



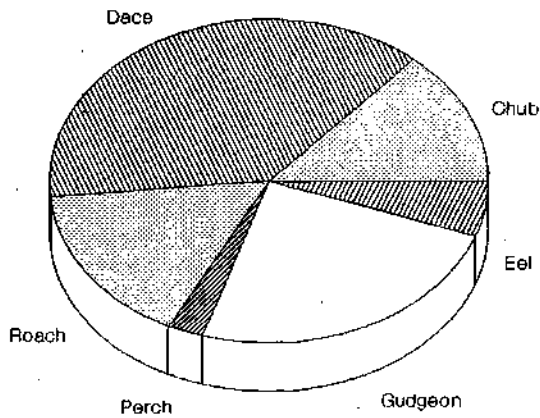
Biomass composition.

Do21 NGR. SD 506 100

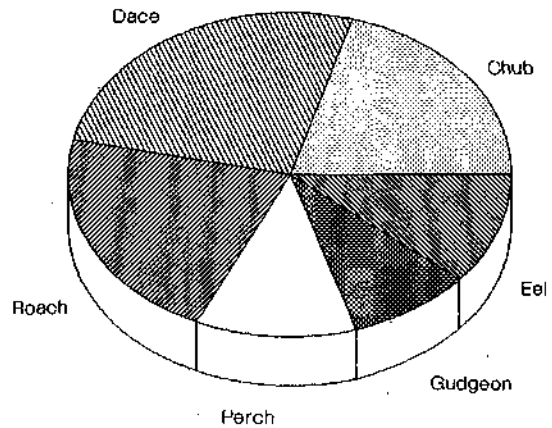
The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0.42	38.08
Dace	1.17	48.25
Roach	0.50	40.20
Perch	0.08	21.70
Pike	0	0
Gudgeon	0.75	17.00
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0.17	20.80*
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	3.09	186.03



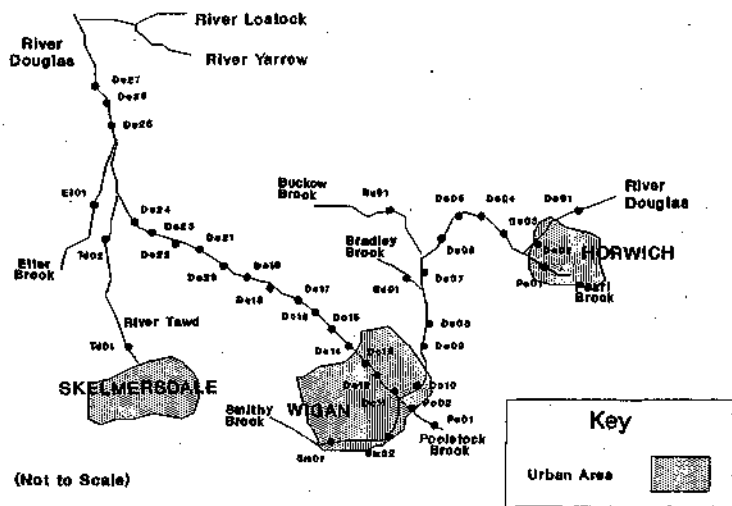
Population composition.



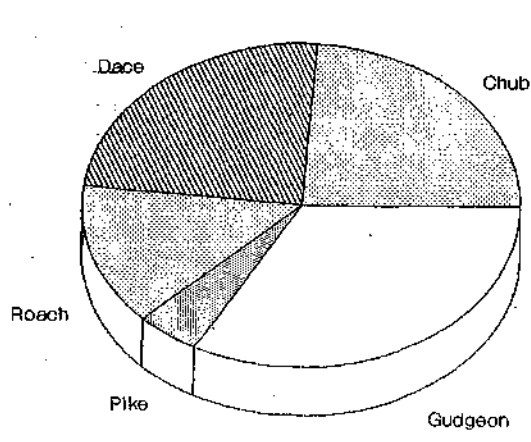
Biomass composition.

Do22 NGR. SD 498 101

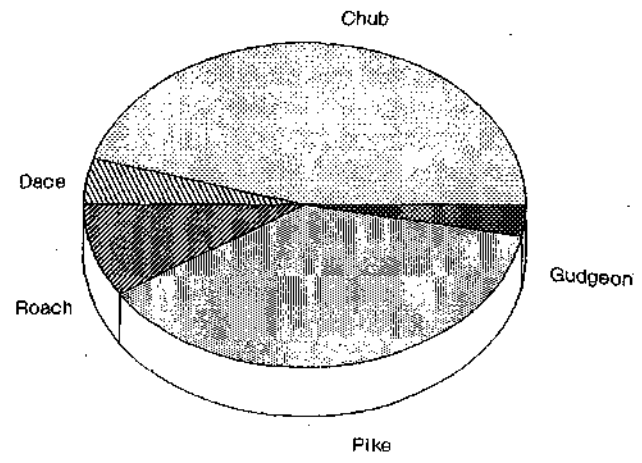
The River Douglas System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0.42	191.00
Dace	0.42	18.20
Roach	0.25	39.25
Perch	0	0
Pike	0.08	159.20
Gudgeon	0.58	12.80
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	1.75	421.55



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: River Douglas Site code: Do23
River System: River Douglas Date fished: 05.06.95
Location: Under Leeds/Liverpool Canal. N.G.R. SD 489 104

Habitat features

Length (m): 200 Mean width (m): 8.0
Area (m²): 1600 Mean depth (m): 1.0
Gradient (m/Km): 0.8 Max. depth (m): 2.0

Water level: low summer flow

Site description: 00% Pool 100% Glide 00% Riffle

Adjacent land use: Farmland

Method : Four anodes, pulsed DC (250V), operated from a punt, drifting downstream to a stopnet.

Fishery Classification (level 3)

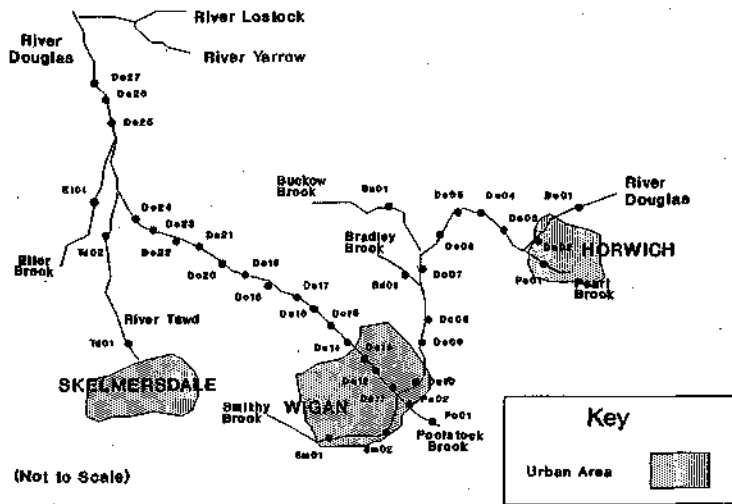
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	E	e

Comments

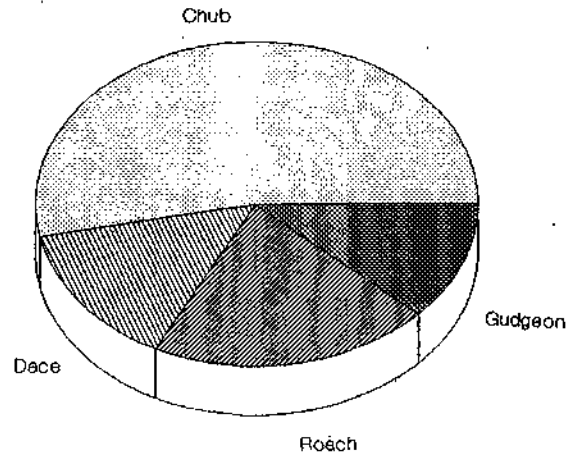
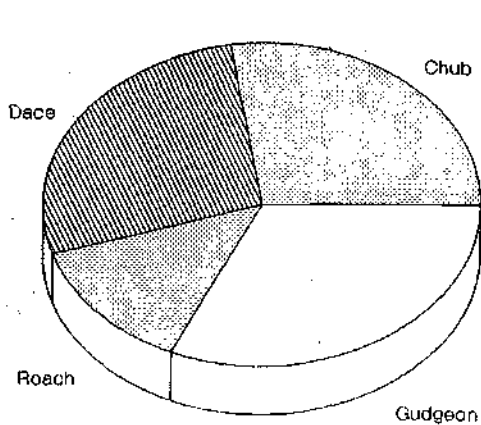
A small mixed coarse fish population of chub, roach, dace and gudgeon was caught at this site.

Do23 NGR. SD 489 104

The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0.37	62.60
Dace	0.37	14.26
Roach	0.18	20.18
Perch	0	0
Pike	0	0
Gudgeon	0.43	11.80
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coaræ Sp. (MCS)	0	0
Trout	0	0
Total	1.36	98.83



SITE REPORT

Site details

Watercourse: River Douglas Site code: Do24
River System: River Douglas Date fished: 05.06.95
Location: *Grimshaw Green* N.G.R. SD 484 121

Habitat features

Length (m): 200 Mean width (m): 8.0
Area (m²): 1600 Mean depth (m): 2.0
Gradient (m/Km): 0.8 Max. depth (m): 3.0

Water level: low summer flow

Site description: 00% Pool 100% Glide 00% Riffle

Adjacent land use: Farmland

Method : Four anodes, pulsed DC (250V), operated from a punt, drifting downstream to a stopnet.

Fishery Classification (level 3)

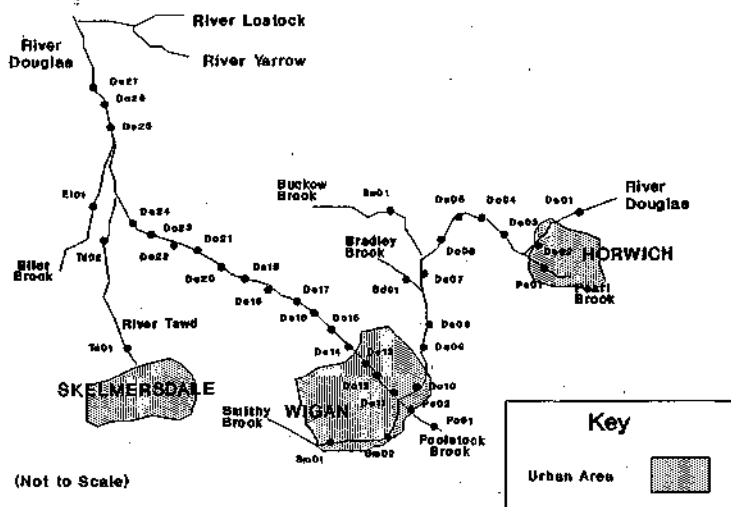
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	E	e

Comments

A small mixed coarse fish population of chub, roach, flounder, eel, stone loach and gudgeon was caught at this site.

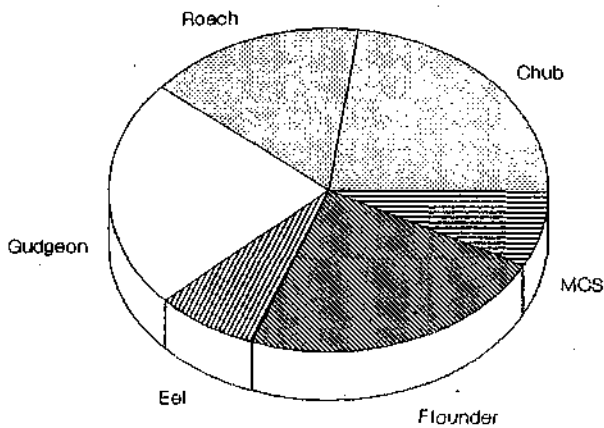
Do24 NGR. SD 484 121

The River Douglas System.

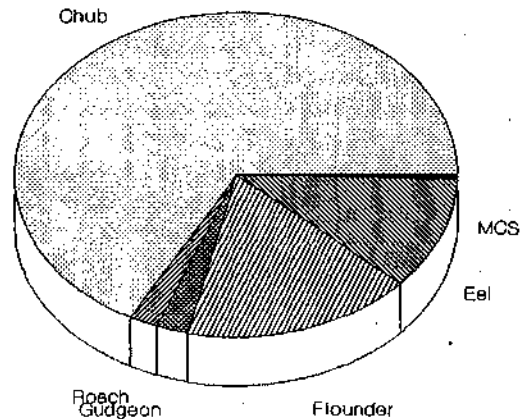


(Not to Scale)

Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0.18	118.75
Dace	0	0
Roach	0.126	3.70
Perch	0	0
Pike	0	0
Gudgeon	0.18	4.20
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0.06	20.00
Flounder	0.18	29.70
Minor Coarse Sp. (MCS)	0.06	0.81
Trout	0	0
Total	0.785	177.16



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: River Douglas	Site code: Do25
River System: River Douglas	Date fished: 13.06.95
Location: Snipe Hall	N.G.R. SD 476 127

Habitat features

Length (m): 300	Mean width (m): 15.0
Area (m ²): 4500	Mean depth (m): 1.0
Gradient (m/Km): 0.5	Max. depth (m): 3.0
Water level: low summer flow	

Site description: 00% Pool 100% Glide 00% Riffle

Adjacent land use: Farmland

Method : Four anodes, pulsed DC (250V), operated from a punt, drifting downstream to a stopnet.

Fishery Classification (level 3)

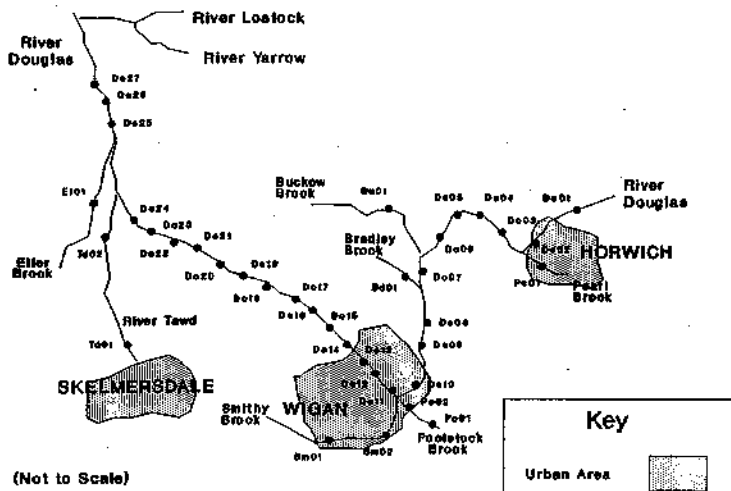
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	E	e

Comments

A small mixed coarse fish population of pike, flounder and eel was caught at this site.

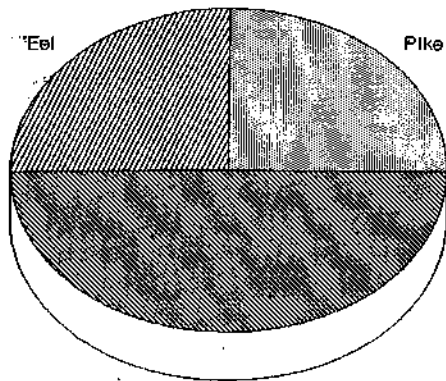
Do25 NGR. SD 476 127

The River Douglas System.

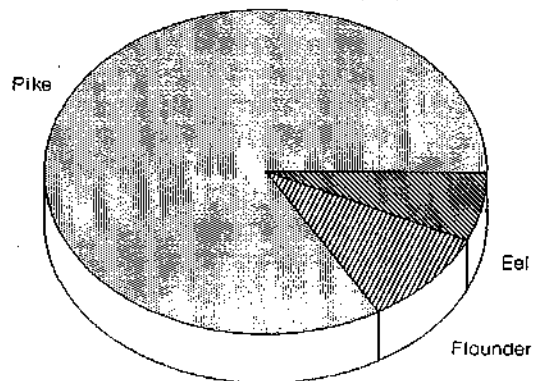


(Not to Scale)

Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0.02	36.60
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0.02	2.90
Flounder	0.04	4.10
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	0.08	42.50



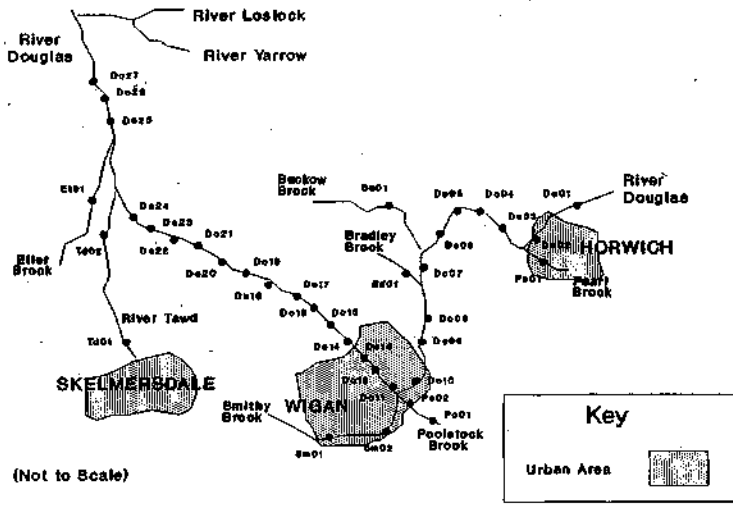
Population composition.



Biomass composition.

Do26 NGR. SD 473 138

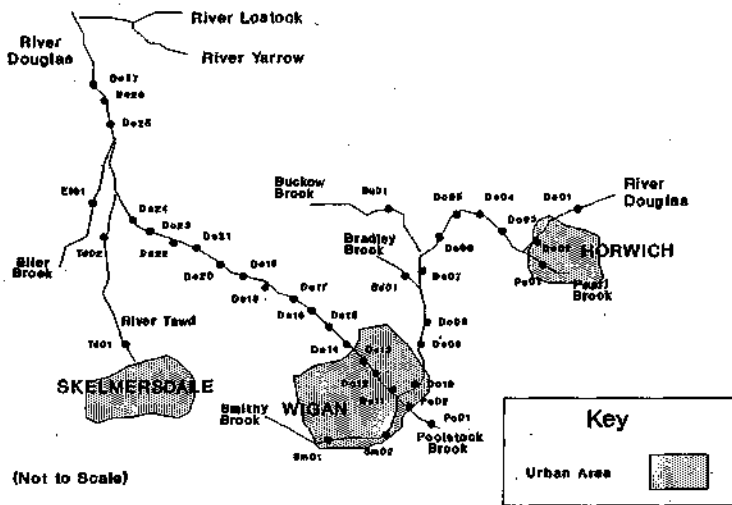
The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	0	0

Do27 NGR. SD 467 157

The River Douglas System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	0	0

Population composition.

Biomass composition.

SITE REPORT

Site details

Watercourse: Pearl Brook Site code: Pe01
River System: River Douglas Date fished: 19.06.95
Location: Upstream STW N.G.R. SD 628 108

Habitat features

Length (m): 50 Mean width (m): 4.0
Area (m²): 200 Mean depth (m): 0.7
Gradient (m/Km): 6.7 Max. depth (m): 1.3

Water level: low summer flow

Site description: 60% Pool 20% Glide 20% Riffle

Adjacent land use: Urban area

Method : One anode, pulsed DC (50V), wading to an upstream stopnet.

Fishery Classification (level 3)

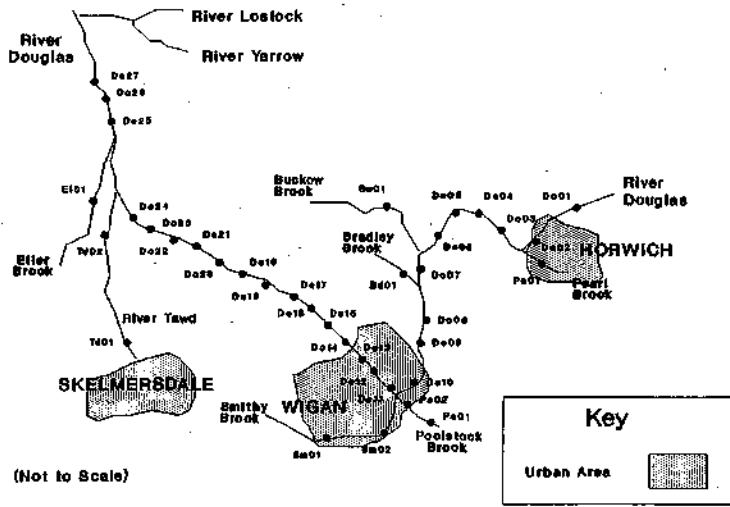
	Absolute Classification	Relative Classification
Salmonids	E	e
Coarse	E	e

Comments

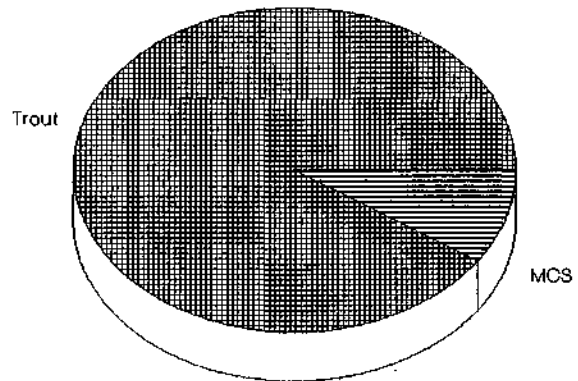
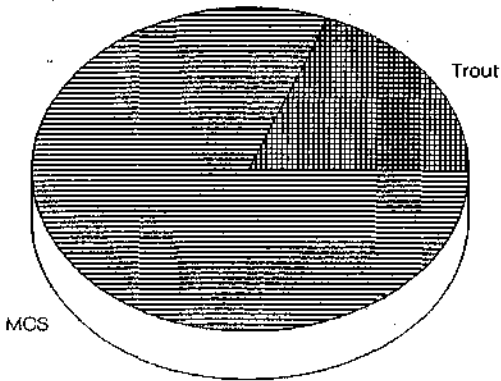
Three trout of lengths 165 to 260mm were caught at this site, in addition to stickleback and bullhead.

Pe01 NGR. SD 628 108

The River Douglas System.

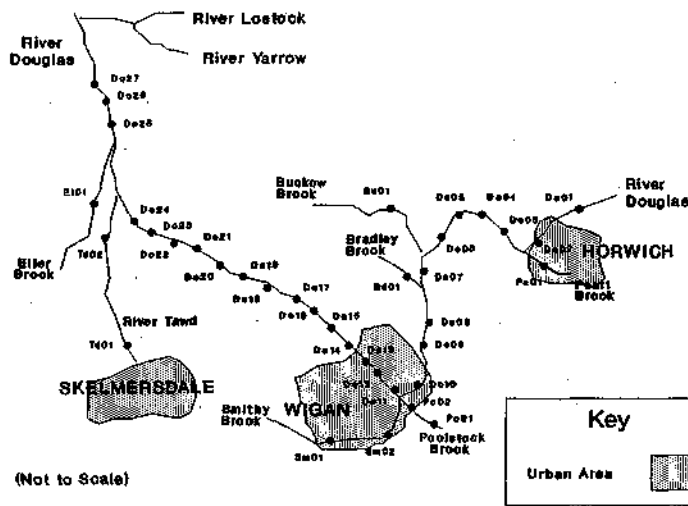


Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	10.50	27.50
Trout	2.50	262.00
Total	13.00	289.50

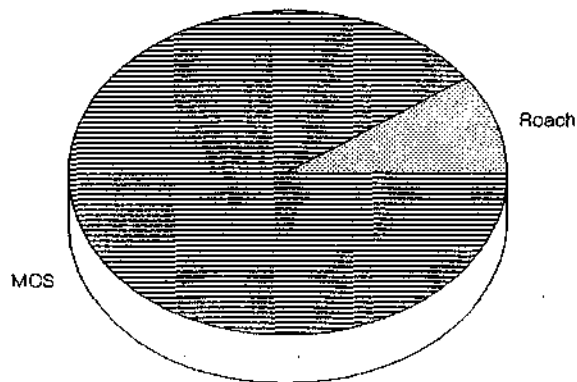


Bu01 NGR. SD 582 120

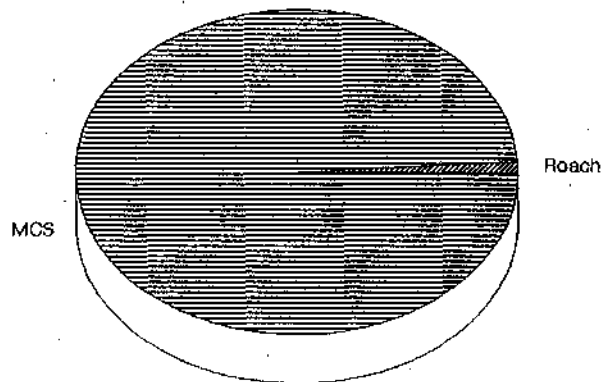
The River Douglas System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	2.00	2.00
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	18.00	185.00
Trout	0	0
Total	20.00	187.00



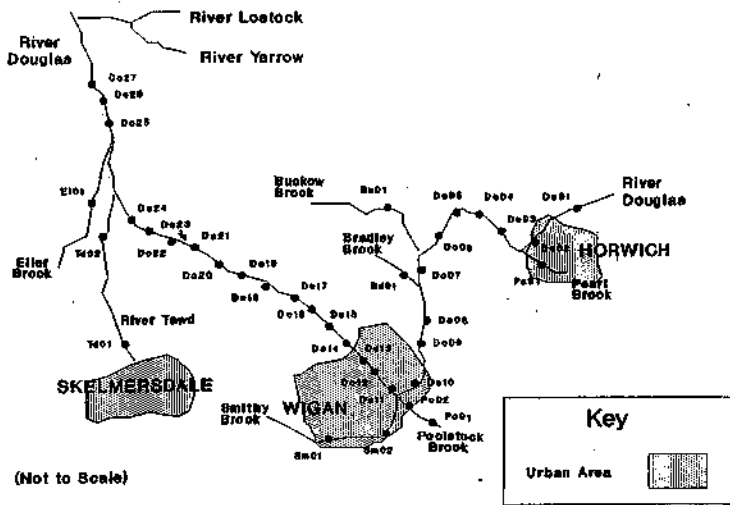
Population composition.



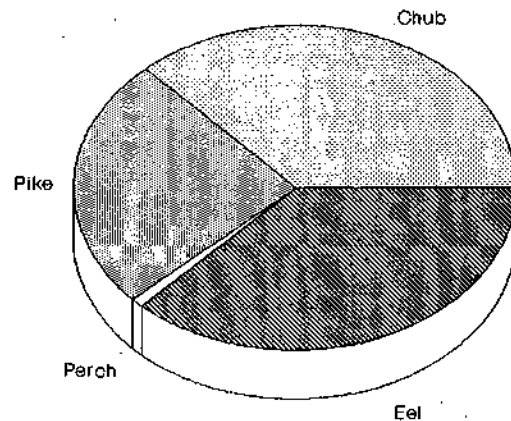
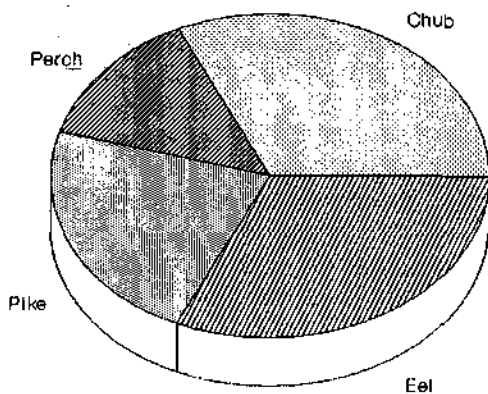
Biomass composition.

Po01 NGR. SD 578 043

The River Douglas System.

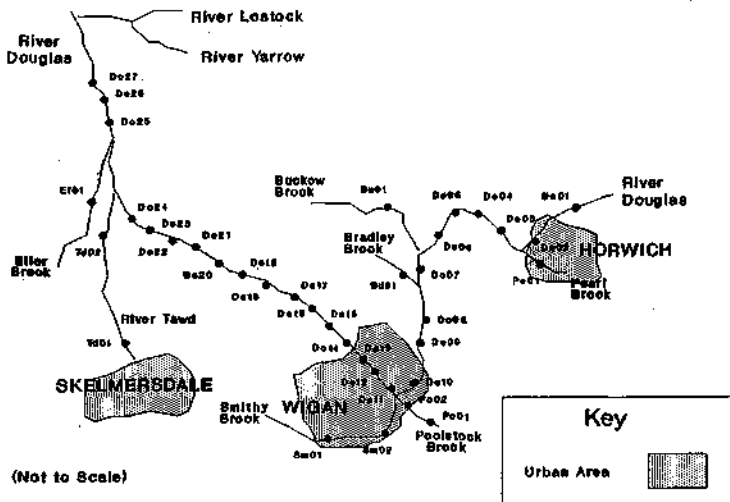


Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	3.50	980.00
Dace	0	0
Roach	0	0
Perch	1.50	25.00
Pike	2.50	670.00
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	3.50	990.00
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	11.00	2665.00

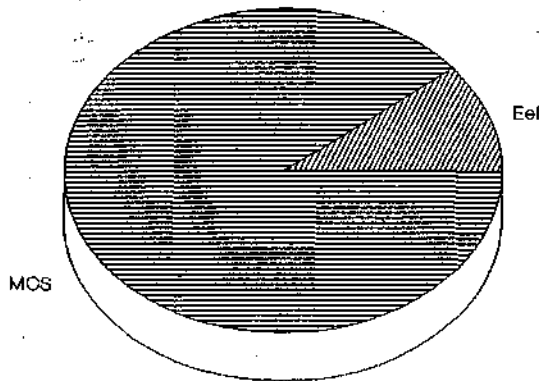


Po02 NGR. SD 574 048

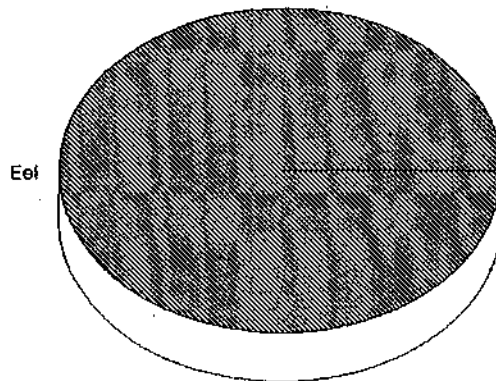
The River Douglas System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Rosch	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	1.33	200.00*
Flounder	0	0
Minor Coarse Sp. (MCS)	10.6	?
Trout	0	0
Total	11.93	200.00



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: Smithey Brook

Site code: Sm01

River System: River Douglas

Date fished: 20.06.95

Location: *Lamberhead Green*

N.G.R. SD 544 042

Habitat features

Length (m): 50

Mean width (m): 4.0

Area (m²): 200

Mean depth (m): 0.3

Gradient (m/Km): 7.7

Max. depth (m): 0.4

Water level: low summer flow

Site description: 40% Pool 20% Glide 40% Riffle

Adjacent land use: Urban area

Method: One anode, pulsed DC (40V), wading to an upstream stopnet.

Fishery Classification (level 3)

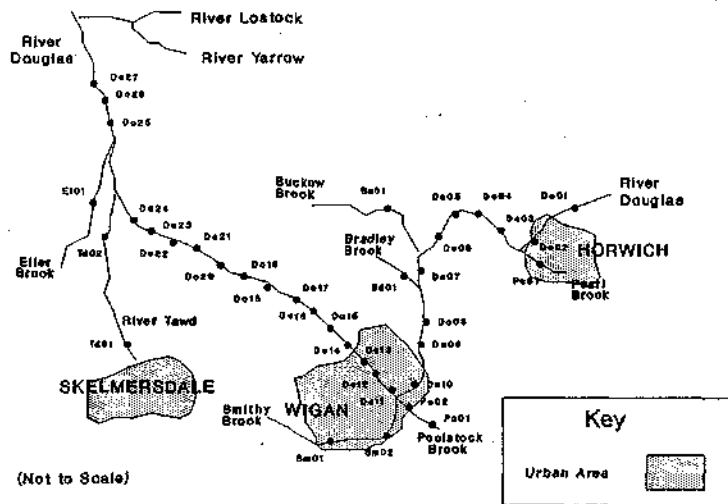
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	F	e

Comments

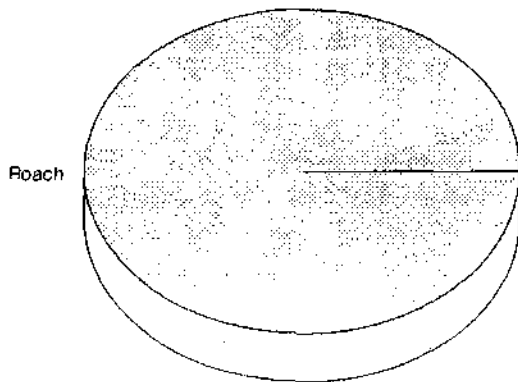
A single juvenile roach was caught at this site.

Sm01 NGR. SD 544 042

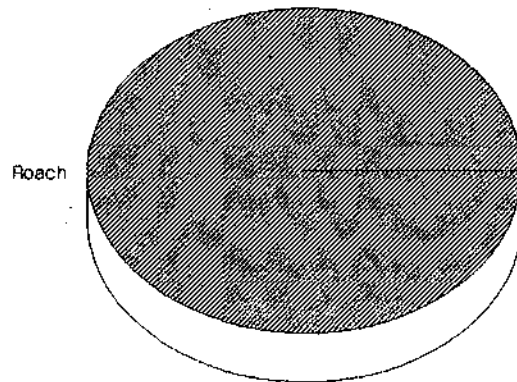
The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0.50	3.00*
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	0.50	3.00



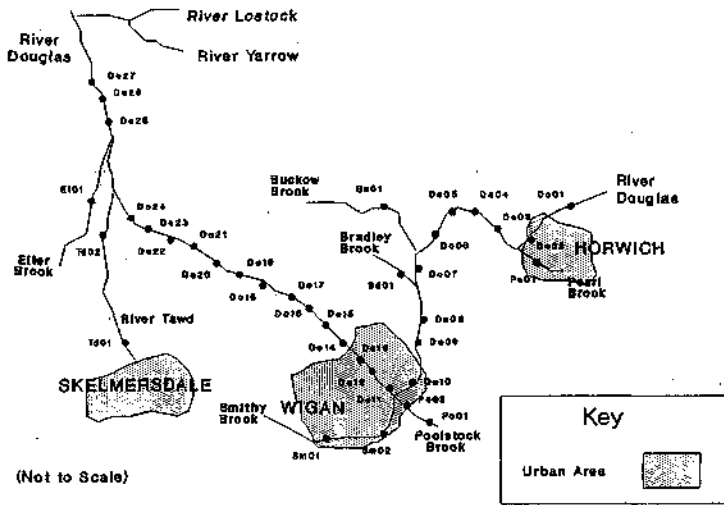
Population composition.



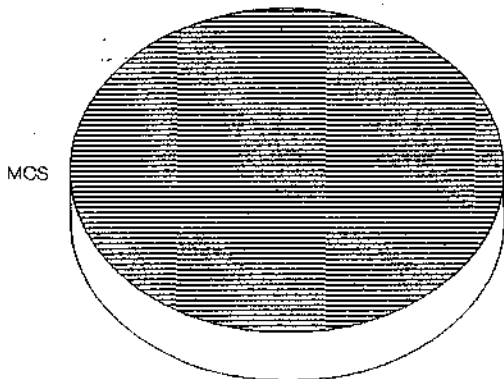
Biomass composition.

Sm02 NGR. SD 571 046

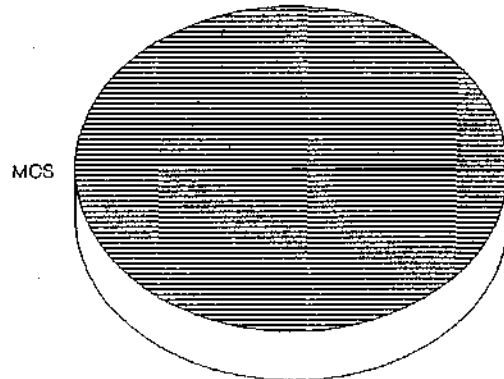
The River Douglas System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	2.00	0
Trout	0	0
Total	2.00	0



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: River Tawd	Site code: Td01
River System: River Douglas	Date fished: 20.06.95
Location: <i>Ashbons</i>	N.G.R. SD 478 083

Habitat features

Length (m): 50	Mean width (m): 9.0
Area (m ²): 450	Mean depth (m): 0.75
Gradient (m/Km): 6.5	Max. depth (m): 1.2
Water level: low summer flow	
Site description: 40% Pool 60% Glide 00% Riffle	
Adjacent land use: Urban area	
Method : One anode, pulsed DC (50V), wading to an upstream stopnet.	

Fishery Classification (level 3)

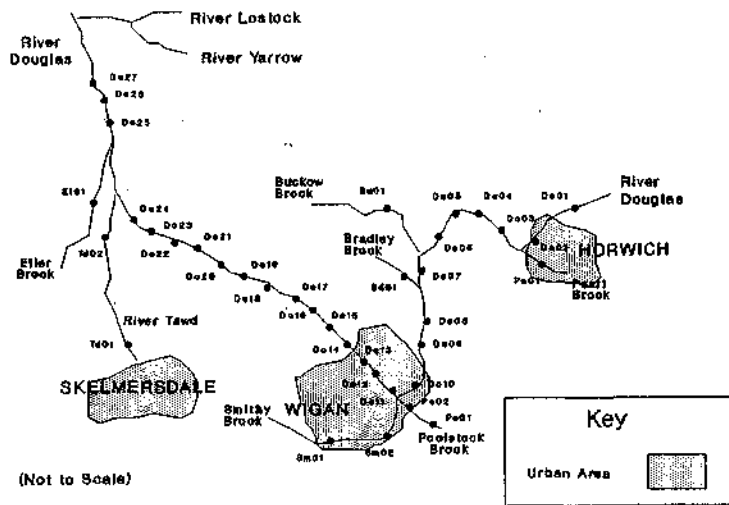
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	F	e

Comments

Nothing was caught at this site.

Td01 NGR. SD 478 083

The River Douglas System.



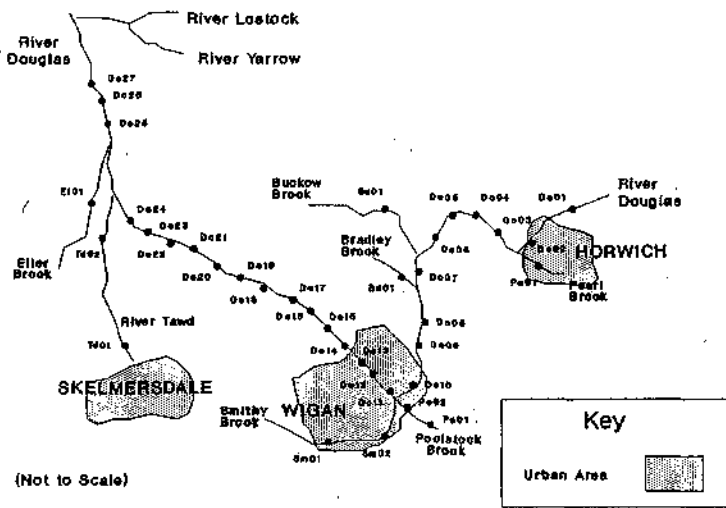
Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	0	0

Population composition.

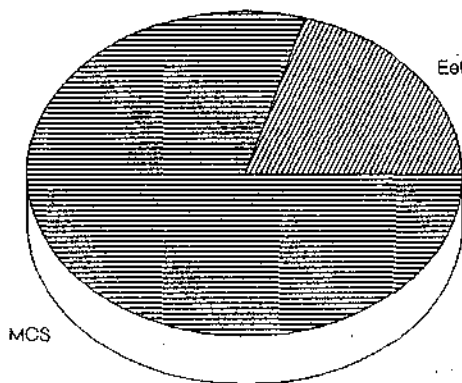
Biomass composition.

Td02 NGR. SD 474 117

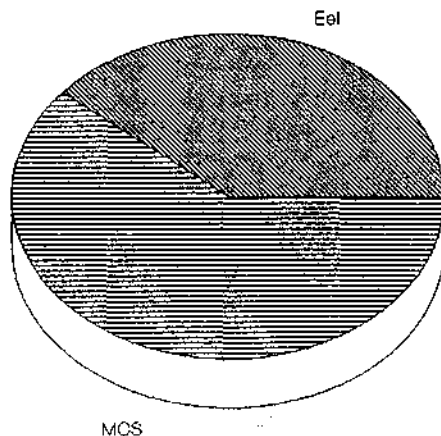
The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	1.75	44.50
Flounder	0	0
Minor Coarse Sp. (MCS)	6.75	70.00
Trout	0	0
Total	8.50	114.5



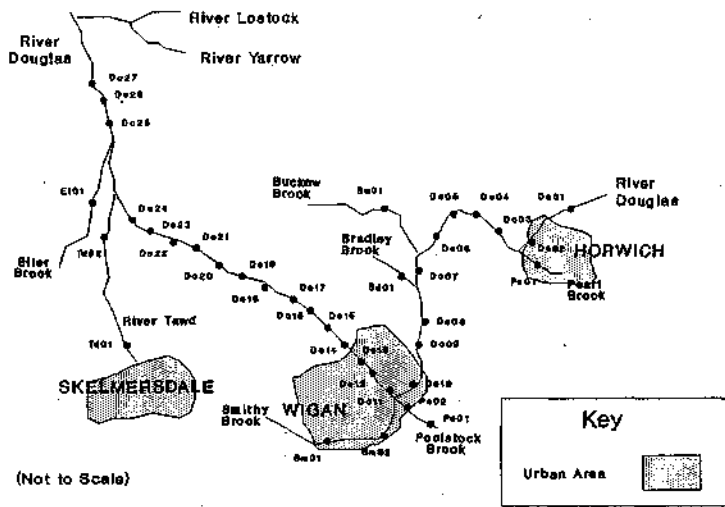
Population composition.



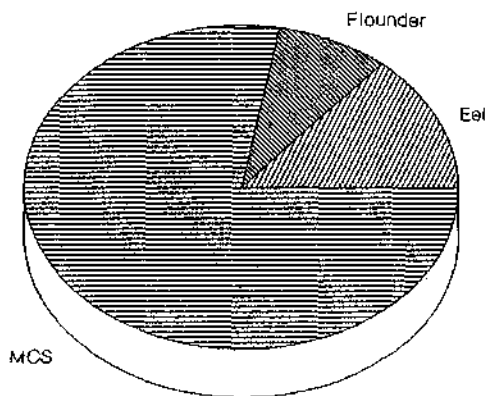
Biomass composition.

EI01 NGR. SD 462 137

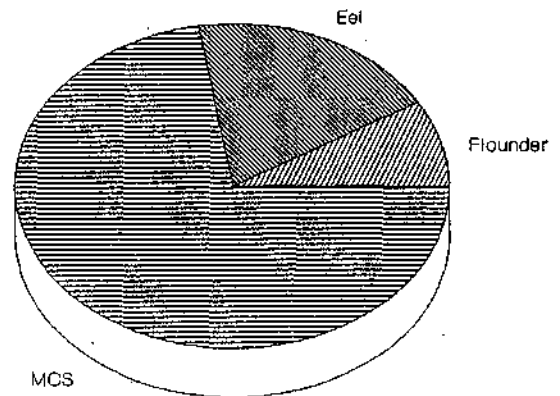
The River Douglas System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	3.30	58.60
Flounder	2.00	28.70
Minor Coarse Sp. (MCS)	18.60	224.00
Trout	0	0
Total	23.90	308.30



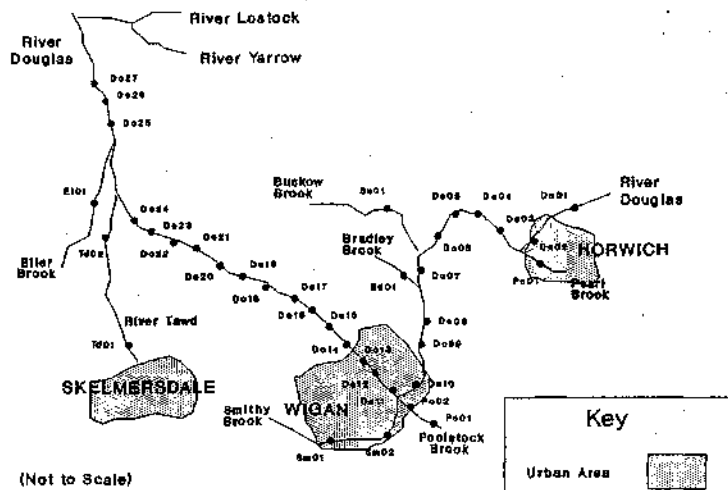
Population composition.



Biomass composition.

Bd01 NGR. SD 578 102

The River Douglas System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Lamprey	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	0	0

Population composition.

Biomass composition.

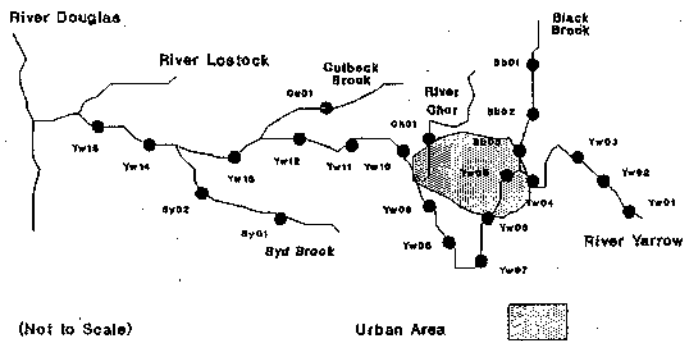
Appendix 3.

Site survey information

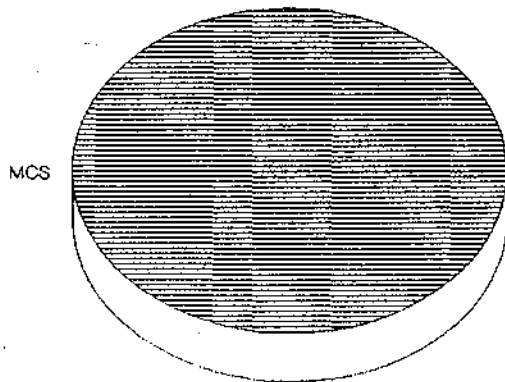
3B. River Yarrow and Tributaries

Yw01 NGR. SD 615 151

The River Yarrow System.



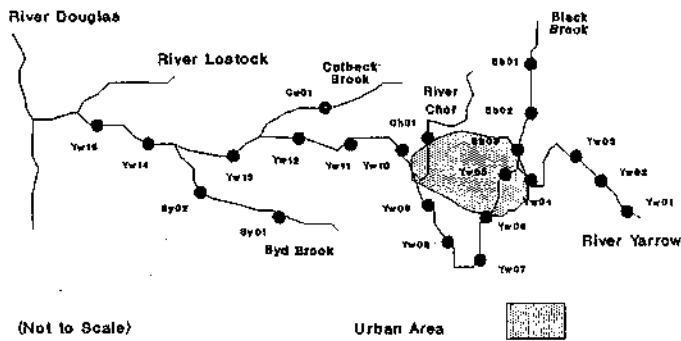
Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	27.00	?
Trout	0	0
Total	27.00	0



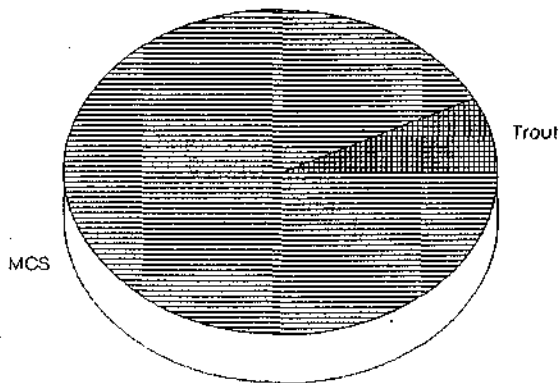
Population composition.

Yw02 NGR. SD 602 163

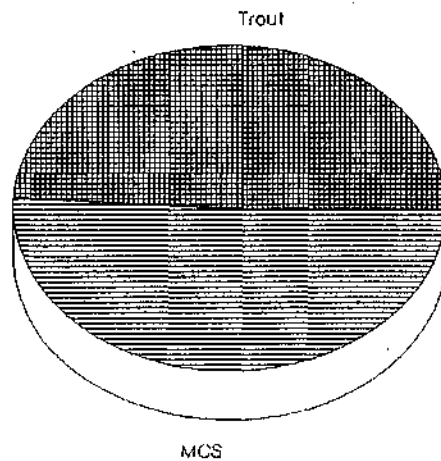
The River Yarrow System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	16.90	61.30
Trout	1.30	49.30
Total	17.20	100.60



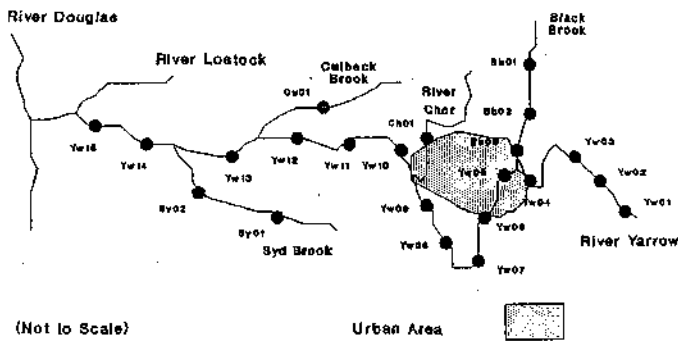
Population composition.



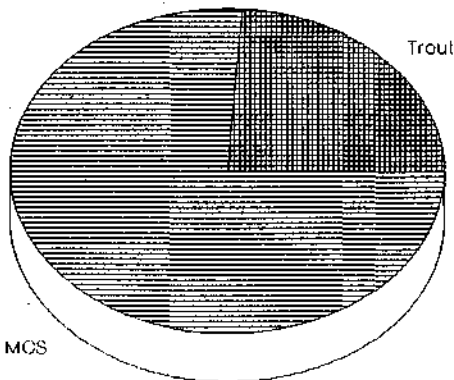
Biomass composition.

Yw03 NGR. SD 596 156

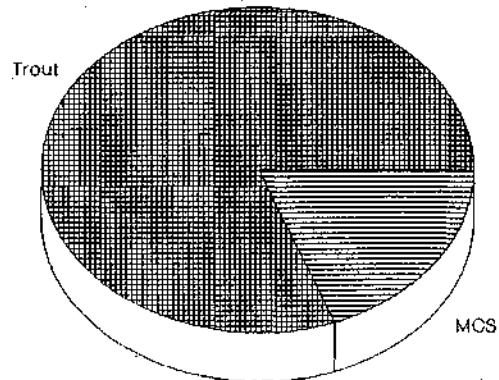
The River Yarrow System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarct Sp. (MCS)	14.00	83.60
Trout	4.40	350.00
Total	18.40	433.60



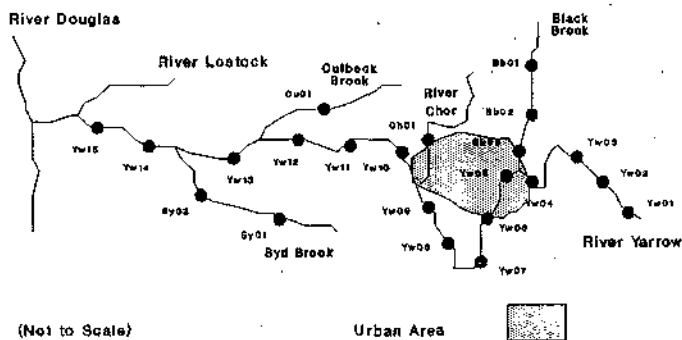
Population composition.



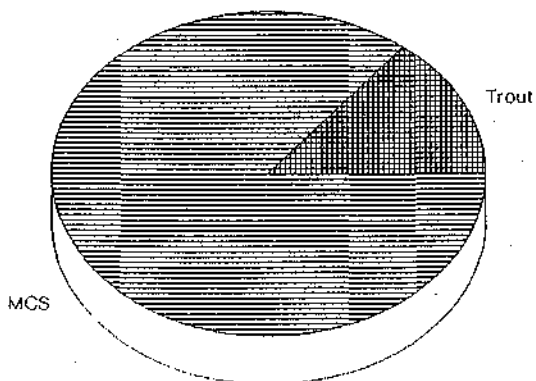
Biomass composition.

Yw04 NGR. SD 594 164

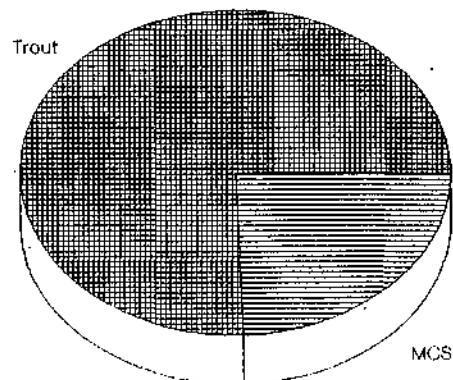
The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	4.50	27.50
Trout	0.75	86.00
Total	5.25	112.50



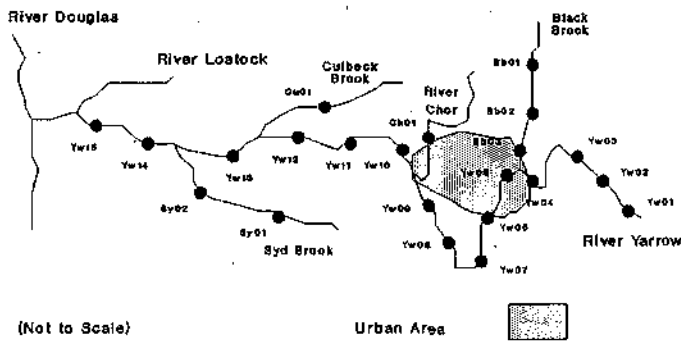
Population composition.



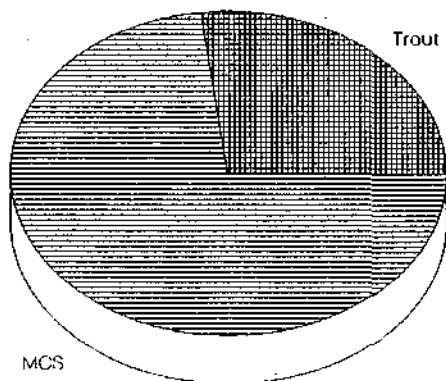
Biomass composition.

Yw05 NGR. SD 592 162

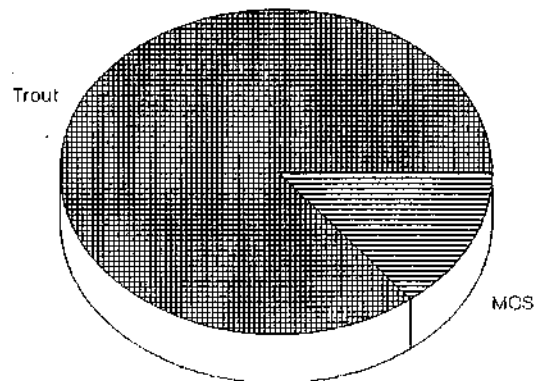
The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	3.10	31.40
Trout	1.14	186.70
Total	4.24	217.10



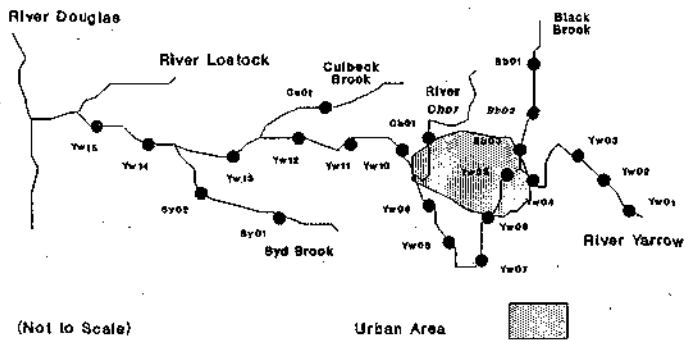
Population composition.



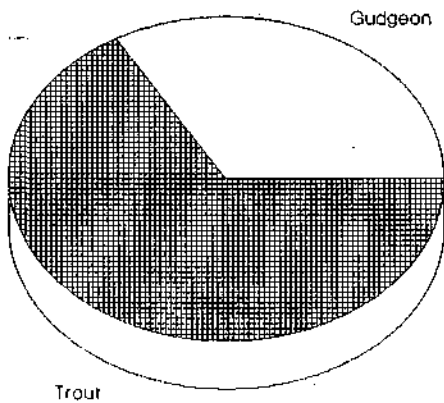
Biomass composition.

Yw06 NGR. SD 588 156

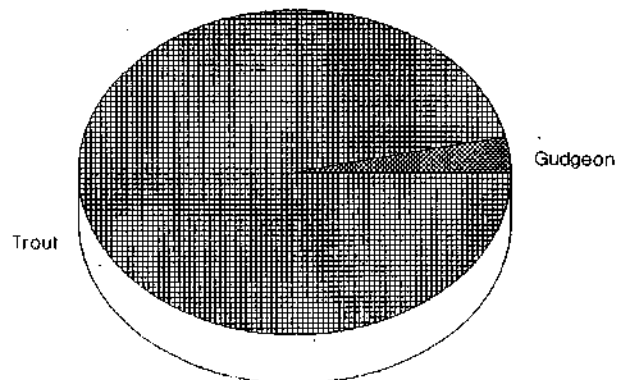
The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0.50	9.00
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	1.00	250.50
Total	1.50	259.50



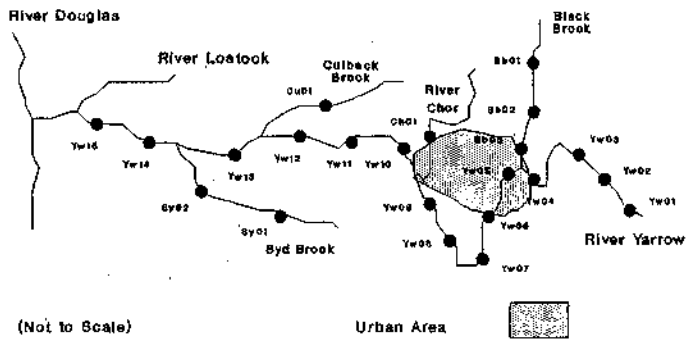
Population composition.



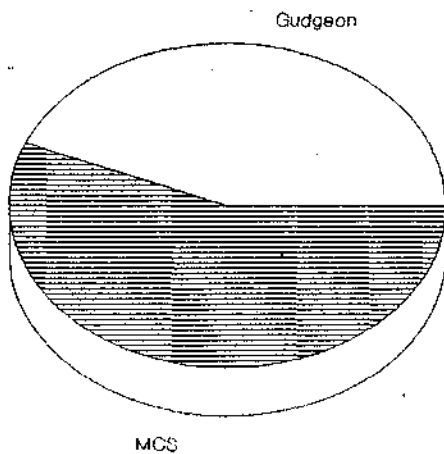
Biomass composition.

Yw07 NGR. SD 581 143

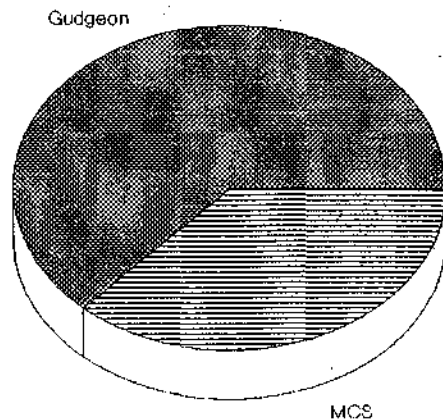
The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	1.75	30.50
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	2.25	17.75
Trout	0	0
Total	4.00	48.25



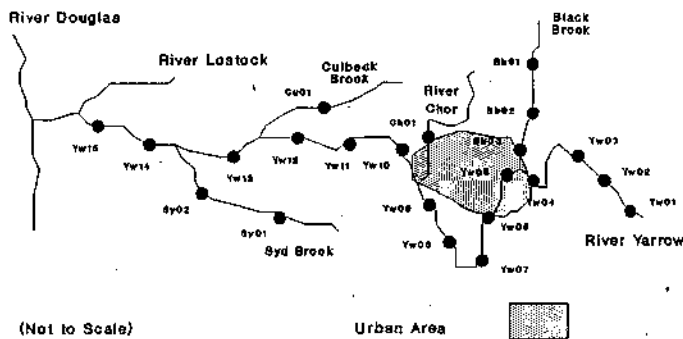
Population composition.



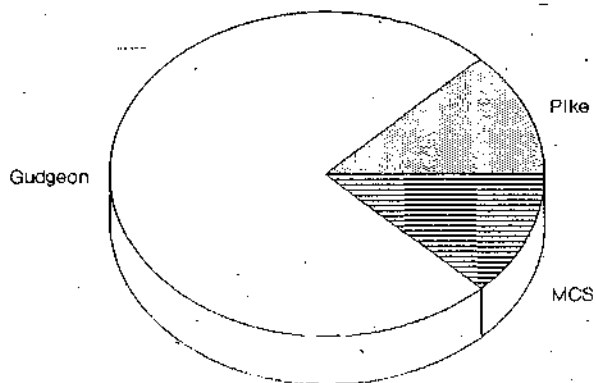
Biomass composition.

Yw08 NGR. SD 571 153

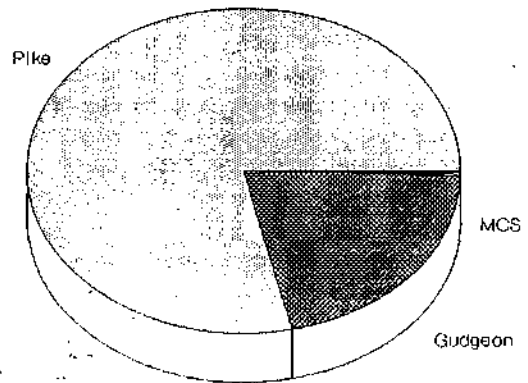
The River Yarrow System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0.50	180.00
Gudgeon	3.00	48.50
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0.50	1.00
Trout	0	0
Total	4.00	229.50



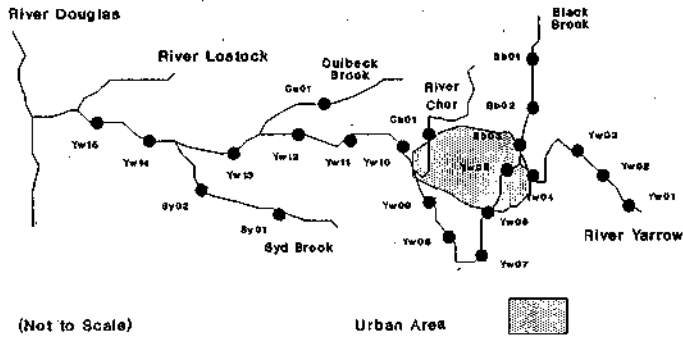
Population composition.



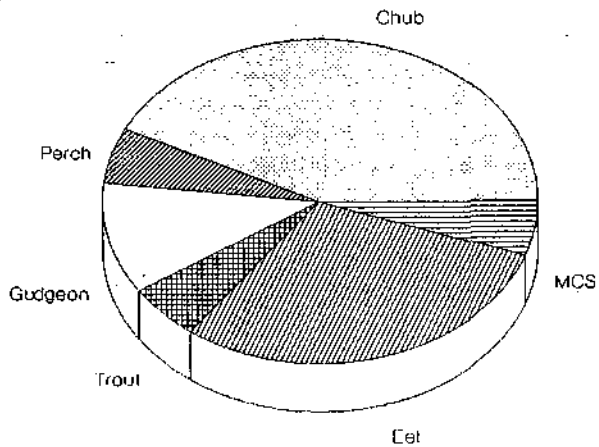
Biomass composition.

Yw09 NGR. SD 568 159

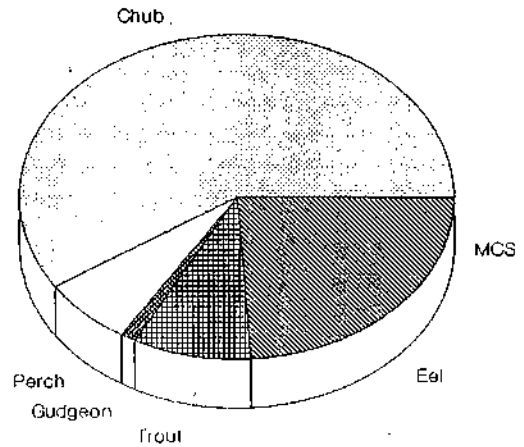
The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	2.30	496.00
Dace	0	0
Roach	0	0
Perch	0.30	57.00
Pike	0	0
Gudgeon	0.60	9.30
Bream	0	0
Tench	0	0
Carp	0	0
Eel	1.60	201.00
Flounder	0	0
Minor Coarse Sp. (MCS)	0.30	0.60
Trout	0.30	73.80
Total	5.40	837.60



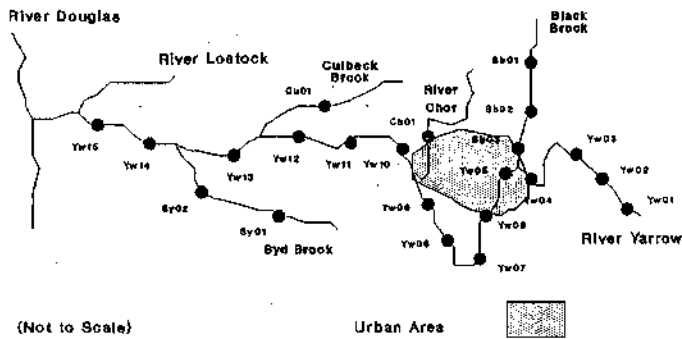
Population composition.



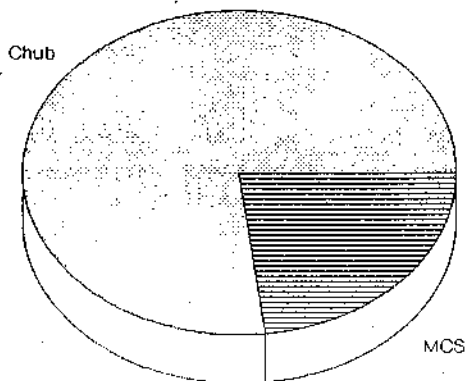
Biomass composition.

Yw10 NGR. SD 565 173

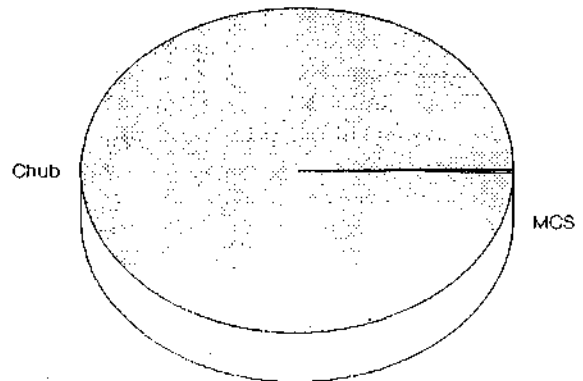
The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	1.00	154.00
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0.30	0.60
Trout	0	0
Total	1.30	154.60



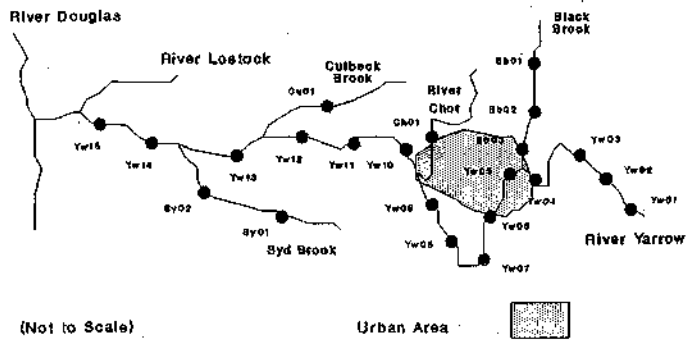
Population composition.



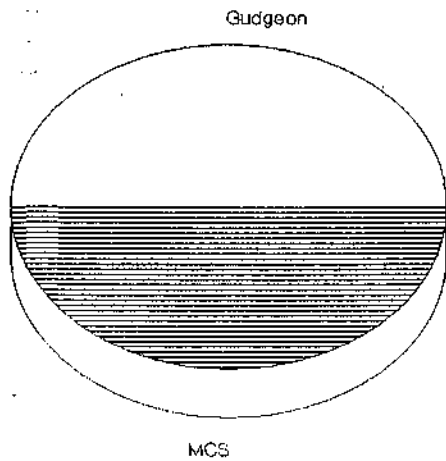
Biomass composition.

Yw11 NGR. SD 556 178

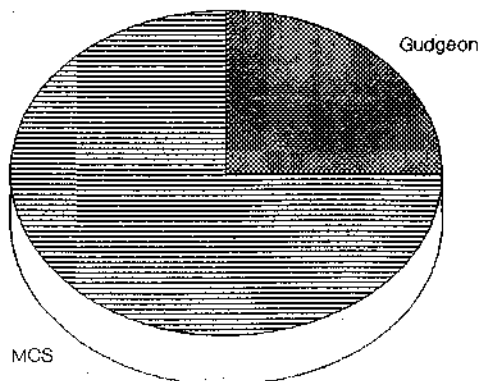
The River Yarrow System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0.20	0.40
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0.20	1.20
Trout	0	0
Total	0.40	1.60



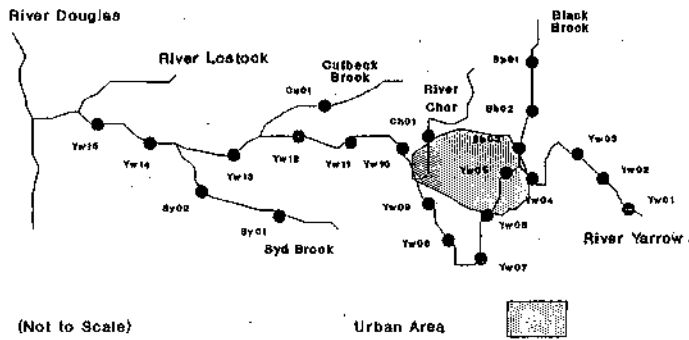
Population composition.



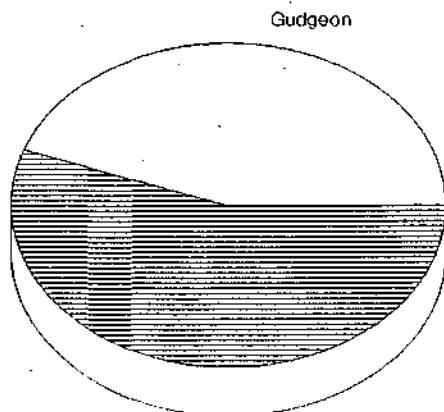
Biomass composition.

Yw12 NGR. SD 544 179

The River Yarrow System.

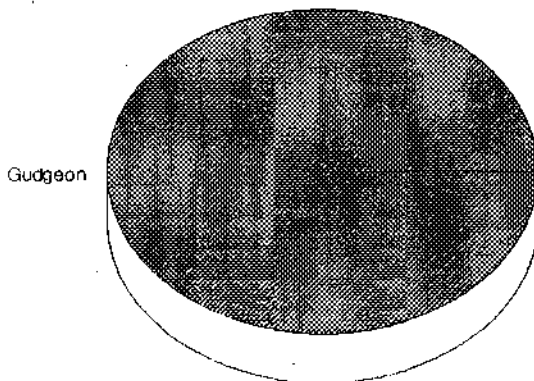


Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	1.00	25.00
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS.)	1.25	?
Trout	0	0
Total	2.25	25.00



MCS.

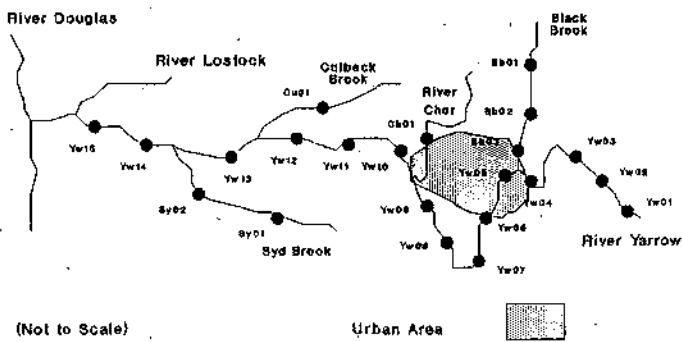
Population composition.



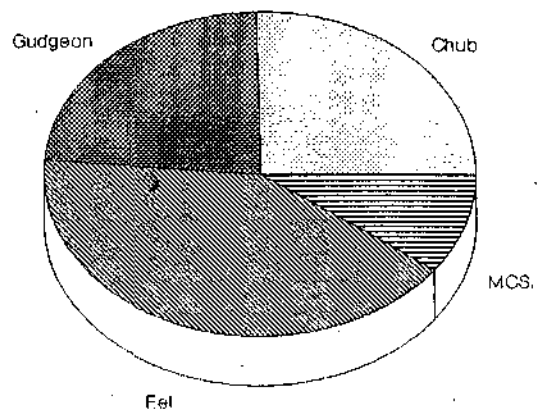
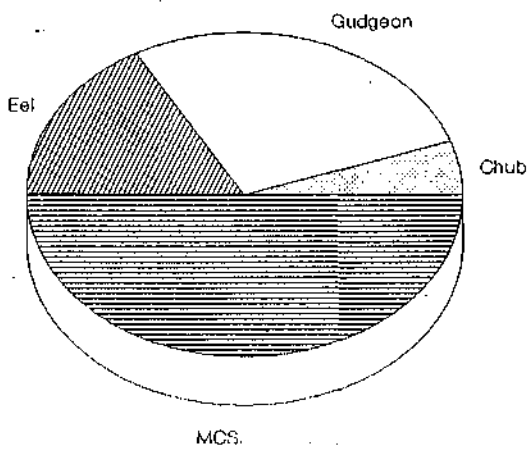
Biomass composition.

YW13 NGR. SD 514 178

The River Yarrow System.

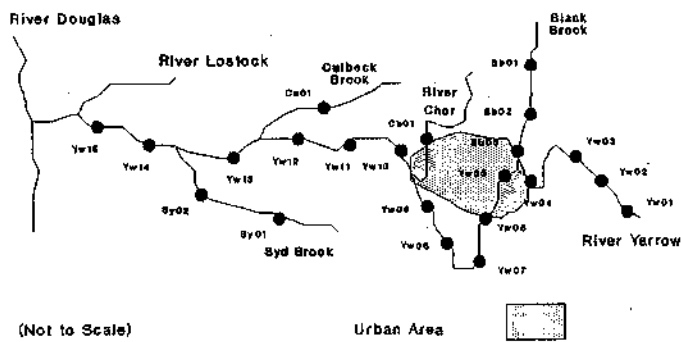


Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0.80	111.30
Dace	0	0
Roach	0	0
Percch	0	0
Pike	0	0
Gudgeon	4.16	103.00
Bream	0	0
Tench	0	0
Carp	0	0
Eel	2.50	181.60
Flounder	0	0
Minor Coarse Sp. (MCS.)	7.50	44.70
Trout	0	0
Total	14.96	440.80

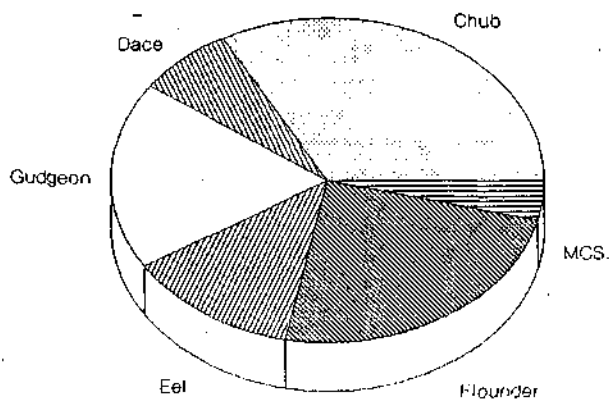


Yw14 NGR. SD 498 179

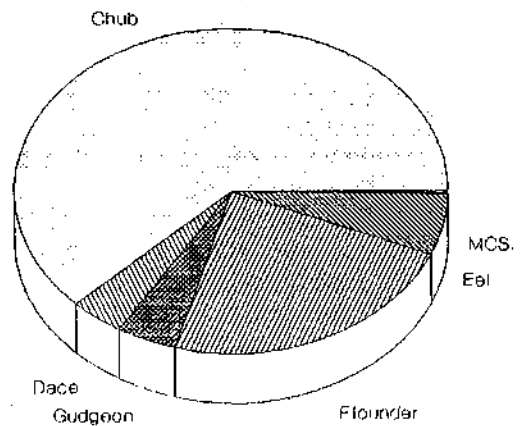
The River Yarrow System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	4.10	788.20
Dace	0.89	49.80
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	2.32	55.10
Bream	0	0
Tench	0	0
Carp	0	0
Eel	1.60	75.89*
Flounder	3.00	282.00
Minor Coarse Sp. (MCS)	0.50	4.10
Trout	0	0
Total	12.41	1286.09



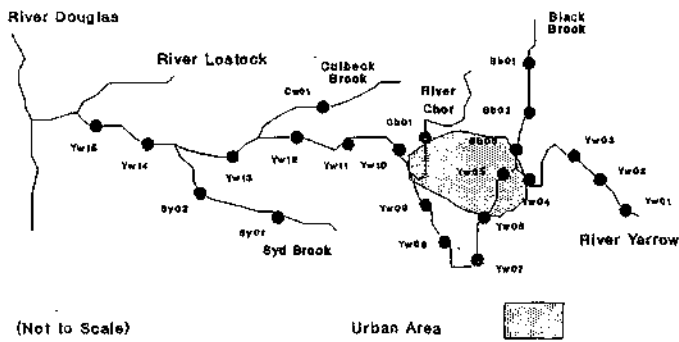
Population composition.



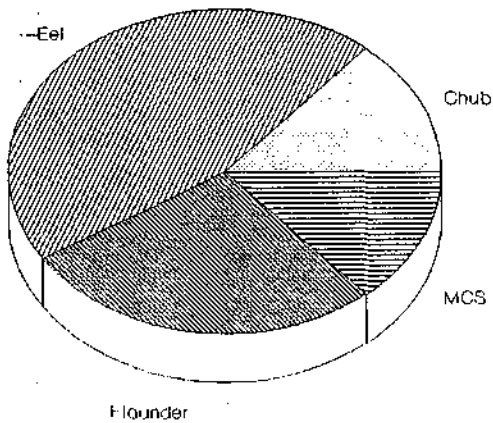
Biomass composition.

Yw15 NGR. SD 480 186

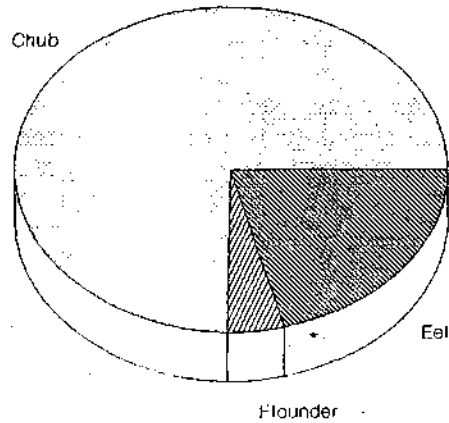
The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0.30	213.00
Dace	0	0
Rosch	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	1.00	60.00-
Flounder	0.60	12.00
Minor Coarse Sp. (MCS.)	0.30	-
Trout	0	0
Total	2.20	285.00



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: Black Brook

Site code: Bb01

River System: River Yarrow

Date fished: 03.07.95

Location: U/s mbl

N.G.R. SD 598 185

Habitat features

Length (m): 50

Mean width (m): 3

Area (m²): 150

Mean depth (m): 0.4

Gradient (m/Km): 7.93

Water level: low summer flow

Site description: 10% Pool 80% Glide 10% Riffle

Adjacent land use: Roads and urban areas

Method: Upstream electric fishing, 2 anodes, pulsed DC. (50V), wading, no stopnets.

Fishery Classification (level 3)

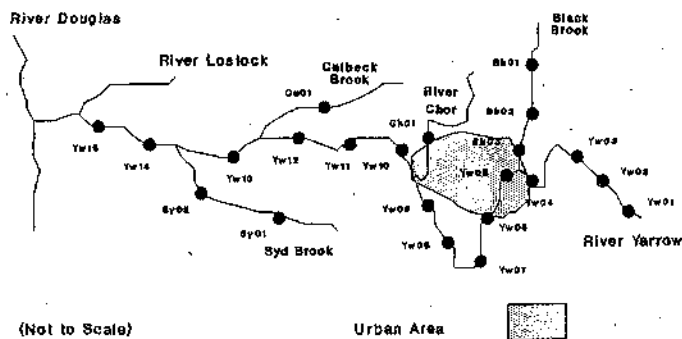
	Absolute Classification	Relative Classification
Salmonids	E	e
Coarse	E	e

Comments

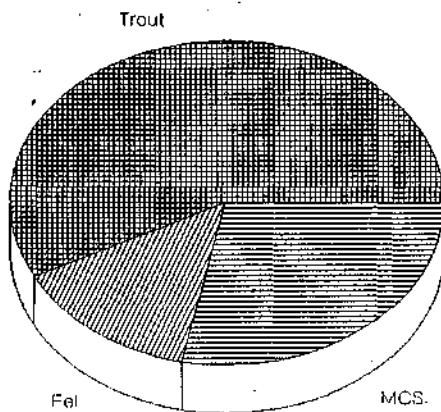
Eight trout of lengths 60 mm to 200 mm were caught at this site in addition to eels and sticklebacks.

Bb01 NGR. SD 598 185

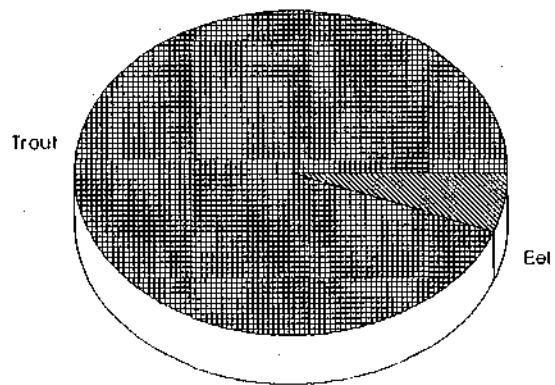
The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	1.30	17.30
Flounder	0	0
Minor Coarse Sp. (MCS.)	2.60	?
Trout	5.30	272.60
Total	9.20	289.90



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: Black Brook

Site code: Bb02

River System: River Yarrow

Date fished: 03.07.95

Location: D/s Hospital

N.G.R. SD 597 174

Habitat features

Length (m): 50

Mean width (m): 4

Area (m²): 200

Mean depth (m): 0.6

Gradient (m/Km): 7.93

Max. depth (m): 1.0

Water level: low summer flow

Site description: 40% Pool 40% Glide 20% Riffle

Adjacent land use: Roads and urban areas

Method: Upstream electric fishing, 2 anodes, pulsed DC. (50V), wading, no stopnets.

Fishery Classification (level 3)

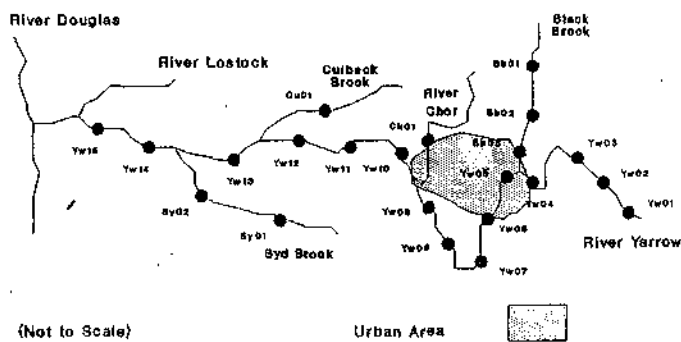
	Absolute Classification	Relative Classification
Salmonids	E	e
Coarse	E	c

Comments

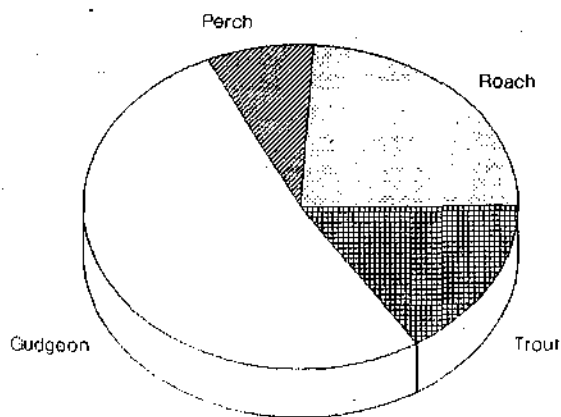
Four trout of lengths 235 mm to 255 mm were caught at this site in addition to gudgeon, roach and perch.

Bb02 NGR. SD 597 174

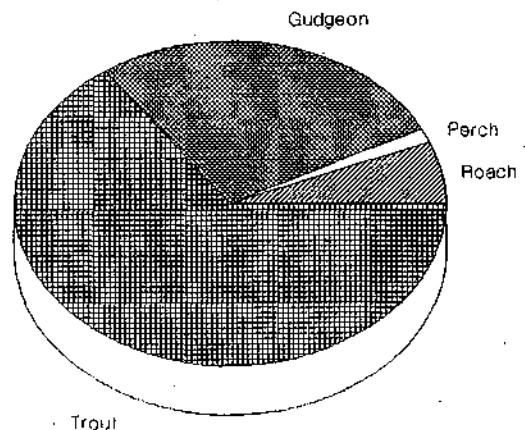
The River Yarrow System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	3.00	42.50
Perch	1.00	9.50
Pike	0	0.
Gudgeon	6.50	186.00
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS.)	0	0
Trout	2.00	444.00
Total	12.50	682.00



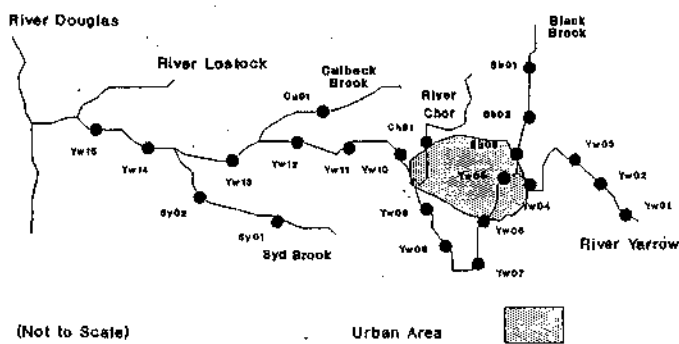
Population composition.



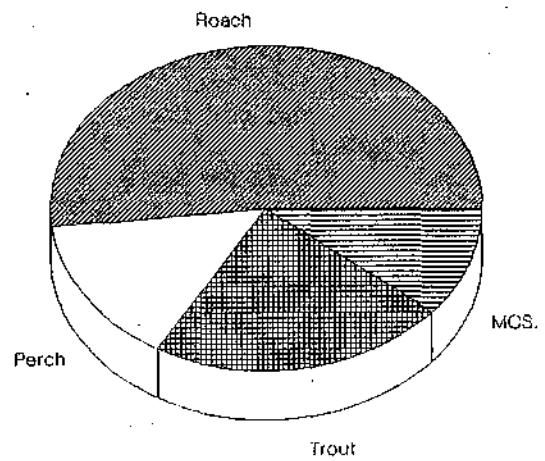
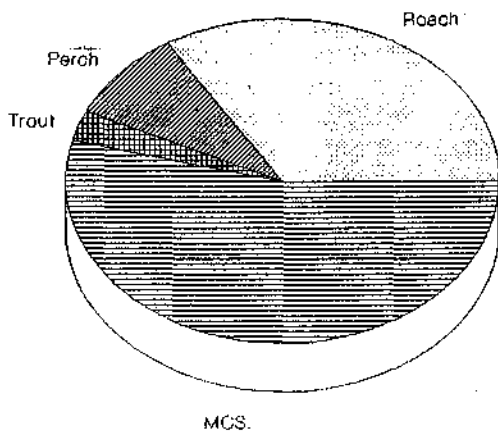
Biomass composition.

Bb03 NGR. SD 593 164

The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	3.70	233.00
Perch	1.00	66.00
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS.)	6.90	50.00
Trout	0.33	100.00
Total	10.93	449.00



SITE REPORT

Site details

Watercourse: River Chor

Site code: Ch01

River System: River Yarrow

Date fished: 10.07.95

Location: *Opposite college*

N.G.R. SD 570 176

Habitat features

Length (m): 50

Mean width (m): 3

Area (m²): 150

Mean depth (m): 0.3

Gradient (m/Km): 20.0

Max. depth (m): 0.4

Water level: low summer flow

Site description: 60% Pool 20% Glide 20% Riffle

Adjacent land use: Urban areas

Method: Upstream electric fishing, 1 anode, pulsed DC. (50V), wading, no stopnet.

Fishery Classification (level 3)

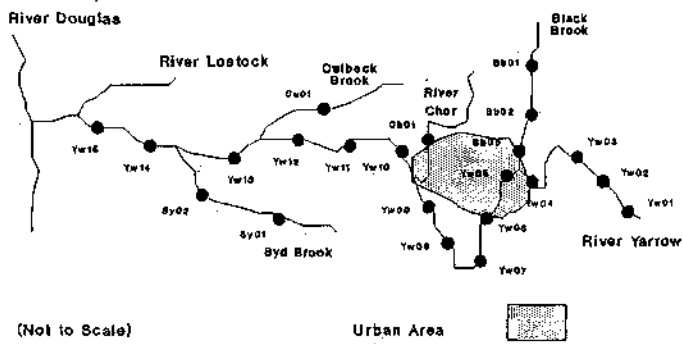
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	F	e

Comments

No fish species of any type were caught at this site.

Ch01 NGR. SD 570 176

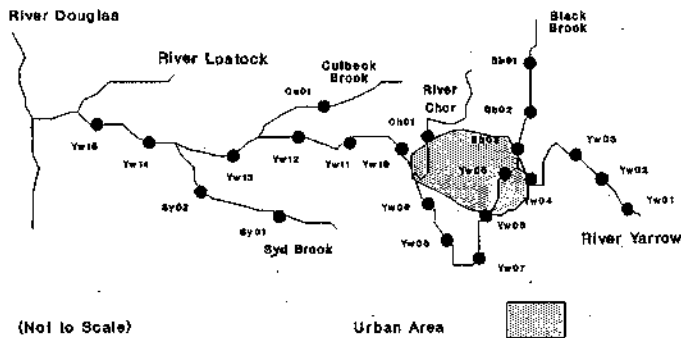
The River Yarrow System.



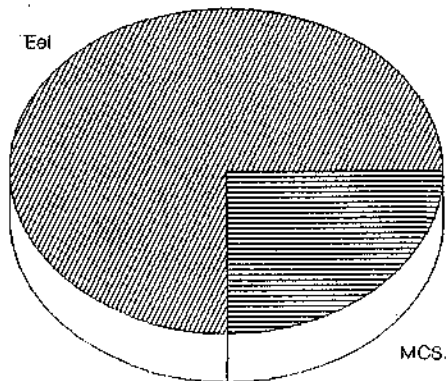
Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS.)	0	0
Trout	0	0
Total	0	0

Cu01 NGR. SD 538 188

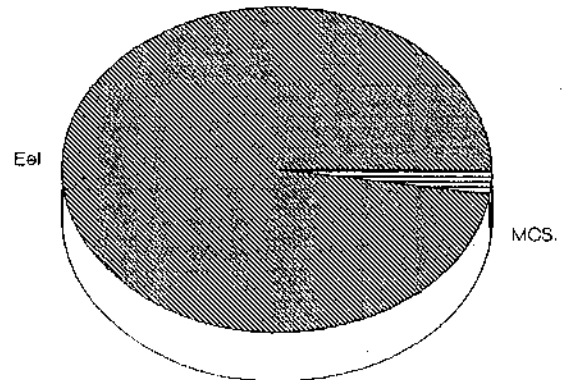
The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	21.60	2680.00
Flounder	0	0
Minor Coarse Sp. (MCS)	7.20	68.40
Trout	0	0
Total	28.80	2748.40



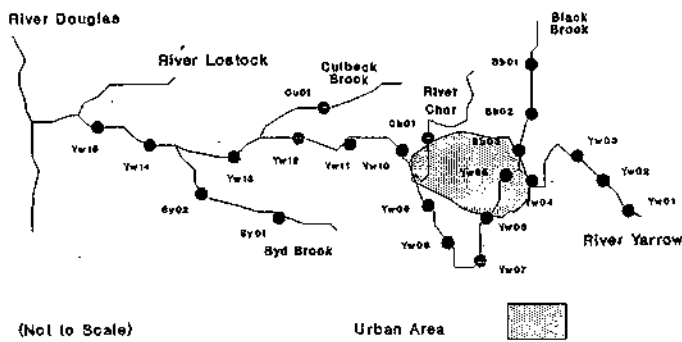
Population composition.



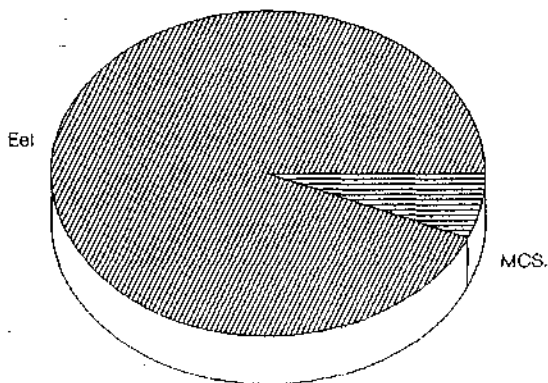
Biomass composition.

Sy01 NGR. SD 521 164

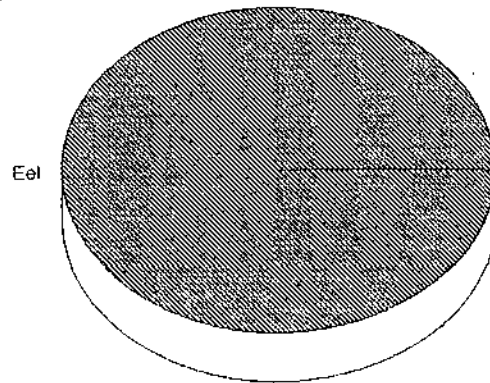
The River Yarrow System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	8.60	566.00
Flounder	0	0
Minor Coarse Sp. (MCS)	0.60	?
Trout	0	0
Total	9.20	566.00



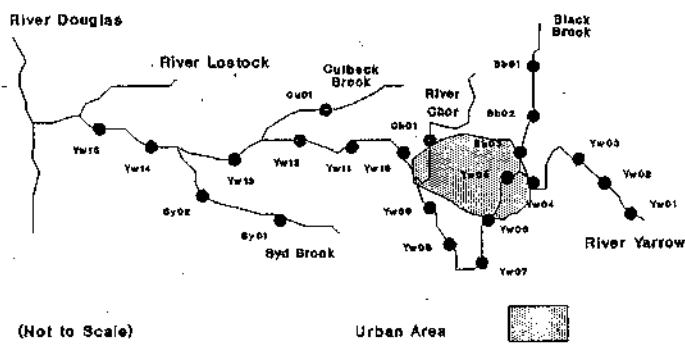
Population composition.



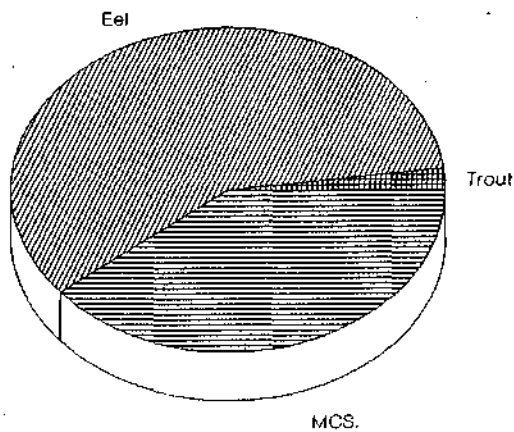
Biomass composition.

Sy02 NGR. SD 502 176

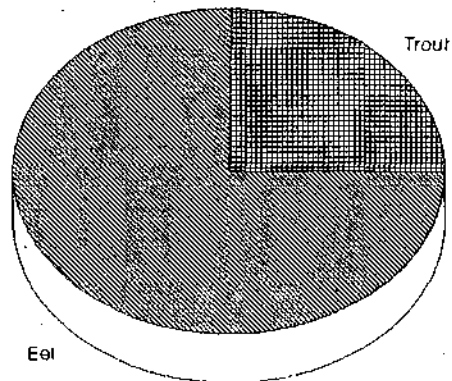
The River Yarrow System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	19.60	212.50
Flounder	0	0
Minor Coarse Sp. (MCS.)	9.00	?
Trout	0.50	70.00
Total	29.00	282.50



Population composition.



Biomass composition.

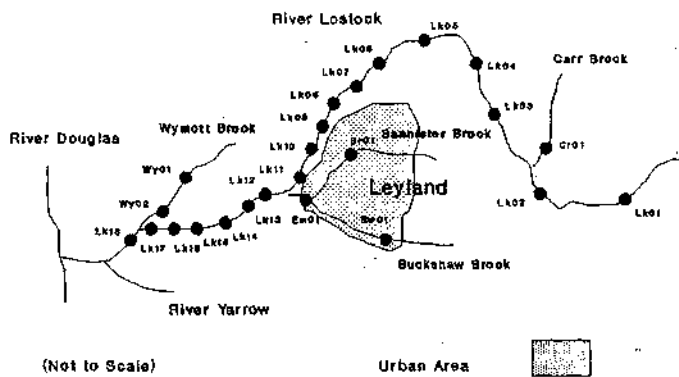
Appendix 3.

Site survey information

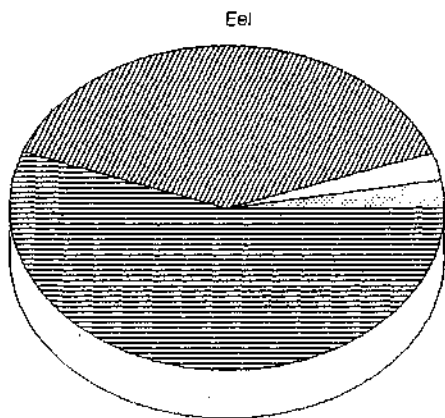
3C. River Lostock and Tributaries

Lk01 NGR. SD 593 215

The River Lostock System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0.66	10.60
Perch	0	0
Pike	0	0
Gudgeon	0.66	20.68
Bream	0	0
Tench	0	0
Carp	0	0
Eel	9.30	1266.60
Flounder	0	0
Minor Coarse Sp. (MCS)	13.33	54.66
Trout	0	0
Total	23.95	1362.62

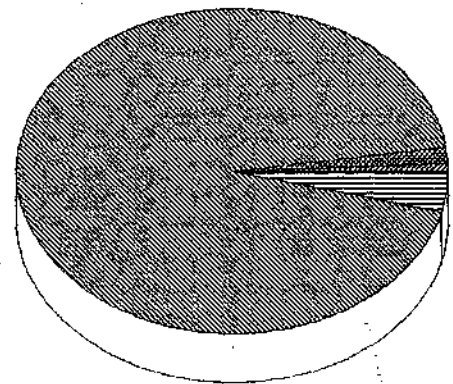


MCS

Population composition.

Gudgeon
Roach

Eel



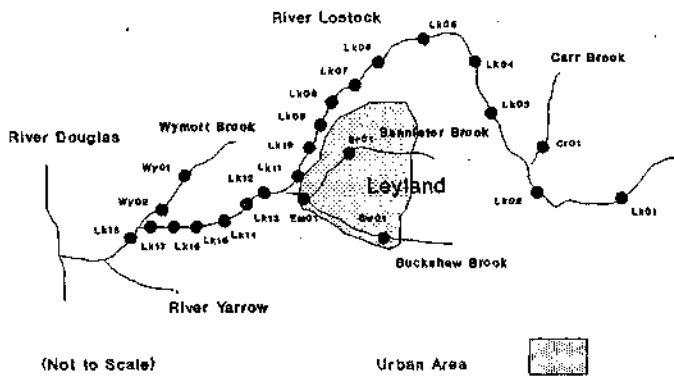
Gudgeon
Roach

MCS

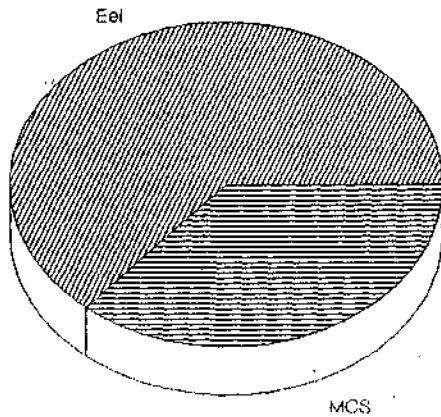
Biomass composition.

Lk02 NGR. SD 577 213

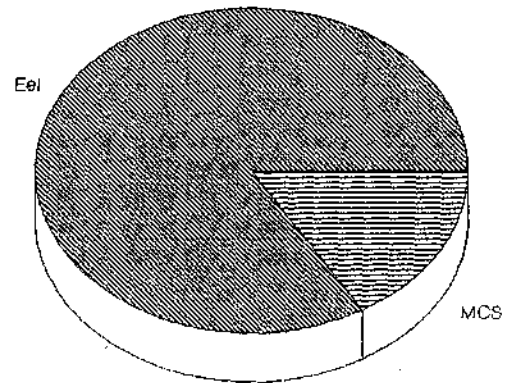
The River Lostock System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	4.66	640.00
Flounder	0	0
Minor Coarse Sp. (MCS)	2.66	128.00
Trout	0	0
Total	7.32	768.00



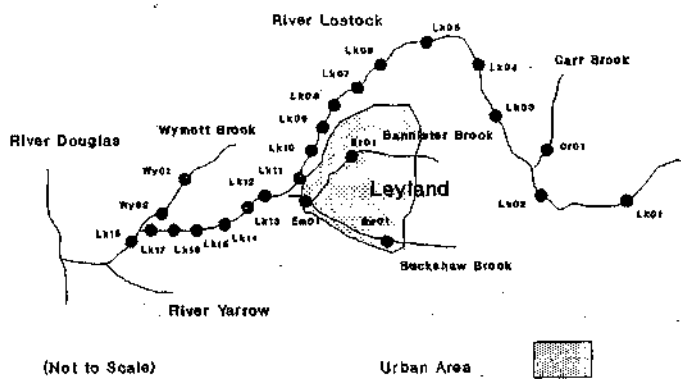
Population composition.



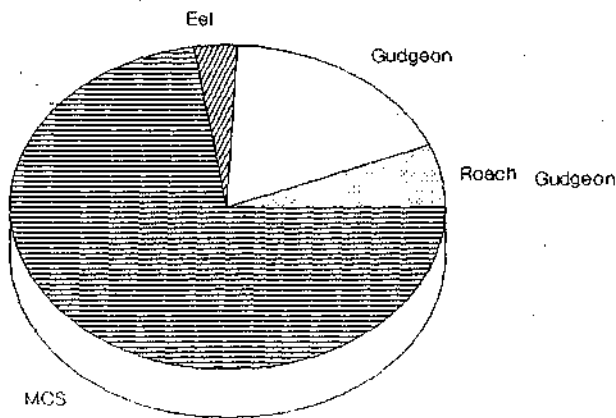
Biomass composition.

LK03 NGR. SD 568 231

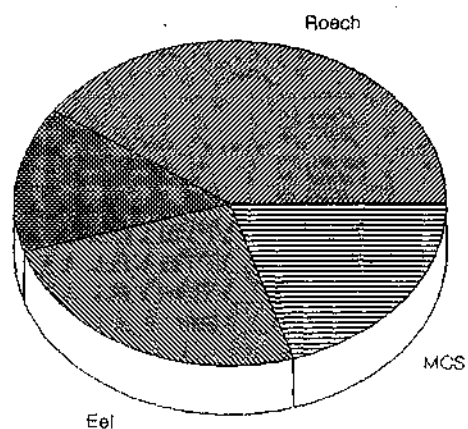
The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	2.00	254.33
Perch	0	0
Pike	0	0
Gudgeon	6.86	92.00
Bream	0	0
Tench	0	0
Carp	0	0
Eel	1.00	157.66
Flounder	0	0
Minor Coarse Sp. (MCS)	22.95	128.70
Trout	0	0
Total	30.61	632.70



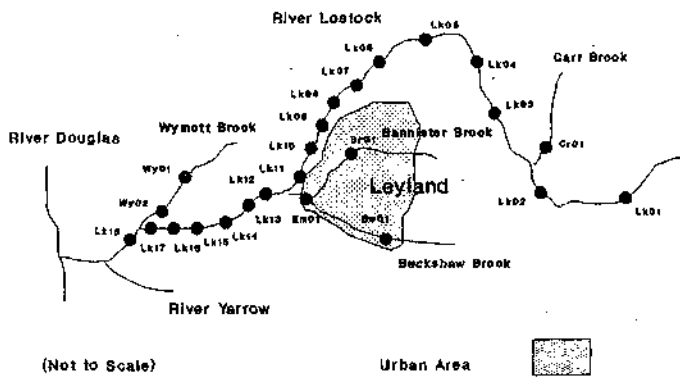
Population composition.



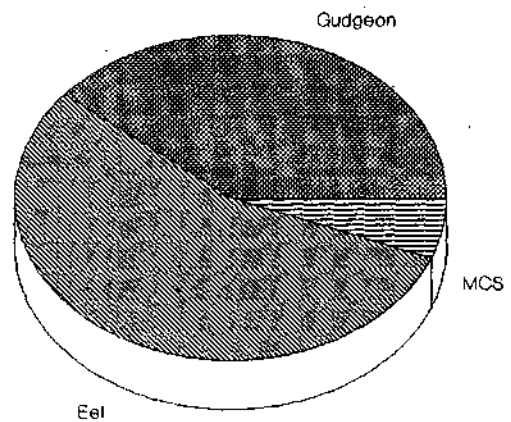
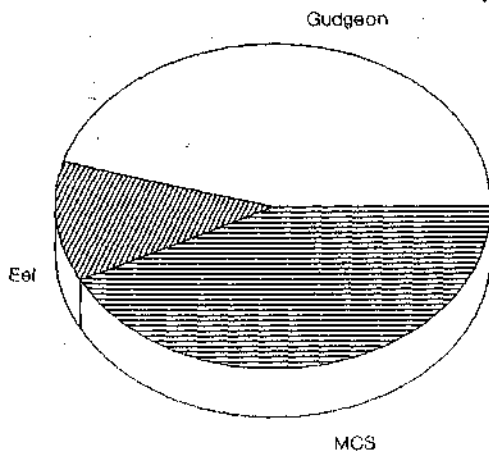
Biomass composition.

Lk04 NGR. SD 568 241

The River Lostock System.

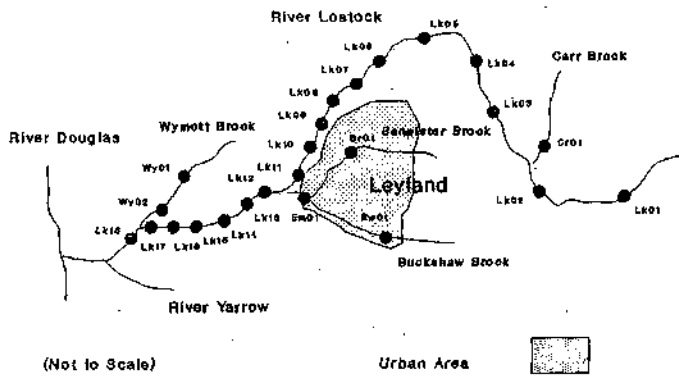


Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	21.00	355.00
Bream	0	0
Tench	0	0
Carp	0	0
Eel	5.50	501.00
Flounder	0	0
Minor Coarse Sp. (MCS)	19.50	55.50
Trout	0	0
Total	46.00	911.50

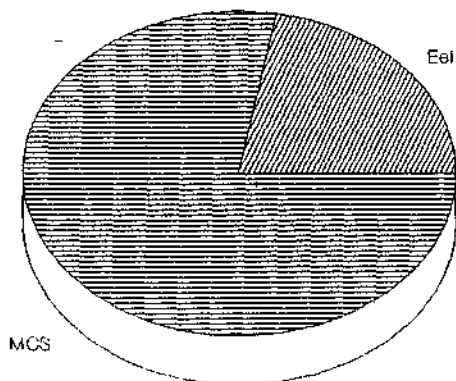


Lk05 NGR. SD 555 254

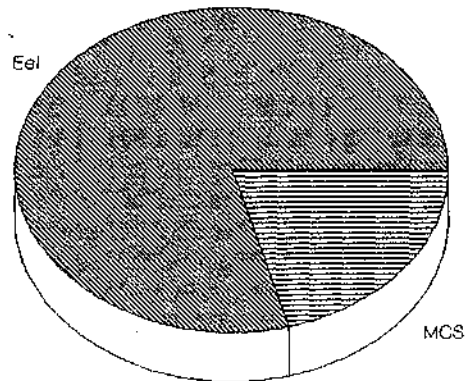
The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	2.66	202.60
Flounder	0	0
Minor Coarse Sp. (MCS)	9.30	63.30
Trout	0	0
Total	11.96	256.90



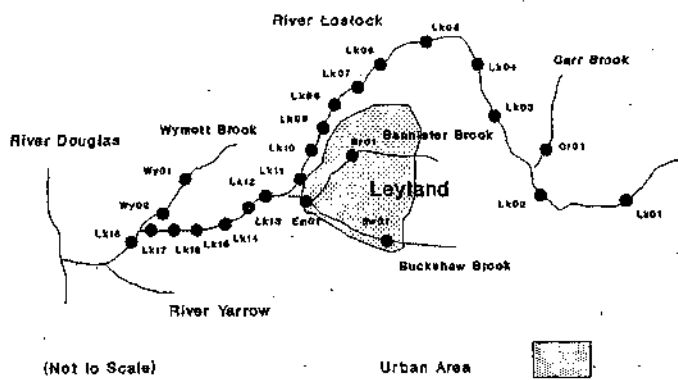
Population composition.



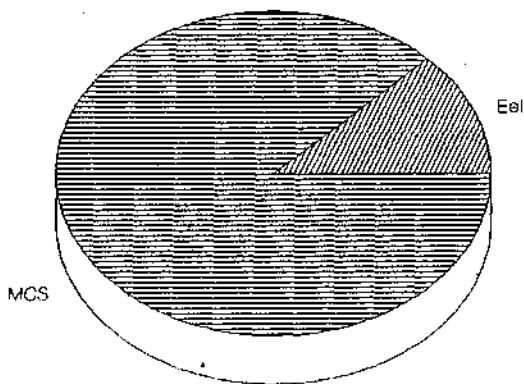
Biomass composition.

Lk06 NGR. SD 540 248

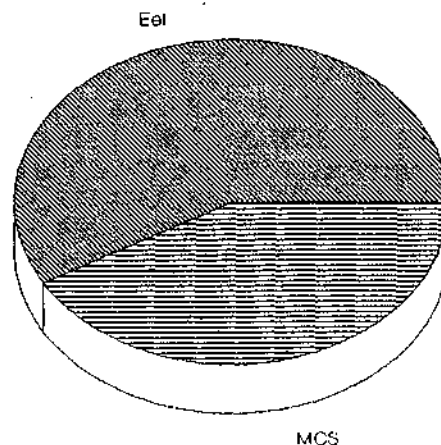
The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roech	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	4.00	290.20
Flounder	0	0
Minor Coarse Sp. (MCS)	27.99	207.99
Trout	0	0
Total	31.99	498.19



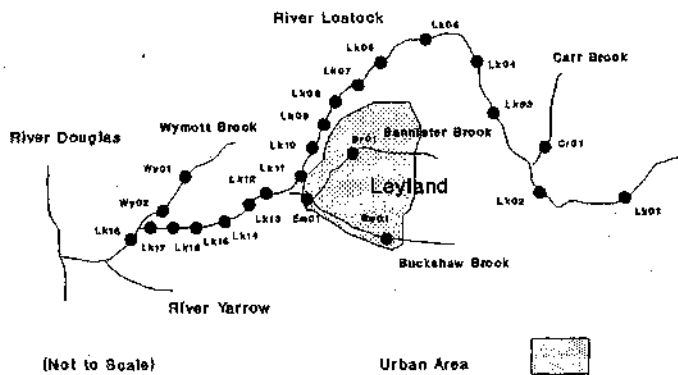
Population composition.



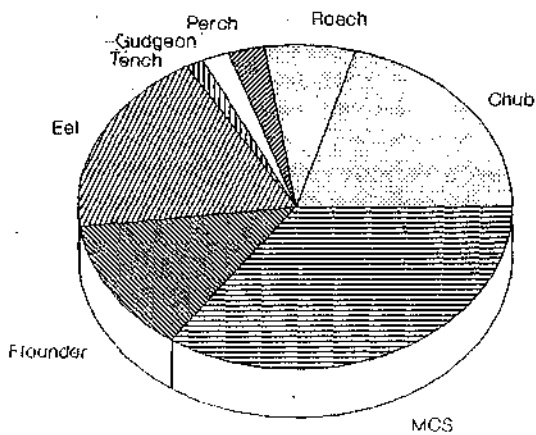
Biomass composition.

Lk07 NGR. SD 535 235

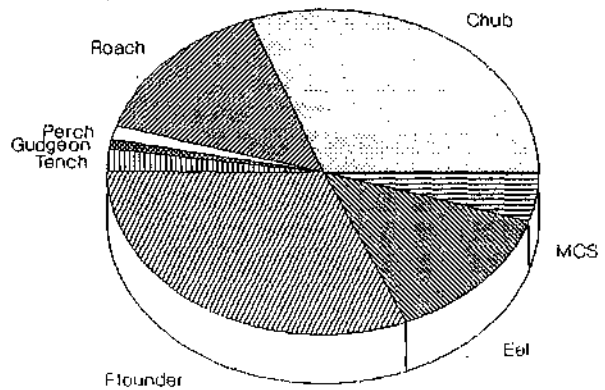
The River Lostock System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	15.50	994.50
Dace	0	0
Roach	5.00	483.50
Perch	2.00	45.50
Pike	0	0
Gudgeon	1.50	31.50
Bream	0	0
Tench	1.00	72.00
Barbel	0	0
Eel	14.00	455.70
Flounder	10.00	1016.50
Minor Coarse Sp. (MCS)	26.00	127.17
Trout	0	0
Total	74.50	3257.15



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: River Lostock Site code: Lk08
River System: River Lostock Dated fished: 27.07.95
Location: Below Farrington Bridge N.G.R. SD 535 233

Habitat features

Length (m): 50 Mean width (m): 3
Area (m²): 150 Mean depth (m): 0.5
Gradient (m/Km): 4.0 Max. depth (m): 1.0

Water level: low summer flow

Site description: 50% Pool 30% Glide 20% Riffle

Adjacent land use: Urban area and parkland

Method: Three runs of fully quantitative upstream electric fishing, 2 anodes, pulsed DC (50V), wading, with upstream and downstream stopnets.

Fishery Classification (level 3)

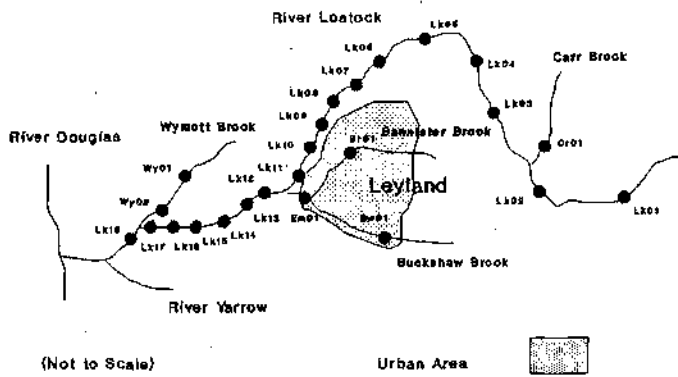
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	A	a

Comments

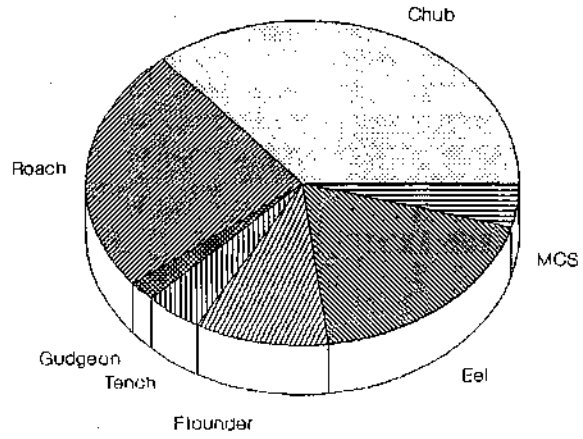
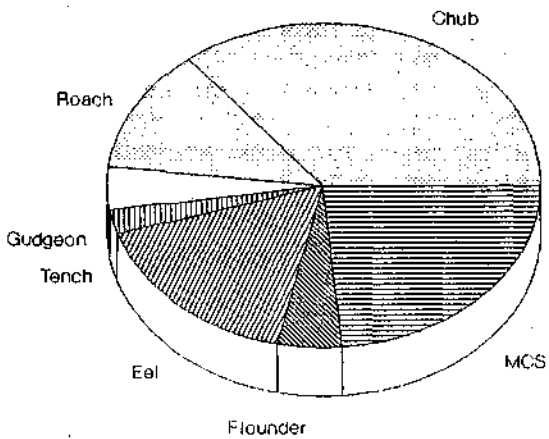
A mixed coarse fish population of chub, roach, dace, gudgeon, tench, flounder, eel, stone loach and stickleback were caught at this site.

Lk08 NGR. SD 535 233

The River Lostock System.

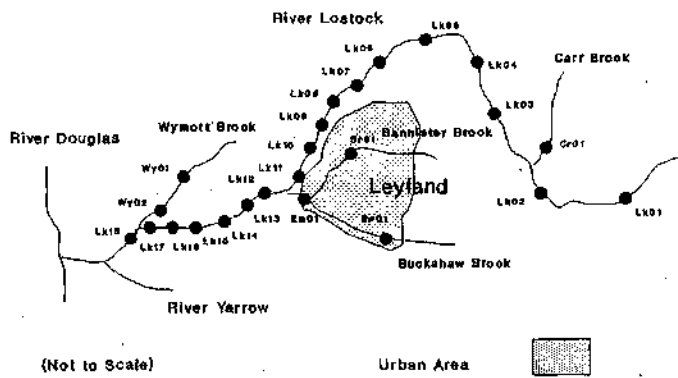


Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	50.00	2610.00
Dace	0	0
Roach	17.33	1771.00
Perch	0	0
Pike	0	0
Gudgeon	6.00	143.33
Bream	0	0
Tench	3.33	307.03
Barbel	0	0
Eel	23.33	1353.90
Flounder	6.67	720.36
Minor Coarse Sp. (MCS)	28.00	315.94
Trout	0	0
Total	134.66	7221.66

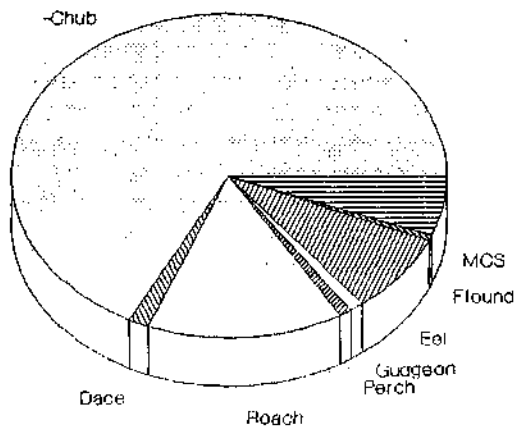


Lk09 NGR. SD 529 228

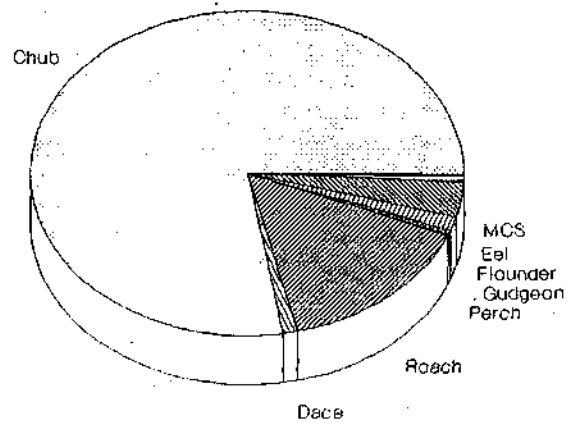
The River Lostock System.



Species.	Density (N/100m ³)	Biomass (g/100m ³)
Chub	67.50	6234.00
Dace	1.50	85.50
Roach	14.50	1210.50
Perch	1.00	8.50
Pike	0	0
Gudgeon	1.00	37.50
Bream	0	0
Tench	0	0
Carp	0	0
Eel	8.00	285.50
Flounder	0.50	107.50
Minor Coarse Sp. (MCS)	6.00	60.50
Trout	0	0
Total	100.00	8029.50



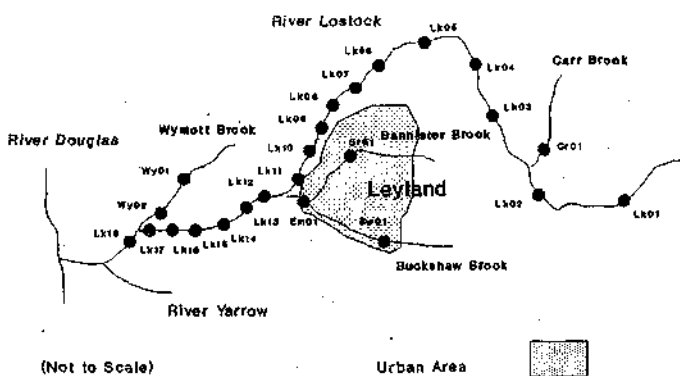
Population composition.



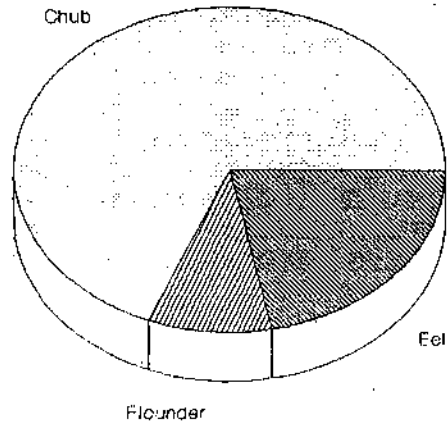
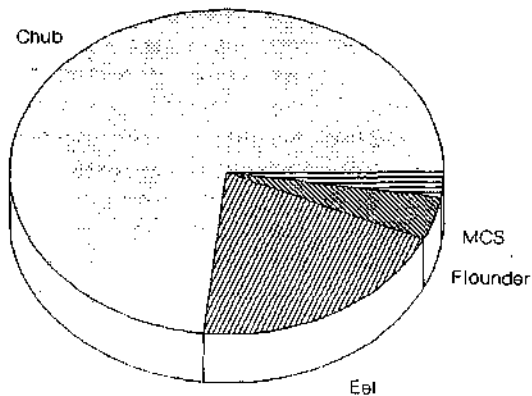
Biomass composition.

Lk10 NGR. SD 529 219

The River Lostock System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	56.63	2492.60
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	15.30	793.30
Flounder	3.33	336.00
Minor Coaræ Sp. (MCS)	2.00	?
Trout	0	0
Total	77.26	3621.90



SITE REPORT

Site Details

Watercourse: River Lostock
River System: River Lostock
Location: *Wade Hall*
Site code: Lk11
Date fished: 25.07.95
N.G.R. SD 524 211

Habitat features

Length (m): 50
Area (m²): 200
Gradient (m/Km): 2.8
Mean width (m): 4
Mean depth (m): 0.5
Max. depth (m): 0.7

Water level: low summer flow

Site description: 40% Pool 50% Glide 10% Riffle

Adjacent land use: Urban area.

Method: Upstream electric fishing, 2 anodes, pulsed DC. (50V), wading, with upstream stopnet.

Fishery Classification (level 3)

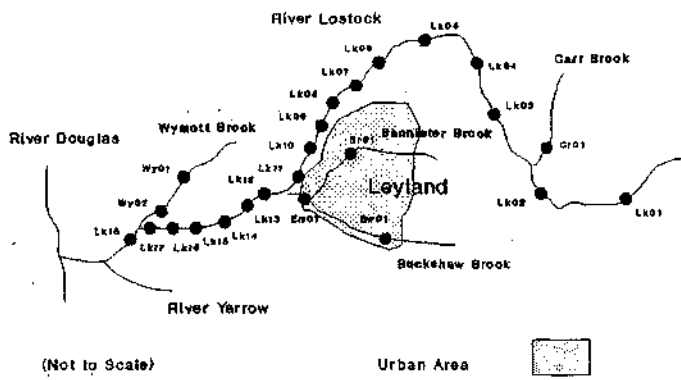
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	B	b

Comments

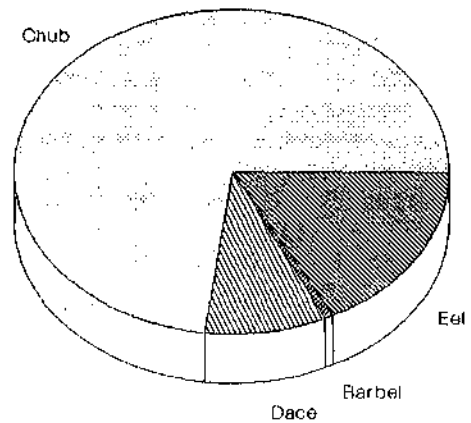
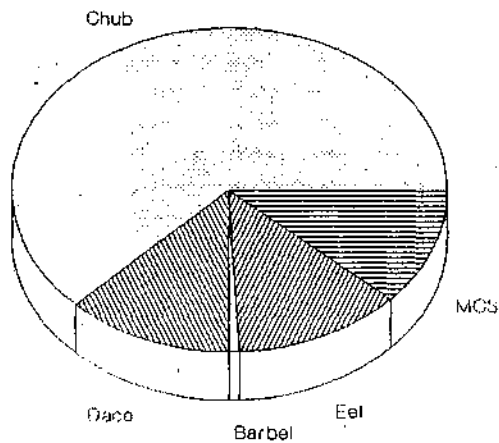
A coarse fish population of chub, dace, barbel, eel, stone loach and stickleback were caught at this site.

Lk11 NGR. SD 524 211

The River Lostock System.



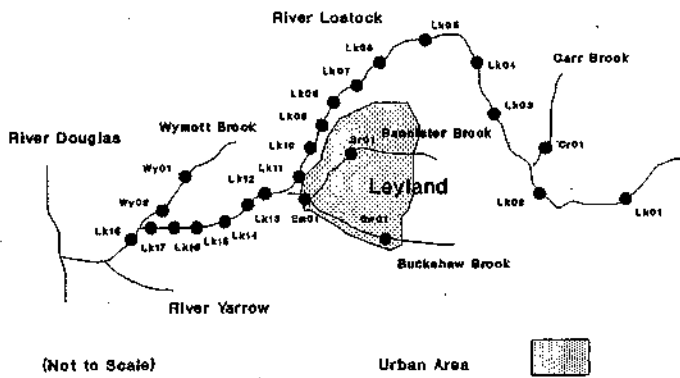
Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	40.00	1538.60
Dace	4.00	190.60
Roach	0	0
Percch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Barbel	0.50	13.50
Eel	8.00	368.60
Flounder	0	0
Minor Goarse Sp. (MCS)	7.50	?
Trout	0	0
Total	60.00	2107.00



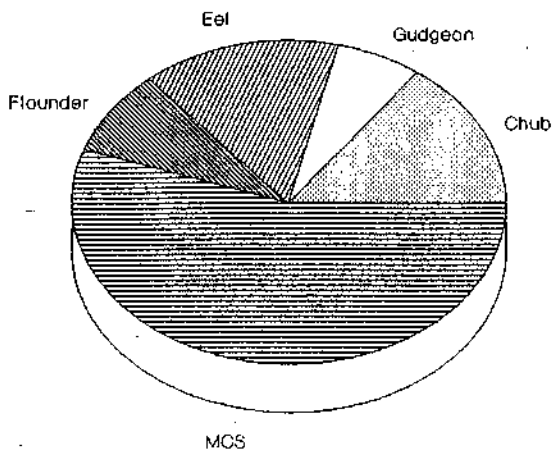
Lk12 NGR. SD 522 208

Pre-stocking Survey

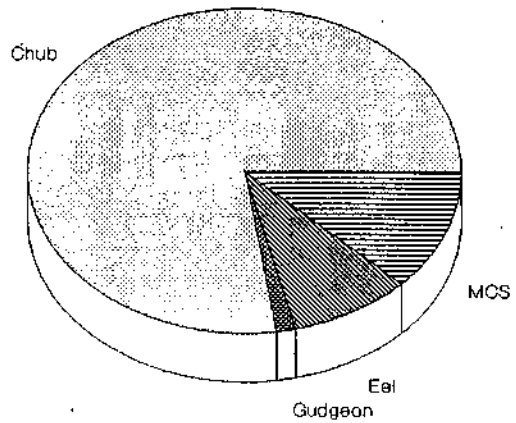
The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	1.25	426.79
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0.54	7.56
Bream	0	0
Tench	0	0
Carp	0	0
Eel	1.25	50.00*
Flounder	0.71	0
Minor Coarse Sp. (MCS)	4.84	67.48
Trout	0	0
Total	8.39	651.81



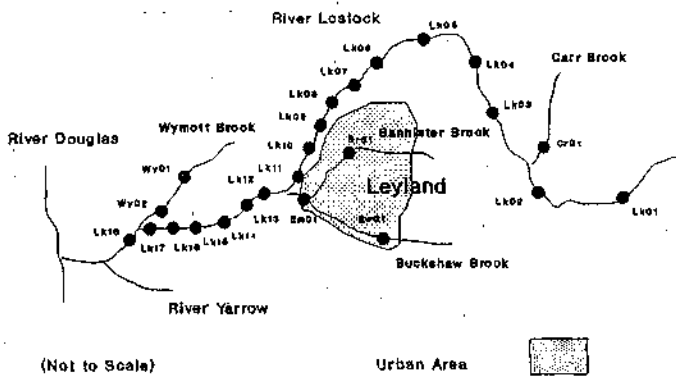
Population composition.



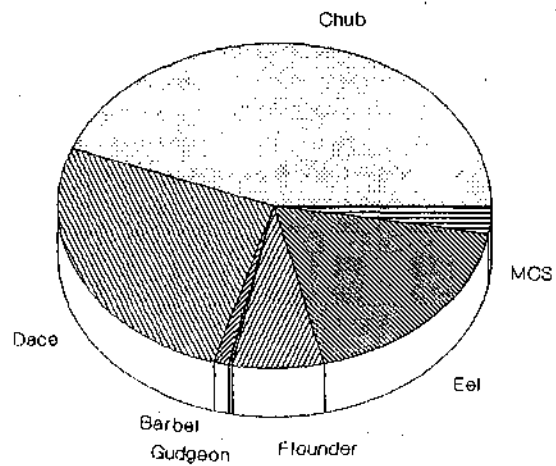
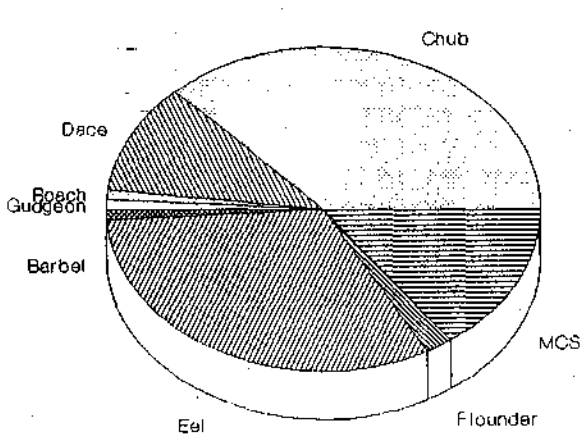
Biomass composition.

Lk12 NGR. SD 522 208

The River Lostock System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	16.50	1261.60
Dace	5.50	748.00
Roach	0.50	33.00
Perch	0	0
Pike	0	0
Gudgeon	0.50	1.60
Bream	0	0
Tenoh	0	0
Barbel	0.50	7.00
Eel	16.00	628.70
Flounder	1.00	194.50
Minor Coarse Sp. (MCS)	7.50	78.40
Trout	0	0
Total	50.00	2653.70



SITE REPORT

Site details

Watercourse: River Lostock, Site code: Lk13
River System: River Lostock Date fished: 26.07.95
Location: Below STW outfall N.G.R. SD 522 206

Habitat features

Length (m): 50 Mean width (m): 4
Area (m²): 200 Mean depth (m): 0.6
Gradient (m/Km): 2.8 Max. depth (m): 1.2

Water level: low summer flow

Site description: 30% Pool 70% Glide 00% Riffle

Adjacent land use: Urban area with parkland

Method: Three runs of fully quantitative upstream electric fishing, 2 anodes, pulsed DC (50V), wading, with upstream and downstream stopnets.

Fishery Classification (level 3)

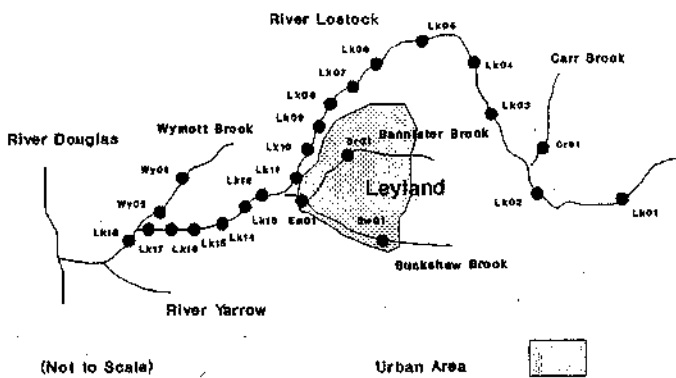
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	A	a

Comments

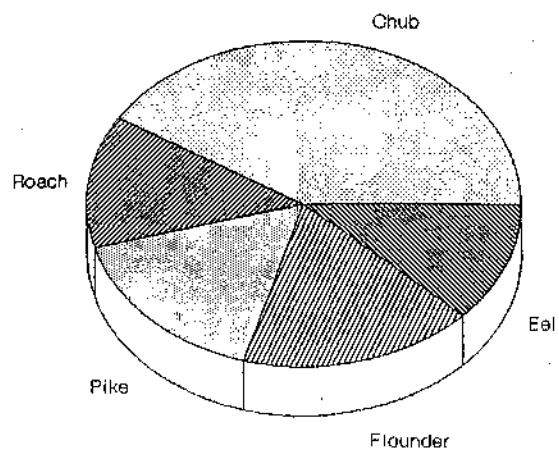
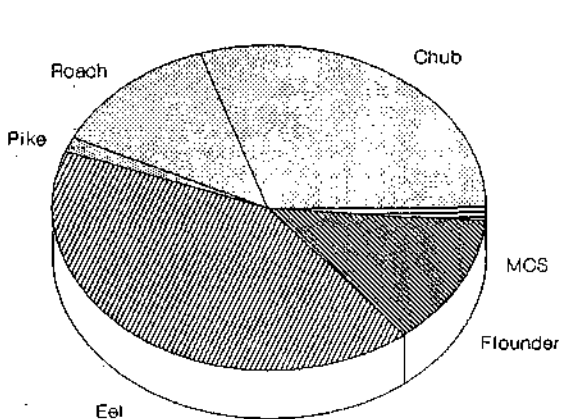
A coarse fish population of chub, pike, roach, eel, flounder and stickleback were caught at this site.

Lk13 NGR. SD 522 206

The River Lostock System.

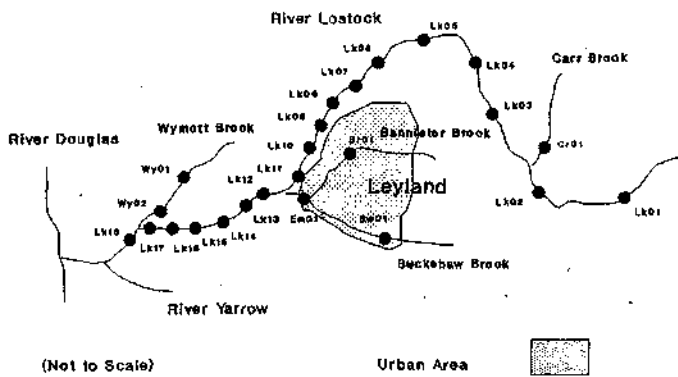


Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	10.50	1708.70
Dace	0	0
Roach	4.50	560.50
Perch	0	0
Pike	0.50	675.00
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	14.50	602.66
Flounder	4.50	725.60
Minor Coarse Sp. (MCS)	0.50	?
Trout	0	0
Total	35.00	4162.66

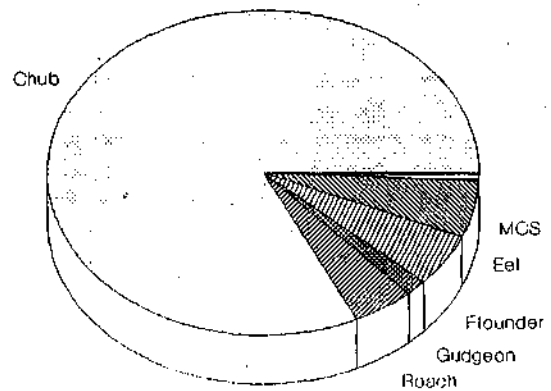
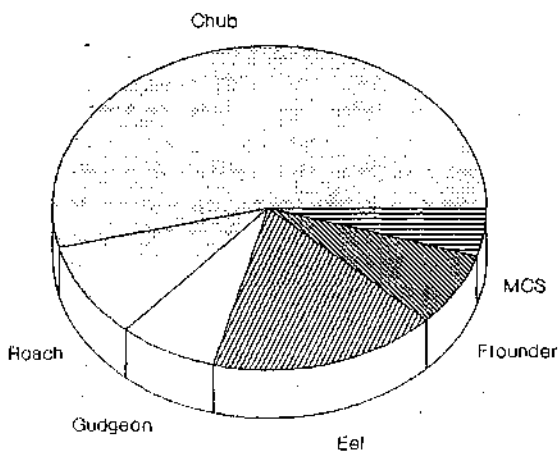


Lk14 NGR. SD 517 200

The River Lostock System.

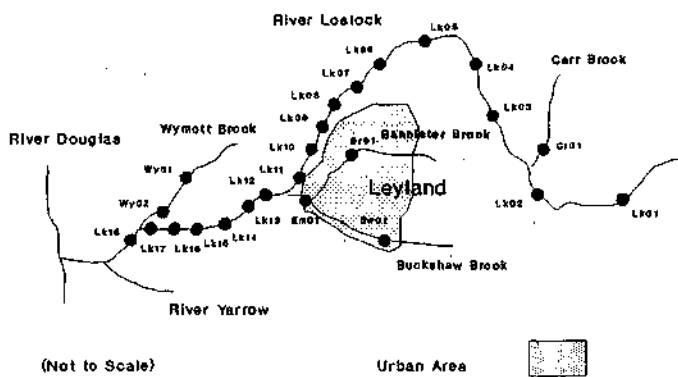


Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	14.60	1897.30
Daos	0	0
Roach	2.60	106.00
Perch	0	0
Pike	0	0
Gudgeon	2.00	37.30
Bream	0	0
Tench	0	0
Barbel	0	0
Eel	4.60	132.00
Flounder	2.00	122.00
Minor Coarse Sp. (MCS)	1.30	18.60
Trout	0	0
Total	27.10	2313.20

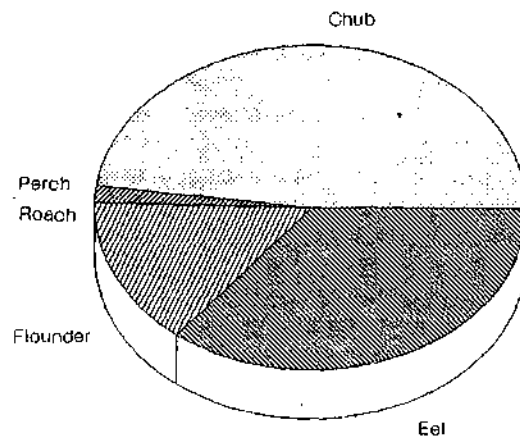
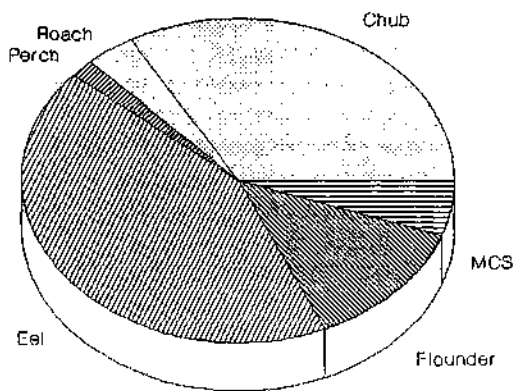


Lk15 NGR. SD 513 199

The River Lostock System.

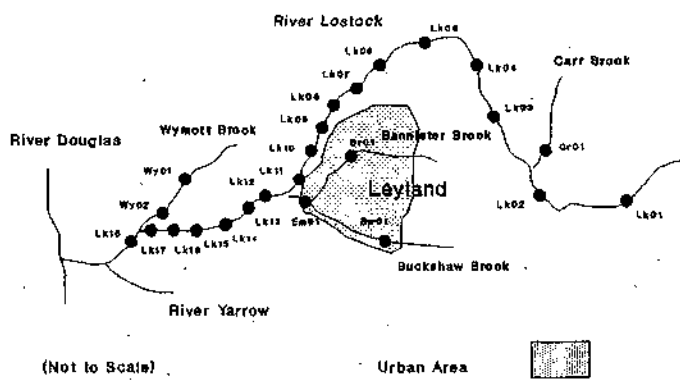


Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	5.00	564.50
Dace	0	0
Roach	0.89	19.58
Perch	0.44	1.92
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	10.22	421.70
Flounder	3.11	173.27
Minor Coarse Sp. (MCS)	1.33	?
Trout	0	0
Total	23.99	1190.40

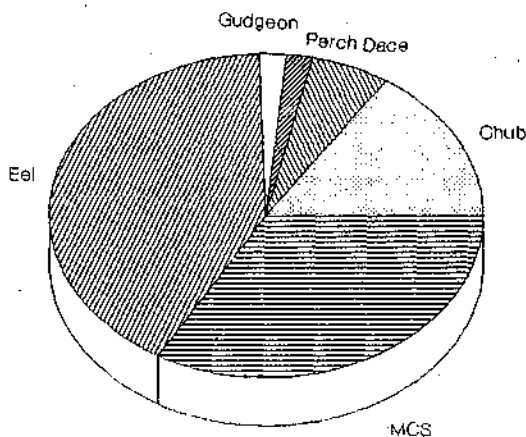


LK16 NGR. SD 512 199

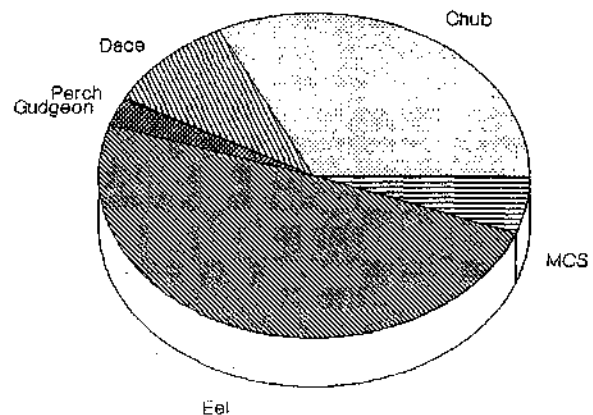
The River Lostock System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	4.44	280.30
Dace	1.87	86.70
Rosch	0	0
Perch	0.68	1.12
Pike	0	0
Gudgeon	0.56	23.50
Bream	0	0
Tench	0	0
Carp	0	0
Eel	11.67	429.50
Flounder	0	0
Minor Coarse Sp. (MCS)	9.44	49.98
Trout	0	0
Total	28.34	870.10



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: River Lostock

Site code: Lk17

River System: River Lostock

Date fished: 25.07.95

Location: Lostock Bridge

N.G.R. SD 508 198

Habitat features

Length (m): 50

Mean width (m): 4

Area (m²): 200

Mean depth (m): 0.6

Gradient (m/Km): 6.5

Max. depth (m): 1.0

Water level: low summer flow

Site description: 30% Pool 60% Glide 10% Riffle

Adjacent land use: Farmland

Method: Upstream electric fishing, 2 anodes, pulsed DC. (50V), wading, with upstream stopnet.

Fishery Classification (level 3)

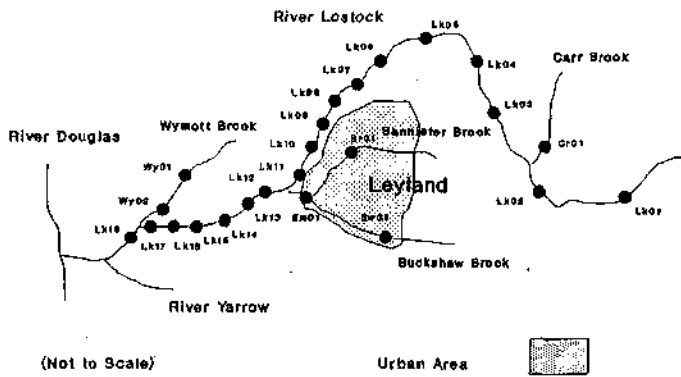
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	E	e

Comments

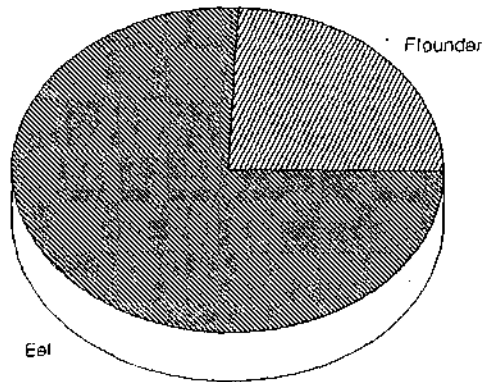
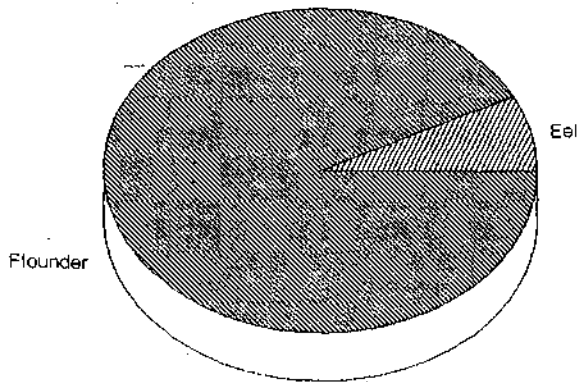
Flounder and eel only were caught at this site.

Lk17 NGR. SD 508 198

The River Lostock System.

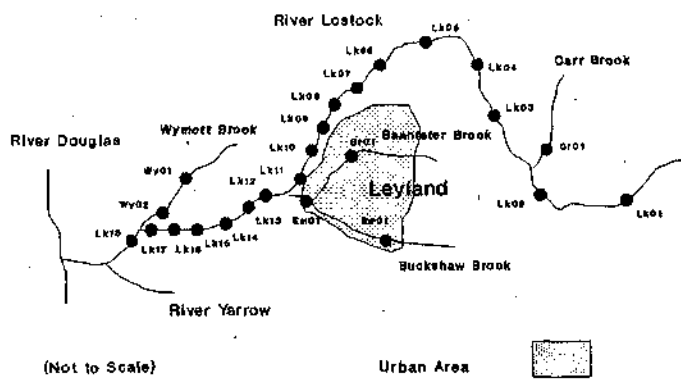


Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	3.50	132.00
Flounder	1.50	42.50
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	5.00	174.50

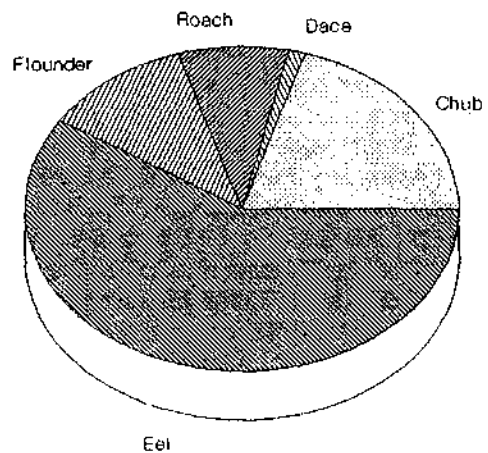
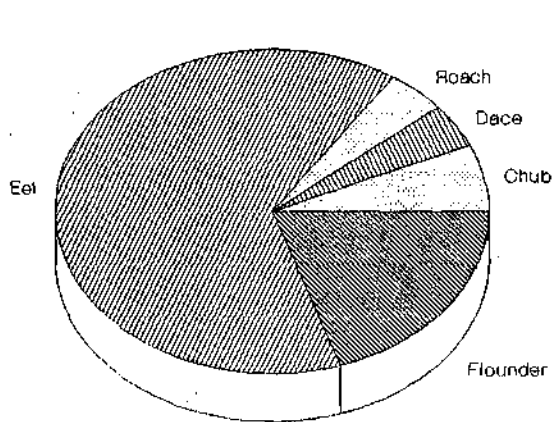


Lk18 NGR. SD 486 196

The River Lostock System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	1.50	222.00
Dace	1.50	19.50
Roach	1.00	90.00
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Barbel	0	0
Eel	14.50	648.00
Flounder	4.50	121.00
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	23.00	1094.50



SITE REPORT

Site details

Watercourse: Carr Beck
River System: River Lostock
Location: Clayton - le - Woods
Site code: Cr01
Date fished: 31.07.95
N.G.R. SD 580 228

Habitat features

Length (m): 50
Area (m²): 50
Gradient (m/Km): 14.3
Mean width (m): 1
Mean depth (m): 0.1
Max. depth (m): 0.2

Water level: low summer flow

Site description: 30% Pool 50% Glide 20 % Riffle

Adjacent land use: Urban area

Method: Upstream electric fishing, 1 anode, pulsed DC. (50V), wading, with upstream stopnet.

Fishery Classification (level 3)

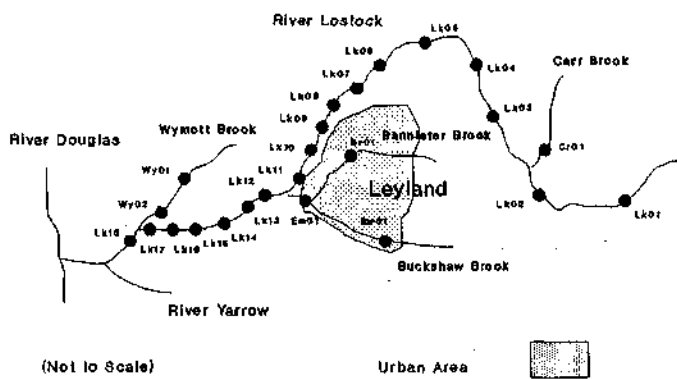
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	F	e

Comments

Stickleback only were caught at this site.

Cr01 NGR. SD 580 228

The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Daace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	8.00	?
Trout	0	0
Total	8.00	0

SITE REPORT

Site details

Watercourse: Bannister Brook

Site code: B701

River System: River Lostock

Date fished: 31.07.95

Location: Leyland Printing Co.

N.G.R. SD 4528 217

Habitat features

Length (m): 50

Mean width (m): 1

Area (m²): 50

Mean depth (m): 0.2

Gradient (m/Km): 7.4

Max. depth (m): 0.3

Water level: low summer flow

Site description: 40% Pool 60% Glide 00% Riffle

Adjacent land use: Urban area

Method: Upstream electric fishing, 1 anode, pulsed DC. (50V), wading, with upstream stopnet.

Fishery Classification (level 3)

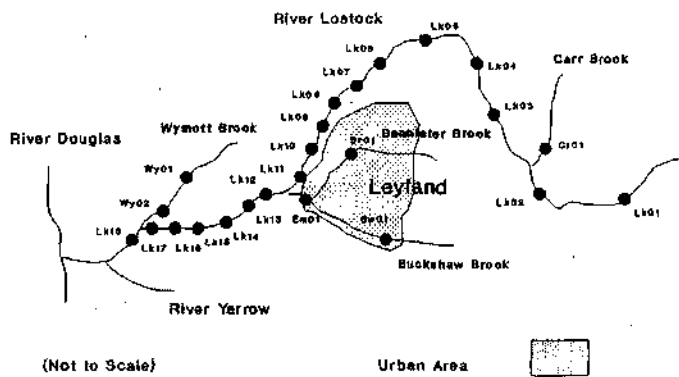
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	D	e

Comments

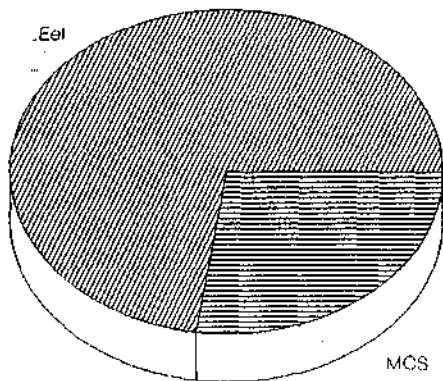
Stickleback and eels only were caught at this site.

Br01 NGR. SD 528 217

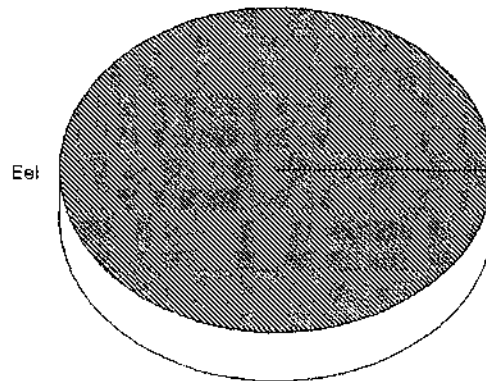
The River Lostock System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Barbel	0	0
Eel	18.00	746.00
Flounder	0	0
Minor Coarse Sp. (MCS)	6.00	?
Trout	0	0
Total	22.00	746.00



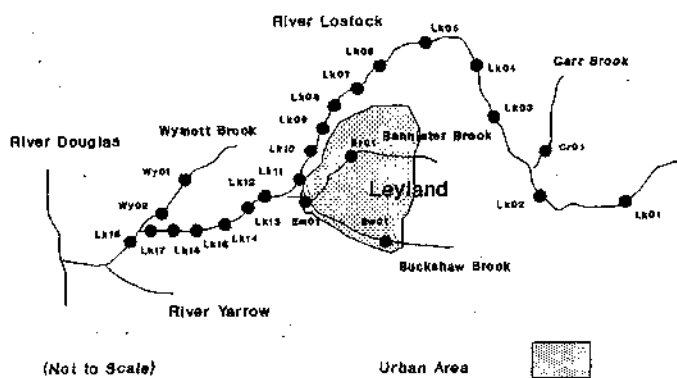
Population composition.



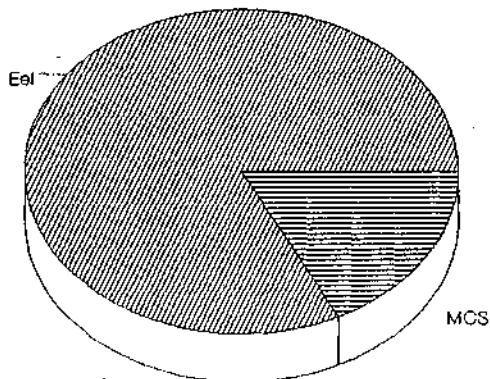
Biomass composition.

Bw01 NGR. SD 539 206

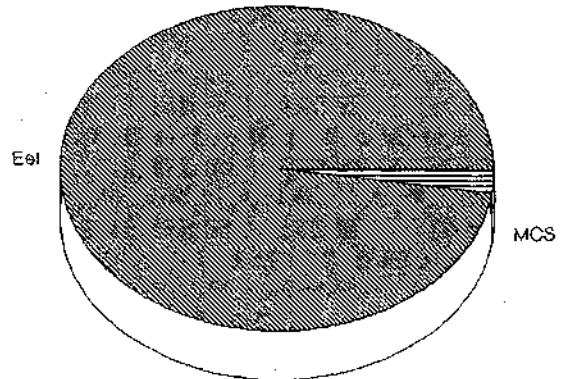
The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	0
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Barbel	0	0
Eel	17.50	1706.00
Flounder	0	0
Minor Coarse Sp. (MCS)	3.75	42.50
Trout	0	0
Total	21.25	1747.50



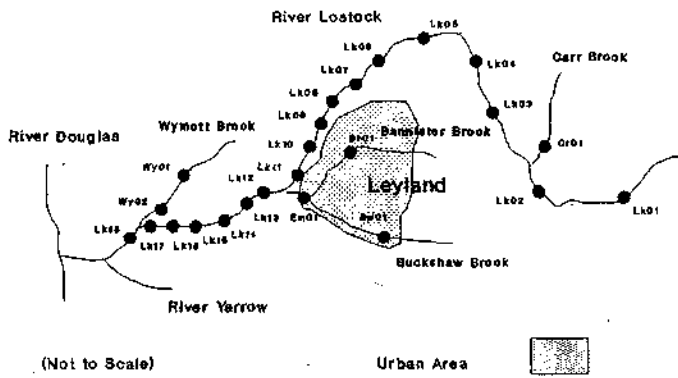
Population composition.



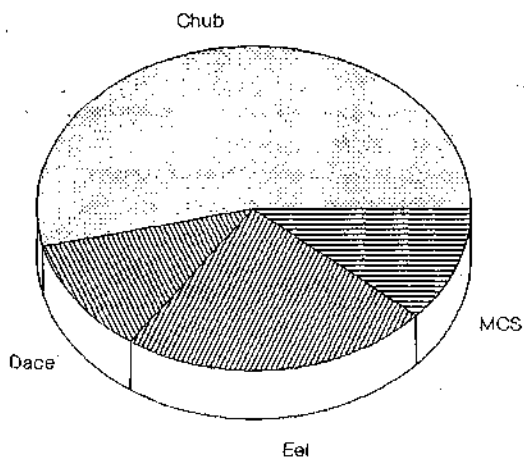
Biomass composition.

Em01 NGR. SD 524 214

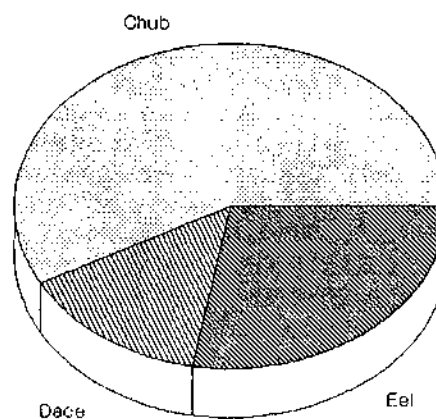
The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	28.00	1198.00
Dace	6.00	295.00
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Barbel	0	0
Eel	12.00	577.00
Flounder	0	0
Minor Coarse Sp. (MCS)	6.00	91.00
Trout	0	0
Total	52.00	2161.00



Population composition.



Biomass composition.

SITE REPORT

Site details

Watercourse: Wymott Beck

Site code: Wy01

River System: River Lostock

Date fished: 11.07.95

Location: *Hm Peison*

N.G.R. SD 498 213

Habitat features

Length (m): 50

Mean width (m): 3.5

Area (m²): 175

Mean depth (m): 1.0

Gradient (m/Km): 5.0

Max. depth (m): 1.5

Water level: low summer flow

Site description: 40% Pool 60% Glide 00% Riffle

Adjacent land use: Farmland

Method: Upstream electric fishing, 1 anode, pulsed DC. (50V), wading, with upstream stopnet.

Fishery Classification (level 3)

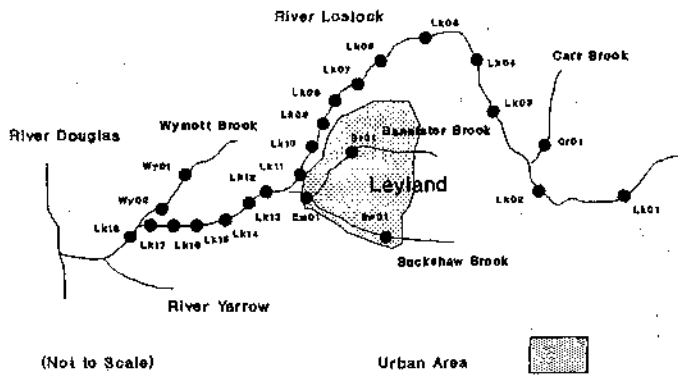
	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	E	b

Comments

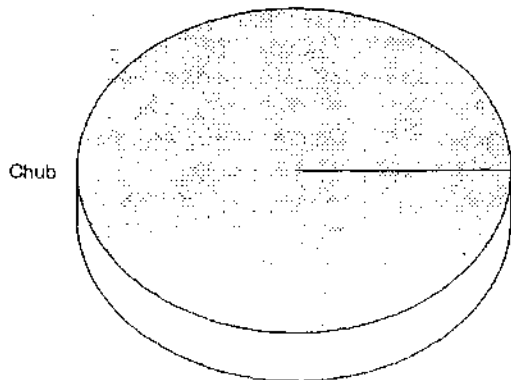
A single chub of length 130mm was caught at this site.

Wy01 NGR. SD 498 213

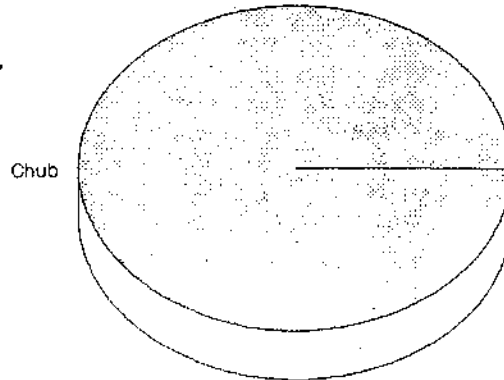
The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0.57	16.57
Dace	0	0
Roach	0	0
Perch	0	0
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Barbel	0	0
Eel	0	0
Flounder	0	0
Minor Coarse Sp. (MCS)	0	0
Trout	0	0
Total	0.57	16.57



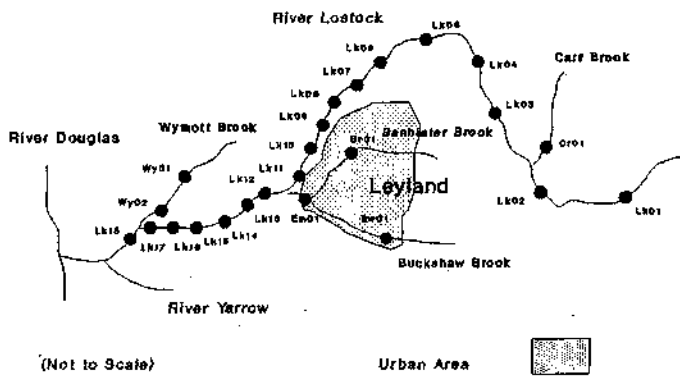
Population composition.



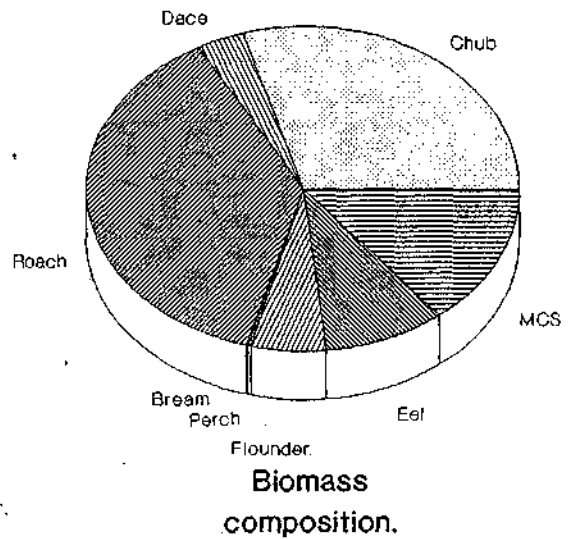
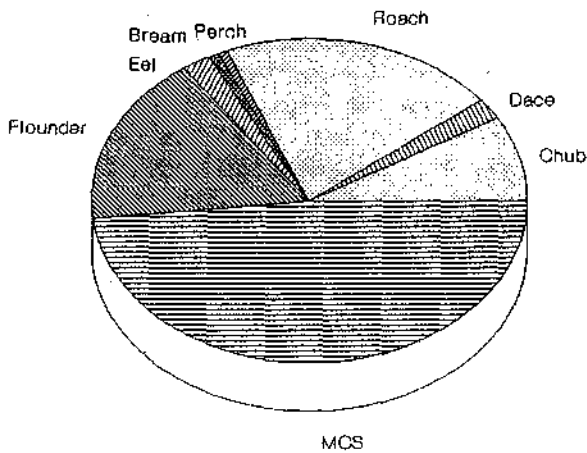
Biomass composition.

Wy02 NGR. SD 488 197

The River Lostock System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	8.00	158.67
Dace	2.00	18.67
Roach	19.33	201.33
Perch	0.67	0.87
Pike	0	0
Gudgeon	0	0
Bream	0.67	1.33
Tench	0	0
Barbel	0	0
Eel	2.00	49.33
Flounder	18.00	30.00
Minor Coarse Sp. (MCS)	45.33	76.00
Trout	0	0
Total	94.00	535.00



Appendix 3.

Pre-stocking survey information

3D River Lostock

SITE REPORT

Pre-stocking Survey

Site details

Watercourse: River Lostock	Site code: Lk07
River System: River Lostock	Date fished: 24.03.95
Location: Above Farrington Bridge	N.G.R. SD 540 248

Habitat features

Length (m):	70	Mean width (m):	8
Area (m ²):	560	Mean depth (m):	0.3
Gradient (m/Km):	4.0	Max. depth (m):	0.7

Water level: low summer flow

Site description: 00% Pool 90% Glide 10 % Riffle

Adjacent land use: Urban area and parkland

Method : Three runs of fully quantitative upstream electric fishing, 2 anodes, pulsed DC (20V), wading, with upstream and downstream stopnets.

Fishery Classification (level 3)

	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	C	b

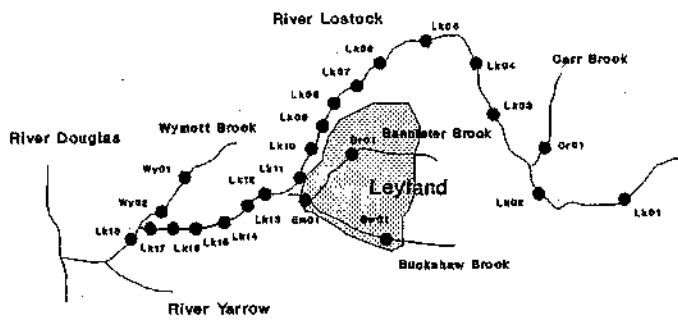
Comments

A mixed coarse fish population of chub, roach, perch, dace, eel, stone loach and stickleback were caught at this site.

Lk07 NGR. SD 535 235

Pre-stocking Survey

The River Lostock System.

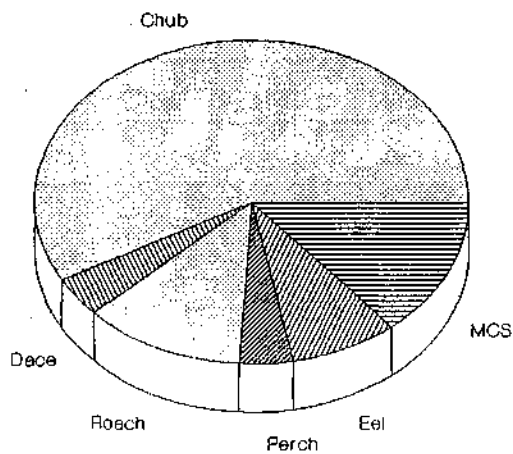


(Not to Scale)

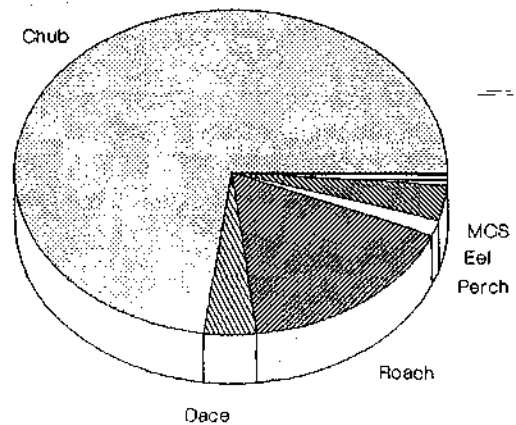
Urban Area



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	7.25	1013.02
Dace	0.50	54.75
Roach	1.50	233.75
Perch	0.50	21.50
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	1.00	60.00
Flounder	0	0
Minor Coarse Sp. (MCS)	1.75	16.14
Trout	0	0
Total	12.50	1391.16



Population composition.



Biomass composition.

SITE REPORT

Pre-stocking Survey

Site details

Watercourse: River Lostock	Site code: Lk08
River System: River Lostock	Date fished: 24.03.95
Location: Below Farrington Bridge	N.G.R. SD 535 233

Habitat features

Length (m): 50	Mean width (m): 8
Area (m ²): 400	Mean depth (m): 0.4
Gradient (m/Km): 4.0	Max. depth (m): 0.5

Water level: low summer flow

Site description: 20% Pool 60% Glide 20 % Riffle

Adjacent land use: Urban area and parkland

Method : Three runs of fully quantitative upstream electric fishing, 2 anodes, pulsed DC (20V), wading, with upstream and downstream stopnets.

Fishery Classification (level 3)

	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	C	a

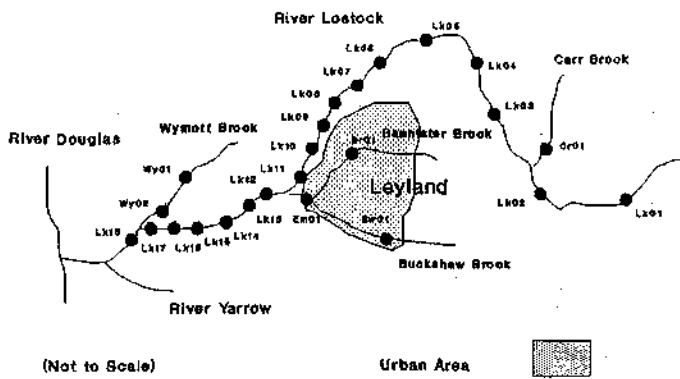
Comments

A mixed coarse fish population of chub, roach, dace, gudgeon, tench, carp, minnow, perch, eel, stone loach and stickleback were caught at this site

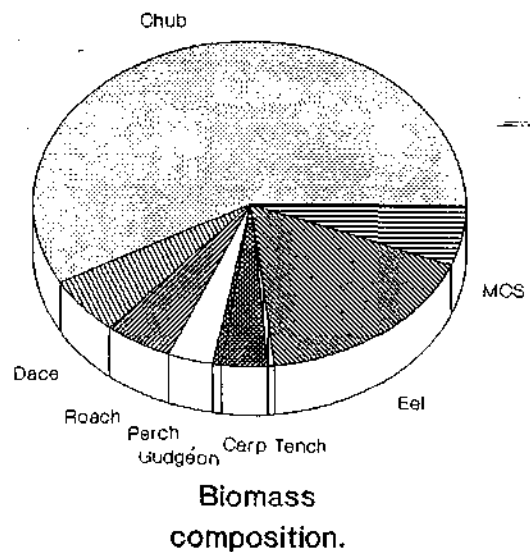
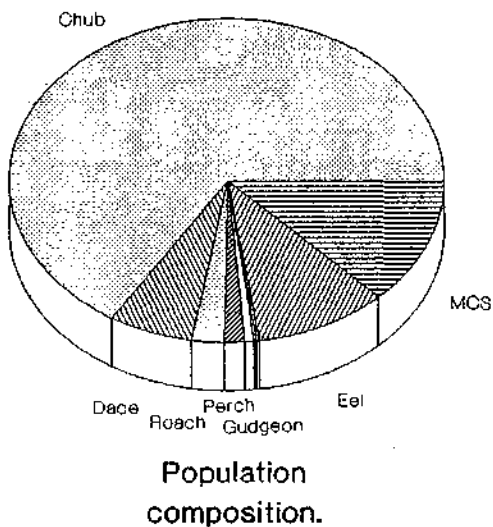
Lk08 NGR. SD 535 233

Pre-stocking Survey

The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	63.75	1113.32
Dace	6.04	109.88
Roach	2.29	98.05
Perch	1.46	63.41
Pike	0	0
Gudgeon	0.63	12.50
Bream	0	0
Tench	0.21	10.42
Carp	0.21	65.83
Eel	9.58	330.00*
Flounder	0	0
Minor Coarse Sp. (MCS)	12.30	116.64
Trout	0	0
Total	96.47	1918.95



SITE REPORT

Pre-stocking Survey

Site details

Watercourse: River Lostock	Site code: Lk13
River System: River Lostock	Date fished: 04.04.95
Location: Below STW outfall	N.G.R. SD 522 206

Habitat features

Length (m): 60	Mean width (m): 6
Area (m ²): 240	Mean depth (m): 0.2
Gradient (m/Km): 2.8	Max. depth (m): 0.6

Water level: low summer flow

Site description: 00% Pool 100% Glide 00 % Riffle

Adjacent land use: Urban area with parkland

Method: Three runs of fully quantitative upstream electric fishing, 2 anodes, pulsed DC. (20V), wading, with upstream and downstream stopnets.

Fishery Classification (level 3)

	Absolute Classification	Relative Classification
Salmonids	F	e
Coarse	C	c

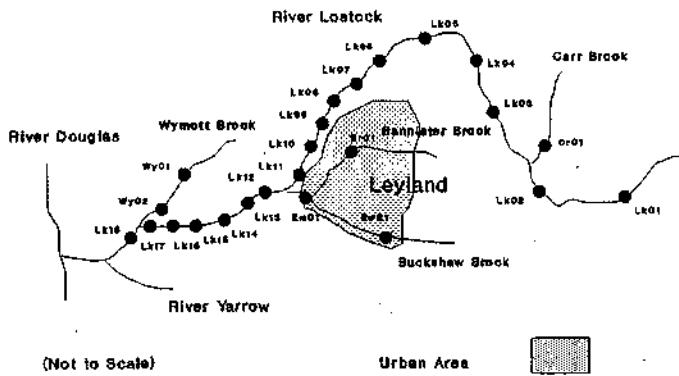
Comments

A coarse fish population of chub, pike, perch, eel, flounder, gudgeon, and stone loach were caught at this site

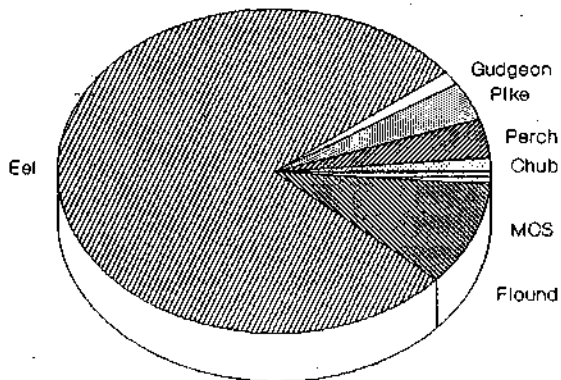
Lk13 NGR. SD 522 206

Pre-stocking Survey

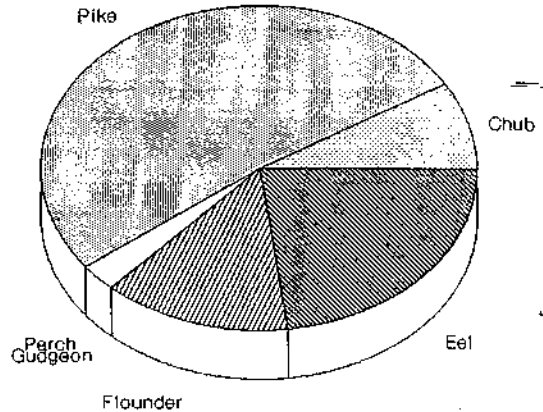
The River Lostock System.



Species	Density (N/100m ³)	Biomass (g/100m ³)
Chub	0.17	113.33
Dace	0	0
Roach	0	0
Perch	0.50	35.00
Pike	0.50	671.67
Gudgeon	0.17	2.33
Bream	0	0
Tench	0	0
Carp	0	0
Eel	10.00	300.00
Flounder	1.33	179.72
Minor Coarse Sp. (MCS)	0.17	0
Trout	0	0
Total	12.84	1302.05



Population composition.

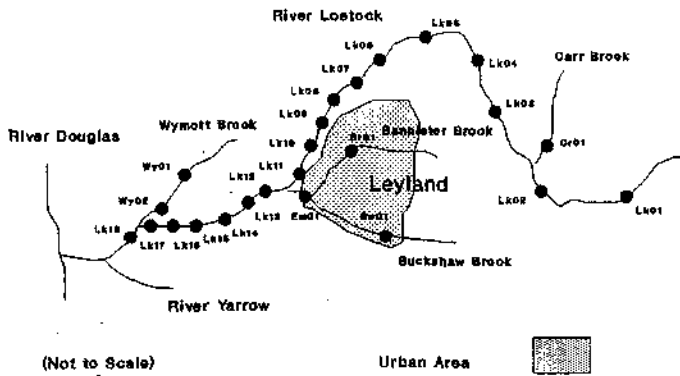


Biomass composition.

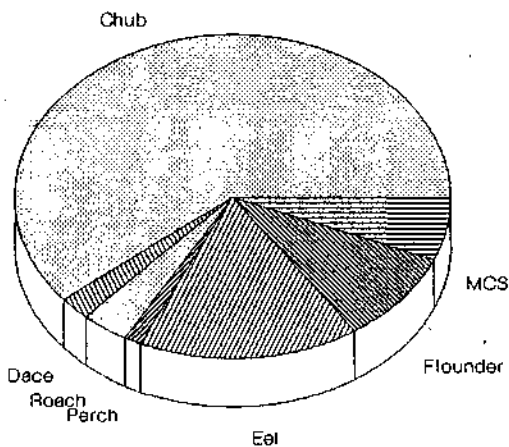
LK15 NGR. SD 513 199

Pre-stocking Survey

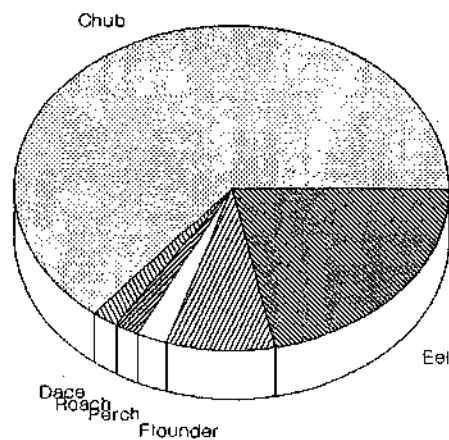
The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	7.20	381.00
Dace	0.30	11.25
Roach	0.42	11.26
Perch	0.14	18.20
Pike	0	0
Gudgeon	0	0
Bream	0	0
Tench	0	0
Carp	0	0
Eel	1.86	130.00*
Flounder	1.10	48.30
Minor Coarse Sp. (MCS)	0.76	0
Trout	0	0
Total	11.86	596.00



Population composition.

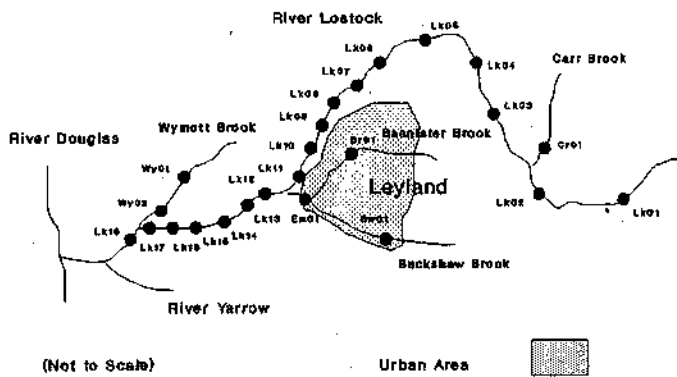


Biomass composition.

Lk16 NGR. SD 512 199

Pre-stocking Survey

The River Lostock System.



Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	2.0	9.83
Dace	0	0
Rosch	0	0
Perch	0	0
Pike	0	0
Gudgeon	0.66	10.83
Bream	0	0
Tench	0	0
Carp	0	0
Eel	5.80	200.00*
Flounder	0.60	0
Minor Coarse Sp. (MCS)	10.80	110.00
Trout	0	0
Total	19.78	330.66

