SECTION 3: THE FISHES OF THE TWEED AND THE EYE

C.8: Gudgeon
Gobio gobio

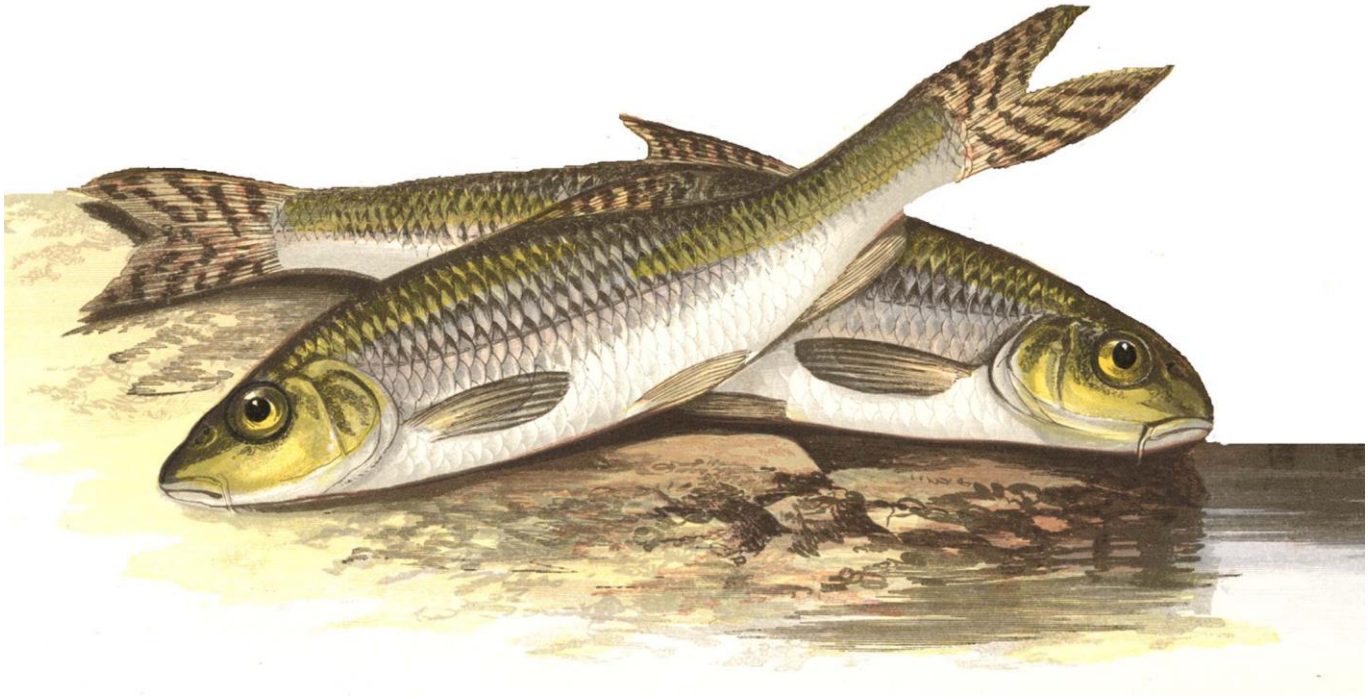

Photo C.8.1: The Gudgeon: Taken from British Freshwater Fishes by the Rev. W. Houghton, illustrated by A.F. Lydon, 1879

The Gudgeon is a small member of the Carp family, usually maturing in the British Isles at 15 to 20cms. Its most obvious characteristics are a single pair of long barbels hanging from the corners of the mouth and heavily spotted fins and tail. It is generally olive-brown in colour on the back and head, with some dark spotting along the sides which are of a lighter brown – they can look quite silvery, with a bluish tinge. The natural distribution of the Gudgeon is wide, stretching from western France across to China and the Pacific coast of Asia. It is presumed to have been native to the south of England, as other Carp species in the British Isles are, but has been widely spread by humans, generally as live bait for Pike fishing, or, in the past, for food.

Gudgeon are fish of running waters, preferring fairly fast stretches and good water quality. Breeding is in May and June when water temperatures are around 14ºC; the sticky eggs are spawned in shallow, flowing water amongst weeds and gravel. A female spawns several times, with different males, producing from 1,000 to 3,000 eggs in a season. The eggs hatch in 10 to 20 days, the larvae drifting into quieter areas along the water edges and the young grow from around 5mm at hatching to around 50mm by the end of their first summer. By their third year, they are around 120mm or so, and mature, the females being slightly larger than the males, most not reaching ages older than five years. The fry feed on small crustaceans (planktonic sized animals such as Copepods and Daphnia) in open water and among weed but as they grow, feed more on bottom living invertebrates such as worms, insect nymphs and larvae and molluscs and sometimes filamentous algae. Whilst not now eaten in the British Isles, they were in the past: Izaak Walton thought of them as very good eating (Walton 1676) and as late as 1879 a British writer could say that Gudgeon were as good as Smelt to eat and were, in his opinion, one of the best freshwater fishes for eating (Houghton, 1879). They are still eaten in parts of France.

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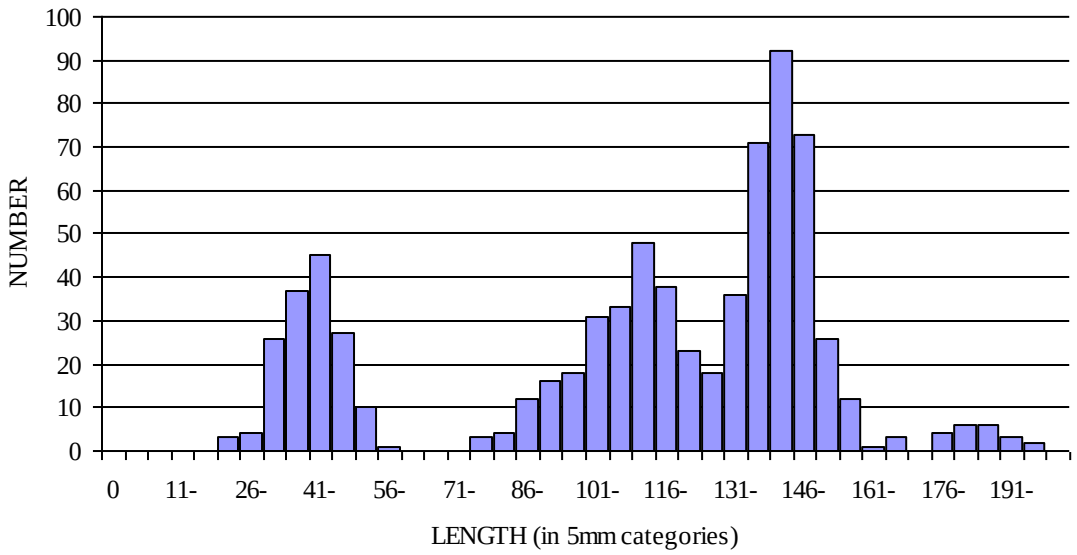
Gudgeon on Tweed: There appear to have been two separate introductions. one, unrecorded, to the Leet in the early 19th century and one to the Till towards the end of that century: "*In the Tweed area, as already stated, it is an undoubted alien, although it has long been plentiful in the Leet at Coldstream, and, as I was informed by a middle-aged person, in 1889, had been 'weel kenned there as lang as he could mind'* (Bolam, 1919). However, an Edinburgh based author, familiar with the Tweed in the early part of the 19th century, did not know of this species anywhere in Scotland (Wilson, 1844). It was also introduced into the Till catchment in the late 19th century: *"Its first appearance in the Tweed about Coldstream seems to date from about 1890, but its increase there is shown by the fact that during the netting operations for the destruction of coarse fish, undertaken by the Tweed Commissioners, 585 Gudgeon were killed between Coldstream and Twizel in 1913 and 445 during the following summer. Elsewhere in the watershed of the Tweed it is as yet unknown, except in the Till, where escapes from a pond at Milfield were known to be taking place for several years prior to 1889 and where it is now well established in some of the lower reaches."* (Bolam, 1919). The Gudgeon brought to this pond might have been brought deliberately for bait or for food or they could have come accidentally with the Roach that definitely were brought in for use as bait. That Gudgeon were used as bait for Salmon on the Tweed is shown by a fishing report in "The Scotsman" of the 6th December 1919 in which it is said "*One looks for big bags when the fisher may spin minnow or gudgeon, loaded with lead and bristling with barbs as he may do on Tweed ….*"

Sizes of Gudgeon on Tweed: A study of Gudgeon netted on the lower river, at Norham and the Union Bridge (Downie 1973), captured 732 fish ranging in size from 20 to 195mm. As shown in Graph C.8.1, the lengths fell into four groups, peaking at 40mm, 110mm, 140mm and 180mm. However, these peaks do not correspond directly with ages, as shown in Table C.8.1 which gives the average lengths calculated for fish whose age had been determined by scale reading. Whilst the first peak does represent one year old fish, the second is made up of 2 and 3 year olds, the third peak of 3 to 5 year olds and the fourth of the few fish reaching 6 and 7 years in age.



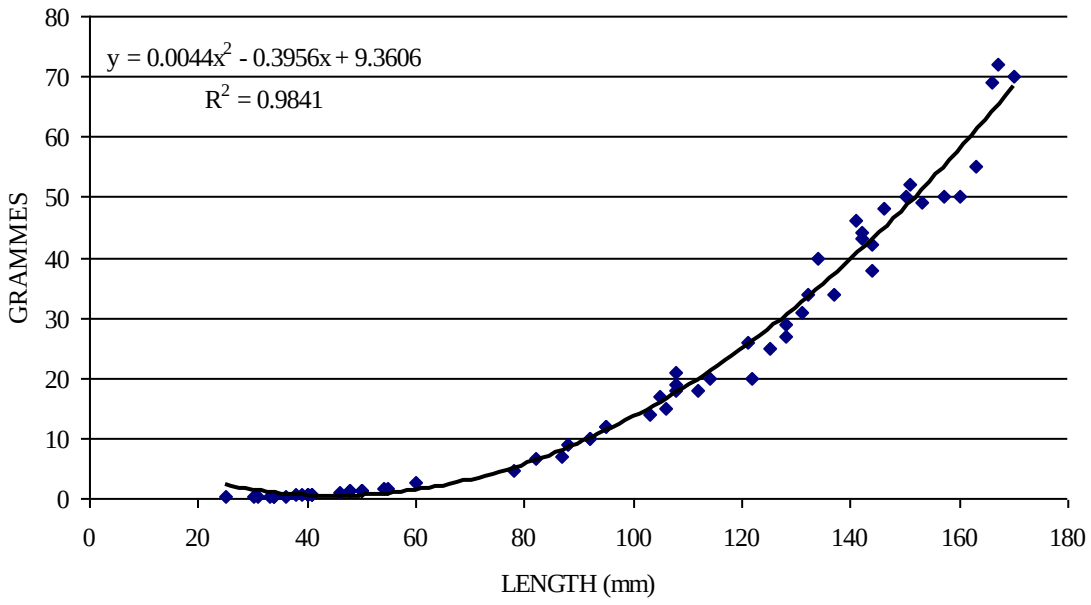
Graph C.8.1: Lengths of 732 Gudgeon netted at Tweedmill in May 1972 (n=345) and at Norham in January (n=137); March (n=133) and April (n=96) 1973

AGE	Av Length
1	41
2	101
3	131
4	149
5	157
*6	*170*
*7	*183*

*Lengths for Ages 6 & 7 are for individual fish, the fish aged as being 7 might have been 6

Table C.8.1: The average lengths of Gudgeon aged by scale reading

The length-weight relationship is shown in Graph C.8.2 from which it can be seen that few Gudgeon on Tweed are likely to reach 100gms in weight.



Graph C.8.2: The length-weight relationship of Gudgeon sampled on the Lower Tweed in Spring 1972 & 1973

The Food of Gudgeon on Tweed: The diet of a sample of Gudgeon netted at Tweedmill and Norham in 1972 and 73 is shown in Table C.8.2; of the 106 stomachs examined, 95 contained food. The main point of interest is the presence of zooplankton such as Daphnia, Cyclops and Cladocera in fish of 50mm or less in length: no larger fish contained them. These tiny Crustaceans are more animals of ponds than of rivers and their importance in the diet of Gudgeon fry shows that these small fish must feed in some very quiet areas of the river. Larger fish have a more normal riverine diet of insect nymphs and larvae, molluscs and shrimps, along with algae and plant material as well. Of all the different categories of prey eaten Chironomid (Midge) larvae are the most common, being the most frequent item eaten by all ages of Gudgeon other than Fry (0+).

% OCCURRENCE OF FOOD TAXA BY AGE			**0+**	**I+**	**II+**	**III+**	**IV+**	
Food Species			*51*	*19*	*14*	*5*	*6*	*95 total*
ANNELIDA		Leeches			7.14			1.05
MOLLUSCA	Freshwater cockles	*Sphaerium* spp	9.80	36.84	50.00	60.00	50.00	26.32
	Snails	*Valvata piscinalis*			7.14			1.05
INSECTA	Beetle larvae	*Limnius* sp larvae	1.96		14.29		16.66	8.42
		Elmis sp larvae		26.32				5.26
	Mayfly nymphs	*Baetis*	1.96	47.37	7.14		66.66	18.95
		Ecdyonurus		10.53		20.00	33.33	5.26
	Caddis larvae	*Hydropsyche* l		15.79	7.14		50.00	7.37
		Rhyacophila					16.66	2.12
	Blackfly larvae	*Simulium* spp	3.92	15.79	57.14	20.00	66.66	18.95
		Ceratopogonidae		10.53	35.71	20.00	33.33	10.53
	Midge larvae	Chironomidae L	27.45	78.95	100.00	100.00	100.00	56.84
	Midge pupae	Chironomidae Pup			42.86		33.33	8.42
		Dicranota sp				20.00		1.05
		Palpomia sp			7.14			1.05
CRUSTACEA	Freshwater shrimp	*Gammarus pulex*		10.53	14.29		66.66	8.42
	Water Hoglouse	*Asellus aquaticus*					16.66	2.12
	Zooplankton	Cladocera	37.25					20.00
	Zooplankton	Cyclops	3.92					2.11
	Zooplankton	Daphnia	23.53					12.63
		Ostracoda		26.32	28.57		16.66	10.53
PLANT MATERIAL		Filamentous algae	21.57	31.58	14.29	20.00	16.66	24.21
		Unidentified	29.41	63.16	50.00	80.00	33.33	40.00

Table C.8.2: The frequency of occurrence of prey types in the stomachs of 95 Gudgeon sampled from Tweedmill and Norham, October to April, 1972-73

Gudgeon on Tweed as Prey: Gudgeon are taken by fish-eating birds on the Tweed. A 1972-73 study of the stomach contents of 26 Cormorants shot on the lower Tweed found 2 Gudgeon amongst the 137 individual fish of all sizes that had been eaten (MacIntosh, 1978).

Photo C.8.2: On the 6th March 1973, approximately 1,000 Gudgeon were taken in one haul of a net at Norham (Photo: E. Hastings)