



THE *Tweed* FOUNDATION

A Tweed Foundation Paper

SECTION 3 : THE FISH SPECIES OF THE TWEED AND THE EYE

*Lampreys with
galantine*

Pyke in latmer sauce

*Salmon in foyle,
roasted*

Lampreys baked

Sturgeon in foyle with welkes

Carp in sharp sauce

Salmon baked

*Crevestes (Crayfish or marine
prawns)*

*Bream in sharp
sauce*

Carps in armine

Tenches flourished

Sir Herbert Maxwell, 1909 : *The Story of the Tweed*

When King William I of Scotland visited Norham Castle, during the Lent of the year 1200, two meals were provided which included these fish dishes (Maxwell,1909). Not all of the fish would have come from the wild: Carp, Bream and Tench are the typical species of stew ponds of mediaeval castles, manors and monasteries. The Sturgeon could have been an import but given its regular capture by nets in the Tweed estuary up to the early 20th century, it could have been local. Trout and Eels are not listed, which seems odd as they would certainly have been available. Gudgeon, Baggies (Minnows) and Beardies (Stone Loach) which now live in the Tweed are not mentioned either, though were eaten at that time. All the abbeys and other religious institutions in the catchment would have had their fish ponds, as would larger secular houses and castles. That fish ponds could have been quite common is shown by the fact that a mill at Lauder had fish ponds in the 12th Century (Thompson, 1902)

1 The Fish Species found in the Tweed and Eye systems: There are, at present, 20 fish species that can be found in the river Tweed and its tributaries and nine in the Eye and its burns which are listed below: Juvenile and adult stages and breeding environment are marked “F” for fresh water or “S” for salt water. Brackets have been put round the symbols if natural breeding in the rivers is unknown and a “?” given if it is uncertain: “T” denotes species recorded from the Tweed catchment and “E” those from the Eye catchment:

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Table 3.1.1 : Fish species found in the Tweed and Eye Fisheries District

| A : NATIVE, BREEDING | | Scientific name | Juveniles | Adults | Breeds | Records | |
|--|--------------------------------------|-------------------------------|------------------|---------------|---------------|----------------|-----|
| A.1 | Atlantic Salmon | <i>Salmo salar</i> | F / S | F / S | F | T | E |
| A.2a | Sea-trout | <i>Salmo trutta trutta</i> | F / S | F / S | F | T | E |
| A.2b | Brown-trout | <i>Salmo trutta fario</i> | F | F | F | T | E |
| A.3 | Arctic Charr ⁽¹⁾ | <i>Salvelinus alpinus</i> | F / S | F / S | F | T | |
| A.4 | Three-spined Stickleback | <i>Gasterosteus aculeatus</i> | F | F / S | F | T | E |
| <i>Taxonomically not "fish" but generally included with them :</i> | | | | | | | |
| A5 | Brook Lamprey | <i>Lampetra planeri</i> | F | F | F | T | E |
| A.6 | River Lamprey | <i>Lampetra fluviatilis</i> | F / S | F / S | F | T | E ? |
| A.7 | Sea Lamprey | <i>Petromyzon marinus</i> | F / S | F / S | F | T | E ? |
| B : NATIVE, not breeding in fresh water | | | | | | | |
| B.1 | Flounder | <i>Platichthys flesus</i> | F / S | F / S | S | T | E |
| B.1 | European Eel | <i>Anguilla anguilla</i> | F / S | F / S | S | T | E |
| C : ALIEN, BREEDING | | | | | | | |
| C.1 | Baggie / Minnow ⁽²⁾ | <i>Phoxinus phoxinus</i> | F | F | F | T | E |
| C.2 | Beardie / Stone Loach ⁽²⁾ | <i>Barbatulus barbatulus</i> | F | F | F | T | E |
| C.3 | Perch | <i>Perca fluviatilis</i> | F | F | F | T | |
| C.4 | Pike | <i>Esox lucius</i> | F | F | F | T | |
| C.5 | Grayling | <i>Thymallus thymallus</i> | F | F | F | T | |
| C.6 | Roach | <i>Rutilus rutilus</i> | F | F | F | T | |
| C.7 | Dace | <i>Leuciscus leuciscus</i> | F | F | F | T | |
| C.8 | Gudgeon | <i>Gobio gobio</i> | F | F | F | T | |
| C.9 | Bullhead | <i>Cottus gobio</i> | F | F | F | T | |
| D: ALIEN, NON-BREEDING | | | | | | | |
| D.1 | Rainbow Trout | <i>Oncorhynchus mykiss</i> | F | F | F ? | T | |
| E: Vagrants and Visitors, not breeding in the District | | | | | | | |
| E.1 | Allis Shad | <i>Alosa alosa</i> | F / S | F / S | (F) | T | |
| E.2 | Baltic Sturgeon | <i>Acipenser sturio</i> | F / S | F / S | F | T | |
| E.3 | Sparling / Smelt | <i>Osmerus eperlanus</i> | F / S | F / S | F | T | |

F : Possible Visitors

Twaite Shad : There are some records of this in nearby estuaries, but none from the Tweed estuary.

G : Escapes

Ornamental fish species such as Carp and Tench occasionally escape into the rivers

(1) Arctic Charr were originally present in St. Mary's Loch but became extinct. They have since been re-introduced to the catchment.
 (2) Could possibly have arrived by natural means and therefore be natives

The Dilution of the Native Fish Community of the Tweed : As is apparent from the number of non-native species now found in the Tweed, the original, native, fish species community has now had its original character diluted. Though individual populations such as the Salmon and Trout are of great conservation value in themselves, there is little now in the fish community as a unit. The presence of the non-native species means that the fishes of the Tweed no longer properly reflect the particular geographic location of the river on the planet, but have become an unnatural grouping of species significantly determined by human interference and accidents.

With so much emphasis given nowadays to the importance of biological "diversity" it may seem strange to say that the increased diversity of fish species now to be found in the Tweed represents a loss of biological value, but that is indeed the case. The point of real interest about the Tweed's -



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and Scotland's - original community of fish species was exactly its *lack* of diversity. Unlike the land animal community which was originally the same as continental Europe's due the land bridges across the English Channel at the end of the Ice Age, there was never a "freshwater bridge" between Scotland and the continent, so the only fish species that could reach this country were those that could make a crossing of salt or brackish water. This made Scotland's fish community very different from that of the South-east of England, which did have such a freshwater connection when the Thames was tributary of the Rhine and the southern North Sea was fresh water or marsh at the end of the Ice Age. The last land link was from the north of Norfolk across to the Frisian coast which was broken around 7,500 years before present (Wingfield *et al.* 1998). The fact that the northernmost limit of the native British White-clawed Crayfish (*Austropotamobius pallipes*) is the River Aln, immediately south of the Tweed catchment is probably a relict of this old landform.

The common characteristic of the native species is, therefore, that they can, either as adults or juveniles or both, live in salt or brackish water either under present climatic conditions or those prevailing in the past: Arctic Charr are migratory north of latitude 60° N today, and similar climatic conditions would have prevailed in this area as the Ice Age ended. The only native, purely, freshwater "species", the Brook Lamprey and the Brown-trout, are offshoots of the migratory River Lamprey and Sea-trout and are therefore derived from species with marine stages. It is just possible, however, that some of the purely freshwater fish species that now live in the Tweed could have arrived by natural processes - eggs stuck on to the feet of water birds is an often-quoted possibility - but since even the smallest and apparently most insignificant of these (Baggies and Beardies) have been found useful by humans in the past, there is also the possibility of artificial introduction. Some tributaries of the Tweed still only have the smaller non-native species, so when access for Salmonids is being eased, consideration is given to whether the changes being made might also allow non-native species to spread into new areas. Generally, if the obstacle is left as a "jump", non-salmonids will not be able to gain access. The problem of introductions of new species to the Tweed has been identified as a Key Issue for concern in the "Rivers and Burns" section of the Local Biodiversity Action Plan and the recent arrival of the Bullhead shows that the danger is ever present.

There have been two lists of the fish species of the Tweed drawn up in the past, by Johnston in 1838 and Bolam in 1919 which show the progressive dilution of the native fish community over time :

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Table 3.1.2 Lists of native and alien species in the Tweed & Eye Fisheries District

| <u>NATIVE</u> | Non-natives noted: | | |
|--------------------------|--------------------|---------------|------------|
| | JOHNSTON 1838 | BOLAM 1919 | Since 1919 |
| Salmon | Perch | Grayling | (Bullhead) |
| Sea & Brown Trout | Pike | Rainbow Trout | |
| Arctic Charr | Baggie | Roach | |
| Three-spined Stickleback | Beardie | Dace | |
| Eel | | Gudgeon | |
| Flounder | | | |
| (Allis Shad) | | | |
| Brook Lamprey | | | |
| River Lamprey | | | |
| Sea Lamprey | | | |

The process by which differences between plant and animal communities in different parts of the world are being eliminated by introductions has been called “*Ecological MacDonaldisation*”, seeing a parallel in the way in which the spread of “fast-food” chains is standardising tastes and habits in eating throughout the world to the way in which the increasing rate of introductions of animal and plant species are making biological communities the same and in particular, destroying the differences between islands and mainlands.

The Distribution of Fish Species in the Tweed and Eye Catchments: Knowledge of this is limited by the difficulty of sampling deep water. Shallow areas of small and medium sized channels are covered by the regular electric-fishing surveys of juvenile Trout and Salmon habitat but deeper areas are not and neither are the main channels. Plans are being made to cover such areas, but at present, comprehensive information is limited to electric-fishing sites, as shown in Table 3.1.3 :

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Table 3.1.3 : The fish species found in the medium and smaller channels of the Tweed and Eye catchments 1992-1998

| FISH SPECIES | TWEED | | EYE | |
|--------------------------|----------------|--------------|-----------------|--------------|
| | Sites found at | % Occurrence | Sites found at: | % Occurrence |
| Trout | 560 | 91% | 5 | 100 % |
| Eel | 302 | 49% | 5 | 100 % |
| juvenile Salmon | 234 | 38% | 0 | 0 % |
| Beardie (Stone Loach) | 153 | 25% | 4 | 80% |
| Baggie (Minnow) | 98 | 16% | 4 | 80% |
| Three-spined Stickleback | 86 | 14% | 3 | 60% |
| Lamprey larvae | 42 | 7% | 3 | 60% |
| juvenile Grayling | 5 | 0.8% | 0 | 60% |
| Gudgeon | 3 | 0.5% | 0 | 0% |
| Flounder | 0 | 0.0% | 1 | 20% |
| TOTAL SITES | 615 | | 5 | |
| <i>No fish species</i> | 25 | %4.1 | 0 | 0.00% |

In the areas covered by these surveys, juvenile trout are by far the commonest fish, found at 90% of the sites sampled, with Eels coming a poor second, at 48%. Of the 583 Tweed sites, 460 were in smaller burns, which are generally not inhabited by Salmon, hence their score of only 38%: Of the 155 medium-sized channel sites sampled however, Salmon were present in 132 (85%)

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