

River Tawd Post Stocking Survey 1998



Scientific Investigations Database - NFFT

Unique Document No: **5185**

UDC Class No: **639.2.03**

Keywords: **POST STOCKING,
MONITORING**

Annotations:

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River Tawd Post Stocking Survey 1998

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Acknowledgements

I wish to thank Paul Glover for his help in the planning and execution of the fisheries surveys together with Heather Airlie and James Hancock. I should also wish to thank Dawn Grundy for her help in the identification of suitable survey sites.

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1.0 Executive Summary.

- The purpose of this study was to determine the success of re-stocking the River Tawd and monitoring their migration and survival rates due to improved water quality throughout the river.
- Pre-stocking surveys were carried out in 1995 as part of the 1995 report on the stock assessment of the River Douglas catchment (EA report reference: EA/NW/FTR/96/2) at two sites and resulted in no fish being caught. The surveys were carried out at Cobbs Clough Lane (Skelmersdale) and Deans Lane (Hoscar).
- 3000 each of Roach, Chub and Dace were stocked at Summer Street, Skelmersdale in November 1997.
- After stocking, five sites were surveyed by electric-fishing in October 1998. Only one site out of five surveyed was found to have been successfully stocked with 82 roach, one chub and no dace being caught. This site was at Summer Street (TAWD04).
- The site at Deans Lane (TAWD01) contained 19 Eels, 3 Flounder and Stone Loach.
- The site at Tawd Vale Scout Camp (TAWD02) contained 2 Stone Loach and a single Eel.
- The site at Cobbs Clough Lane (TAWD03) contained 3 Sticklebacks.
- The site at Skelmersdale town centre (TAWD05) contained no fish.
- Further stocking is to be carried out in November 1998, 1999 and 2000 as part of the Agency's coarse fish stocking plan (from Leyland Fish Farm). Provisional stocking numbers are 3000 each of roach, chub and dace.
- It is recommended that the stocking is continued in subsequent years at Summer Street and also downstream at Cobbs Clough Lane. Other sites maybe suitable and will be investigated
- It is also recommended that all the sites are resurveyed in the autumn of 2000 to reassess the successfulness of these stockings. The survey sites should be amended to include new sites which contain good fisheries habitat near to the stocking sites and any additional stocking sites.

2.0 Aim.

The aim of this study was to determine whether the water quality of the River Tawd had improved sufficiently to allow a mixed coarse fish population to establish itself on the river after the stocking of juvenile Roach (*Rutilus rutilus*), Dace (*Leuciscus leuciscus*) and Chub (*Leuciscus cephalus*) in 1997. This report will consider the survival of the stocked fish.

If the stocking was successful, other potential stocking sites will be recommended for future stocking with a view to developing the River Tawd fishery.

3.0 Introduction.

3.1 The Tawd Catchment.

The River Tawd is a tributary of the River Douglas catchment. The Tawd is approximately 8km in length from its source, to the south of Skelmersdale, to its confluence with the River Douglas at Snipe Hall farm (NGR 476 126).

As the Tawd meanders its way from the elevated landscape, it passes through the heart of Skelmersdale. After passing through Skelmersdale, the river continues down through a variety of farm pastures, particularly arable and pastoral areas until it merges with the River Douglas. The Tawd receives effluents from a mixture of urban, industrial and agricultural sources of pollution.

3.2 The Fisheries of the River Tawd.

Historically, the River Tawd has held both coarse and migratory salmonid fish populations. These populations have declined as a result of pollution levels in the catchment from urban, industrial and agricultural sources, especially during the industrial revolution. The most recent comprehensive stocking survey of the River Douglas catchment in 1995 surveyed the River Tawd at two sites, one downstream of Skelmersdale on Cobbs Clough Lane (NGR 477 083) and the other approximately 1.25km upstream of the confluence with the Douglas on Deans Lane, Hoscar (NGR 474 116). This survey showed no fish populations and subsequently, both sites were classed as National Fisheries Classification Scheme (NFCS) F (see appendix 1 for NFCS classification).

The water quality of the River Tawd has improved in recent years. Work by Agency Departments has led to the water quality increasing from generally class 3 to class 2 (see appendix 2 for general water quality criteria). At the commencement of this study, the class 2 water quality was believed to be of good enough quality to allow the re-establishment of a mixed coarse fishery in the river through re-stocking.

In 1995, it was believed that the improvement in water quality and lack of fish populations may simply be due to little influx of fish from the main river and due to inaccessibility of some reaches of the river due to impassable weirs (upstream of Cobbs

Clough Lane). It was decided that the middle reaches of the river were to be stocked with Roach, Chub and Dace upstream of these restrictions from Leyland Fish Farm in November 1997 and that the survival of these populations be monitored.

4.0 Methodology.

4.1 Stocking Strategy.

Following a habitat survey of the River Tawd, a site was identified for the stocking of fish based upon its diverse habitat and accessibility. The site is situated at Summer Street, in Tawd Valley Country Park, Skelmersdale (Figure 1). The river in this area has a meandering characteristic with a variety of deep pools and shallow glides. The bankside vegetation is mainly large deciduous trees with low-lying shrubs and Himalayan Balsam. The river itself has a variety of prime 'holding areas' for fish, particularly around old sunken trees and exposed root systems. Given this diverse habitat, it was decided that 3000 each of juvenile roach, chub and dace would be stocked and their survival monitored.

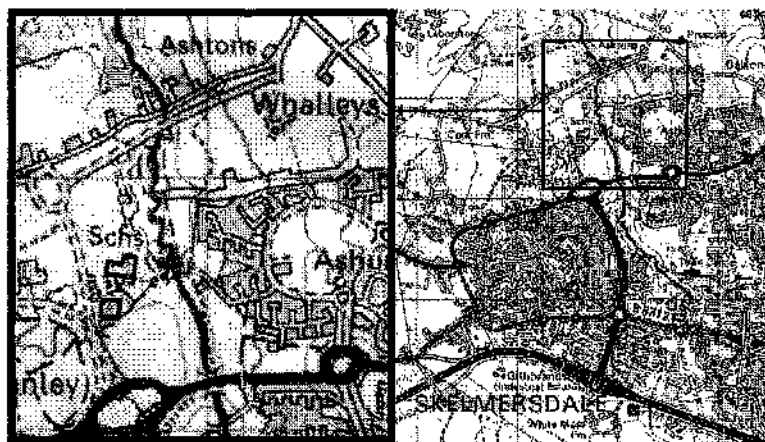


Figure 1. The location of Summer street, Skelmersdale (indicated by *).

4.2 Electric Fishing Sites.

Following the improvements in water quality and subsequent stocking of fish at Summer Street, four other sites were surveyed to assess the movement of fish around the Tawd catchment. The positions of the sample sites and their grid reference are given in Table 1.

Table 1. Position and Grid Reference of Electric Fishing Sites		
Site Reference	Sample Site Location	National Grid Reference (NGR).
TAWD01	Deans Lane	SD 474 116
TAWD02	Tawd Vale Scout Camp	SD 470 100
TAWD03	Cobbs Clough Lane	SD 477 083
TAWD04	Summer Street	SD 478 078
TAWD05	Town Centre Car Park	SD 485 063

The site around Deans Lane (TAWD01) is on the lower reaches of the Tawd and this site was chosen as it is approximately 1.25km above the confluence with the Douglas, hence, any migrating fish from the stocking site or influx of fish from the main river could be observed. Further upstream, at Tawd Vale Scout Camp (TAWD02) is an area of prime salmonid habitat and is within two kilometres of the stocking site. This site was surveyed to assess any salmonids in the area as well as assess any movements of the stocked fish. Cobbs Clough Lane (TAWD03) is less than a kilometre from where the fish were introduced and provides ideal habitat for species such as Roach, Chub and Dace. This site, together with Summer Street above, was expected to yield most fish. Upstream of Cobbs Clough Lane was Summer Street (TAWD04). This is the site where the 3000 each of Roach, Chub and Dace were introduced and provides ideal habitat. The upper-most site (TAWD05), approximately 1.5km upstream of Summer Street, was surveyed in the town centre of Skelmersdale to assess any upstream migration of the stocked fish. This area sustains good habitat but had a more salmonid bias rather than cyprinid with its shallower, faster flowing water.

4.3 Pre-stocking Electric Fishing Surveys.

Electric fishing surveys were conducted prior to the stocking at two sites on the River Tawd as part of the Douglas catchment stock assessment of 1995. One of the sites was Cobbs Clough Lane (TAWD03), immediately downstream of the stocking site and the other was at Deans Lane (TAWD01). The sites were surveyed for 50m using electric fishing equipment, with pulsed DC using two electrodes. Sites were studied by upstream wading (single pass) to an obstruction as no stop-nets were available.

4.4 Stock Assessment Survey of the Tawd Catchment, October 1998.

Electric fishing surveys were carried out in October 1998 to evaluate the success of the re-stocking and to assess the survival rates of the stocked fish. Each of the sites were surveyed for 50m using electric fishing equipment, with pulsed DC using two electrodes. Sites were studied by upstream wading (single pass) to an obstruction as no stop-nets were available.

5.0 Results.

5.1 Pre-stocking Survey.

The results of the pre-stocking electric fishing surveys are given in Table 2.

Sample site	National Grid Reference (NGR).	Average Width	Site Length	Area Surveyed (m ²)	Density (N/100m ²)	NFCS
Deans Lane	SD 474 116	4.5	50	225	0	F
Cobbs Clough Lane	SD 477 083	5	50	250	0	F

5.2 Post-stocking Survey.

The results of the post-stocking electric fishing surveys are given in Table 3 (site survey information is given in appendix 3).

Site	NGR (6 fig)	Species & number	Ave Width (m)	Site Length (m)	Area Surveyed (m ²)	Density (N/100m ²)	Biomass (g/100m ²)	NFCS - Absolute	NFCS - Relative
Deans Lane TAWD01	SD 474 116	19 Eel 3 Flounder 50+ Stone loach	4.5	50	225	8.4 1.3 22.2+	230.2 119.1 -	Salmonid: F Coarse: E	Salmonid: E Coarse: D
Tawd Vale South Camp TAWD02	SD 470 100	2 Stone Loach 1 Eel seen	3.0	50	150	1.3 0.67	-	Salmonid: F Coarse: F	Salmonid: E Coarse: E
Cobbs Clough TAWD03	SD 477 083	3 stickle-back	5.0	50	250	7.5	-	Salmonid: F Coarse: F	Salmonid: E Coarse: E
Summer St TAWD04	SD 478 078	82 Roach 1 Chub	5.0	50	250	32.8 0.4	695.2 80	Salmonid: F Coarse: D	Salmonid: E Coarse: B
Skelmersdale Town Centre Car Park TAWD05	SD 485 063	Nothing Caught	4.0	50	200	-	-	Salmonid: F Coarse: F	Salmonid: E Coarse: E

6.0 Discussion.

6.1 Pre-stocking survey.

As the results from Table 2 show, there were no fish found in the survey sites before stocking commenced. However, the habitat contained vegetative cover for the fish and a rich benthic community supporting a rich supply of invertebrate life, all essential for the successful fishery. Providing the water quality was maintained at class 2, the combination of a rich food supply and good water quality should provide good habitat for the stocked fish.

6.2 Post-stocking Survey.

The post-stocking survey results were very poor, with only Summer Street showing successful colonisation of coarse fish species from the stocking programme. Further downstream at Cobbs Clough lane, the results were very poor with only three sticklebacks caught and none of the introduced fish. This suggests that the fish have not migrated downstream of the original stocking site. The subsequent recapture of fish at the stocking site also suggest poor retention of the stocked fish. Of the 3000 Roach stocked in 1997, 82 were re-captured, only a 2.7% survival rate. However, there is a considerable distance between the two sampling sites, approximately 0.75km, most of which is rich in habitat for the fish. If this is considered, it is possible that as

much as 41% of the stock is present, but without further electric fishing surveys downstream of Summer Street, the exact retention of Roach will not be known.

The post-stocking survey at Summer Street included the capture of a single chub of 180mm (200g). However, it is unlikely that this fish was one of the introduced chub as its size is far in excess of that which would be expected after one years growth from the original stocking size. As none of the introduced chub were recaptured, it is likely that most of the fish have died or have migrated further up-stream or down-stream, away from the survey site. Again, without more detailed survey work it is impossible to explain the actual reason why no chub were present in the surveyed sites.

Out of the sites surveyed, none of the introduced Dace were re-captured. Again, this is hard to explain as the habitat required by this species is in abundance around Summer street and further downstream.

Overall, it is likely that the water quality of the River Tawd has improved sufficiently to sustain a small population of Roach. It is not fully understood as to the reason why no Chub or Dace have been found. Possible explanations could be that the water quality has suited the Roach, but not the Chub and Dace, although this is unlikely. Other possibilities are that the flow rates of the site, being slower flowing due to the mostly pool nature, suited the Roach rather than the Chub and Dace which prefer slightly faster flowing and more oxygenated water and therefore migrated from the original stocking site. These sites were not covered in the survey. It is also possible that the Roach colonised the area rapidly and became more competitive than the Chub and Dace, therefore out-competing them resulting in their migration or extinction.

With ever improving water quality, it is recommended that the stocking programme continues. It is recommended that the stocking is segregated with fish introduced in smaller populations and spread throughout the river. If the 3000 each of Roach, Chub and Dace are split into 3 stocking sites with 1000 of each species stocked in each of the areas, this minimises initial intraspecies competition and overall interspecies competition as well as spreading the fish throughout the river. Recommended stocking sites are given in Table 4. These fish should be stocked in this fashion from November 1999 as these recommendations were not available for the stocking in 1998.

Table 4. Stocking Sites and Numbers 1999				
Location	Grid Reference	Species		
		Roach	Chub	Dace
Summer Street, Skelmersdale	SD 478 078	500	500	500
Cobbs Clough (Park Walkway Bridge)	SD 477 079	1000	1000	1000
Spencers Bridge, Lathom	SD 468 107	500	500	500
US Tawdside Farm, Deans Lane	SD 473 117	1000	1000	1000
Total		3000	3000	3000

These stocks should be monitored in the autumn of 2000 to assess their movements and mortality rate in a tighter area between Cobbs Clough Lane and Summer Street as well as the new stocking sites. The assessment sites proposed for the survey in autumn 2000 are given in Table 5.

Table 5. Ammended River Tawd Survey Sites Autumn 2000		
Site Code	Sample site	National Grid Reference (NGR).
TAWD01a	Deans Lane	SD 474 116
TAWD01b	US Tawdside Farm, Deans Lane	SD 473 117
TAWD01c	Spencers Bridge, Lathom	SD 468107
TAWD02	Tawd Vale South camp	SD 470 100
TAWD03a	Cobbs Clough Lane	SD 478 083
TAWD03B	Tawd Vale Country Park	SD 477 079
TAWD04	Summer Street	SD 478 078

Appendix 1.

National Fisheries Classification Scheme.

The National Fisheries Classification Scheme was developed in order to allow the fishery status of any surveyed 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 fishery (level 4). The most fundamental division in the hierarchy is between the numbers of salmonids and the biomass of coarse fish per 100m² 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 the database.

To use the NFCS, raw survey data included: the numbers of each year class of salmonids and the biomasses of coarse fish (classed into Limnophillic, Rheophillic, 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. From this data, a classification of each site was made.

The NFCS classifies sites 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 were 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.

Class descriptions for National Fisheries Classification Scheme.	
Class	Description
Absolute Classification	
A	Within the upper quintile of sites/reaches containing species/age groups
B	Within the second quintile of sites/reaches containing species/age groups
C	Within the third quintile of sites/reaches containing species/age groups
D	Within the fourth quintile of sites/reaches containing species/age groups
E	Within the lower quintile of sites/reaches containing species/age groups
F	species/age group absent
Relative Classification	
a	Within the upper quintile of sites/reaches containing species/age groups
b	Within the second quintile of sites/reaches containing species/age groups
c	Within the third quintile of sites/reaches containing species/age groups
d	Within the fourth quintile of sites/reaches containing species/age groups
e	Within the lower quintile of sites/reaches containing species/age groups

Appendix 2. River Ecosystem Classification – Water Quality Criteria.

Class	Dissolved Oxygen (% Sat)	BOD (ATU) mg/l 90%ile	Total Ammonia mg/l 90%ile	Unionised Ammonia mg/l 95%ile	pH lower unit 5%ile, Upper limit 95%ile	Hardness mg/l CaCO ₃ mean	Dissolved Copper mg/l 95%ile	Total Zinc 95%ile
RE 1	> 80	< 2.5	< 0.25	< 0.021	6.0 - 9.0	< = 10 > 10 & < = 50 > 50 & < = 100 >100	< 5 < 22 < 40 < 112	< 30 < 200 < 300 < 500
RE 2	> 70	< 4.0	< 0.60	< 0.021	6.0 - 9.0	< = 10 > 10 & < = 50 > 50 & < = 100 >100	< 5 < 22 < 40 < 112	< 30 < 200 < 300 < 500
RE 3	> 60	< 6.0	< 1.30	< 0.021	6.0 - 9.0	< = 10 > 10 & < = 50 > 50 & < = 100 >100	< 5 < 22 < 40 < 112	< 300 < 700 < 1000 < 2000
RE 4	> 50	< 8.0	< 2.50	-	6.0 - 9.0	< = 10 > 10 & < = 50 > 50 & < = 100 >100	< 5 < 22 < 40 < 112	< 300 < 700 < 1000 < 2000
RE 5	> 20	< 15.0	< 9.00	-	-	-	-	-

Appendix 3.

Site survey information.

River Tawd Survey Sites		
Site Code	Sample site	National Grid Reference (NGR).
Tawd01	Deans Lane	SD 474 116
Tawd02	Tawd Vale South camp	SD 470 100
Tawd03	Cobbs Clough Lane	SD 477 083
Tawd04	Summer Street	SD 478 078
Tawd05	Town Centre Car Park	SD 485 063

SITE REPORT

Site Details

Watercourse: River Tawd

Site Code: TAWD01

River System: River Douglas

Date Fished: 07-10-98

Location: Deans Lane, Hoscarr

N.G.R: SD 474 116

Habitat Features

Length (m): 50

Mean Width (m): 4.5

Area (m²): 225

Mean Depth (m): 0.2

Gradient (m/km): -

Maximum Depth (m): 0.3

Water Level: Low summer flows

Site Description (%):

Pool: 0

Riffle: 40

Glide: 60

Benthic make-up (%):

Silt: 30

Gravel: 60

Cobble: 10

Boulder: 0

Adjacent Land Use: Farmed grazing

Bankside Vegetation: Rough vegetation

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

Comments.

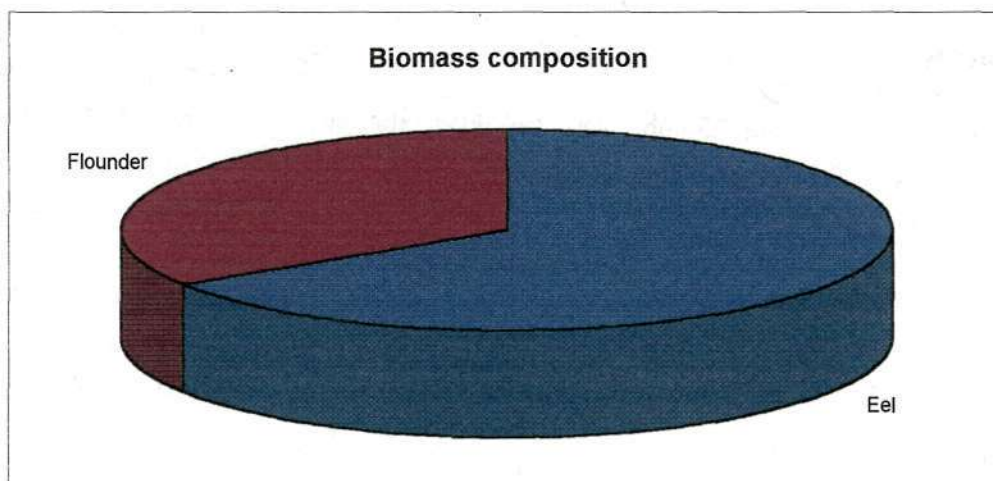
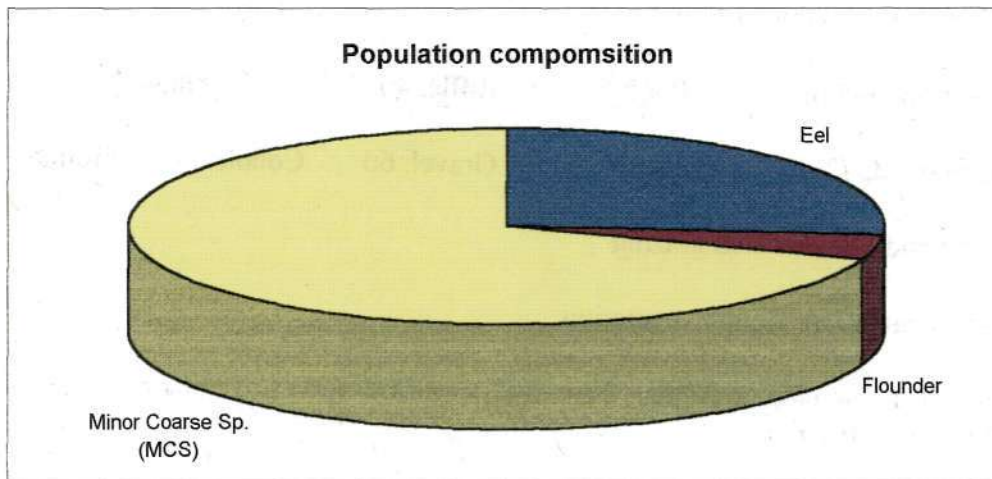
19 Eels between 95 and 250mm were caught at this site together with 3 flounder ranging between 80 and 220mm. Stone Loach were in abundance and large for this species.

Site 1. Dean Lane NGR: SD 474 116



* Dean Lane

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	8.4	230.2
Flounder	1.3	119.1
Minor Coarse Sp. (MCS)	22.2	0
Trout	0	0
Total	31.9	349.3



SITE REPORT

Site Details

Watercourse: River Tawd

Site Code: TAWD02

River System: River Douglas

Date Fished: 07-10-98

Location: Tawd Vale Scout Camp

N.G.R: SD 470 100

Habitat Features

Length (m): 50

Mean Width (m): 3.0

Area (m²): 150

Mean Depth (m): 0.4

Gradient (m/km): -

Maximum Depth (m): 0.5

Water Level: Low summer flows, coloured.

Site Description (%):

Pool: 0

Riffle: 100

Glide: 0

Benthic make-up (%):

Gravel: 0

Cobble: 10

Boulder: 80

Bedrock: 10

Adjacent Land Use: Woodland

Bankside Vegetation: Trees

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

Comments.

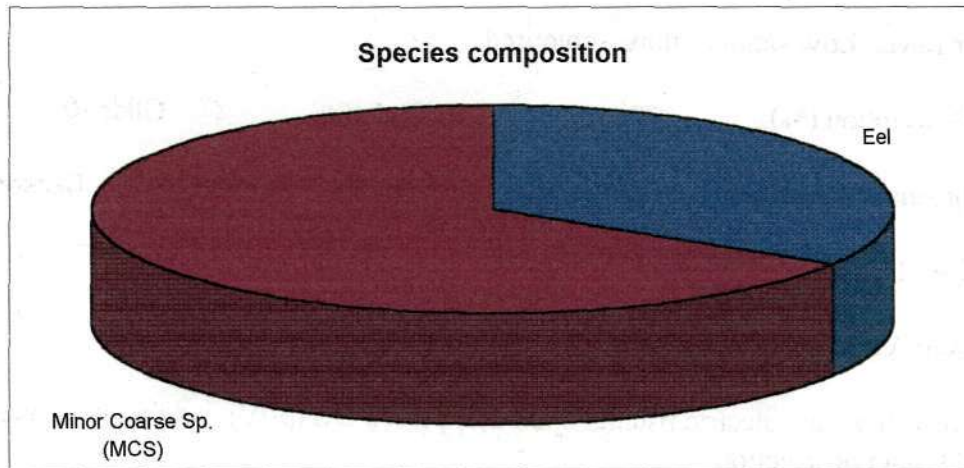
2 Stone-loach were caught at this site and 1 eel seen.

Site 2. Tawd Vale Scout Camp NGR: SD 470 100



* Tawd Vale Scout Camp

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	0.67	0
Flounder	0	0
Minor Coarse Sp. (MCS)	1.3	0
Trout	0	0
Total	1.97	0



SITE REPORT

Site Details

Watercourse: River Tawd

Site Code: TAWD03

River System: River Douglas

Date Fished: 07-10-98

Location: Cobbs Clough Lane, Skelmersdale N.G.R: SD 477 083

Habitat Features

Length (m): 50

Mean Width (m): 5.0

Area (m²): 250

Mean Depth (m): 0.6

Gradient (m/km): -

Maximum Depth (m): 1.1

Water Level: Low summer flows, turbid.

Site Description (%):

Pool: 0

Riffle: 0

Glide: 100

Benthic make-up (%):

Silt: 90

Gravel: 0

Cobble: 0

Boulder: 10

Adjacent Land Use: Woodland/grassland

Bankside Vegetation: Trees and grass

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

Fishery Classification (Level 3)

Comments.

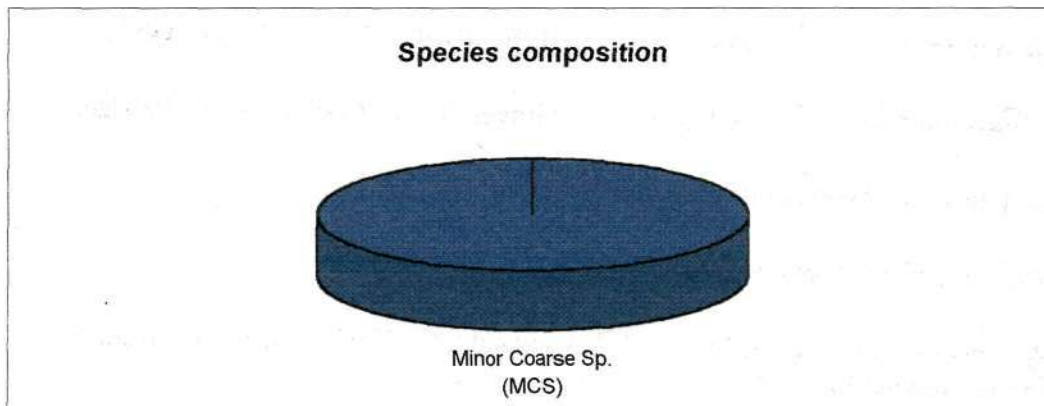
Only 3 sticklebacks were caught at this site.

Site 3. Cobbs Clough Lane NGR: SD 477 083



* Cobbs Clough Lane

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)	1.2	0
Trout	0	0
Total	1.2	0

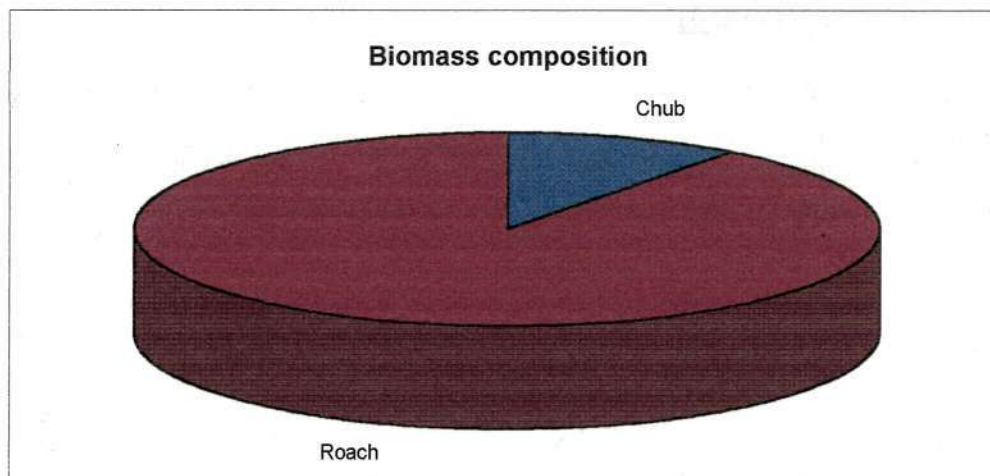
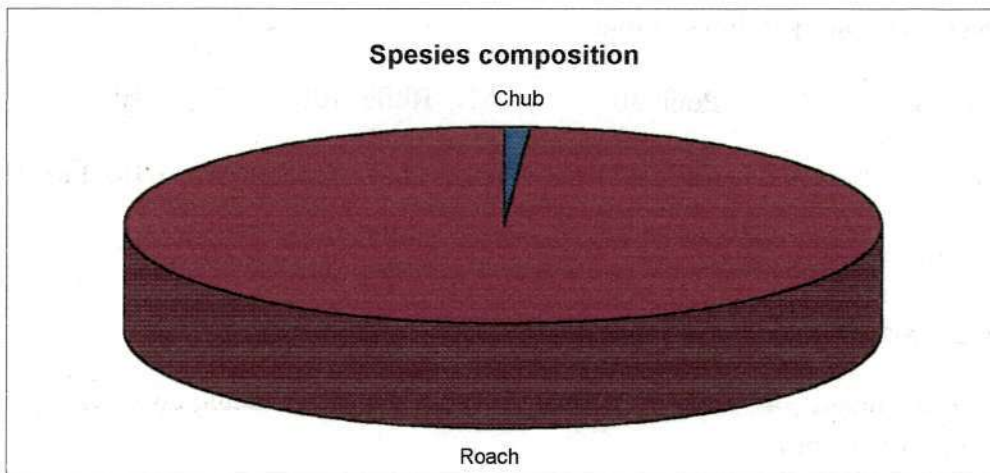


Site 4. Summer Street NGR: SD 478 078



* Summer Street

Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0.4	80.0
Dace	0	0
Roach	32.8	695.2
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	33.2	775.2



Site 5. Town Centre Car Park NGR: 485 063

Species	Density (N/100m ²)	Biomass (g/100m ²)
Chub	0	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



* Town Centre Car Park

Locations of electro-fishing sites within the catchment (denoted *)

