

THE INFLUENCE OF THE SHRIMP FISHERY
(CRANGON VULGARIS) ON THE STOCK

by

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It is an old question whether the fishery on shrimp, and particularly the catching of large quantities of immature shrimp have an important influence on the stock.

There are different opinions on this question. Gilis (1952) mentions a considerable decrease of the landings along the Belgian coast, compared with the pre-war catches, also the catch per unit effort decreased considerably. Assuming that the decrease of the stock is caused by too intensive fishing, Gilis recommends the use of nets with larger meshes in order to save the majority of the immature individuals.

Tiewis (1954) on the other hand ascribes the annual fluctuations which are conspicuous in the German Waddensea to variations in natural conditions.

In the Netherlands shrimp fishing is carried out along the whole North Sea coast, in the estuaries, and in the Waddensea (Fig. 1). In table 1 the landings in various districts are shown for a long series of years.

In the estuaries of the Scheldt the landing of immature shrimp commenced about 1928. For statistical purposes it is necessary to consider the sum of the catches of edible and industrial shrimp, because when the market situation is unfavourable edible shrimp must be used for industrial purposes.

The landings before the war were much larger than afterwards. During 1929-1939 the mean annual catch was 6500 tons, from 1946-1955 it was 2700 tons. It is impossible to ascertain exactly the ratio of fishing intensities in both periods, but it is rather sure that this intensity has not been reduced to less than 1/2 of the pre-war value. It is, therefore, rather certain that the stock has decreased during the war, just as Gilis could demonstrate by a decrease in catch per unit effort along the adjacent Belgian coast.

For the estuary of the Rhine we find quite the same course of the figures.

Catches per unit effort are available for the period since 1946. The graph for the estuary of the Scheldt (ARM in fig. 2) shows a tendency to decline. In the first 5 years the daily catch per vessel was 350 kg, in 1951-1955 it was 316 kg. In the estuary of the Rhine (graph SL) the catches per day per vessel stay at the same level, but in this case the vessels used for the statistics increased their engine power with 50%. This increase did not cause an increase of the catch.

Other landing ports along the coast (fig. 3, YM and TX) show a very distinct decline of the daily catch.

It is evident, therefore, that catches per unit effort have decreased since the war along the whole Dutch North Sea coast. This can only be explained by assuming that the stock has decreased.

We have seen that in the estuaries of the Scheldt and Rhine the quantities caught in the post-war years were much inferior to those that could be harvested in the pre-war years without affecting the stock. Assuming that natural conditions have not changed, such an exploitation would mean a considerable underfishing. And if the fishery had a substantial influence on the stock, this underfishing would induce an increase of the stock and of the catch per unit effort.

As, however, the stock has not increased in a 10 years period of underfishing, but on the contrary has decreased, I think we may draw 2 conclusions:

- 1°. the decrease of the stock since 1946 along the Dutch North Sea coast cannot have been caused by overfishing, for the exploitation had the character of a pronounced underfishing,
- 2°. the fishery, as carried out since 1946, has no predominant influence on the stock.

This would also explain why the catches per unit effort in 1946, after a reduced fishery during the war, were low.

The cause of the decrease of the stock must, therefore, be sought in other factors, not related to fishery. They could be changes in hydrographical conditions or increase of number of predators.

Now that we are obliged to accept a change of natural conditions this involves that in the present conditions the fishing intensity need not necessarily be qualified as underfishing, and it is even possible that our conclusion under 2° in the present situation is not right.

In 1955 there is a sudden rise of the landings and of the catches per unit effort in the estuaries of the Scheldt. This, however, cannot be considered as an indication that the stock is recovering, thanks to a 10 years period of underfishing. If this had been the cause the recovery should have been gradual. In reality the landings and catches per unit effort were low in 1954 and in the first months of 1955, but in the second half of the year they increased suddenly, apparently because one single well developed generation entered the fishery.

In contrast to the decreasing catches along the North Sea coast the Waddensea landings (table 1) and the catches per day per vessel (fig. 4) are increasing. It is true that the fishing intensity has increased, and also the fishing capacity per vessel, but this increase is accompanied by a substantial increase of the catches. Apparently the stock is not too much affected by the fishery in this area, and further there is no indication that natural conditions have changed unfavourably.

REFERENCES:

Gilis, C., 1952

LA PECHE CREVETTIERE SUR LA
COTE BELGE:
SON EVOLUTION AU COURS DES
ANNEES 1935-1951 ET SON IN-
FLUENCE SUR LE STOCK DE LA
CREVETTE.

Institut d'Etudes maritimes,
Ostende, Memoire no. 8.

Tiewws, K., 1954

Einfluss der Gezeiten und der
Wassertemperatur auf die Gar-
nelenfischerei.

Ber. Dtsch. Wiss. Komm. Meeresforsch.
XIII, 3.

TABLE 1

Landings of Shrimps, in various districts in the Netherlands, since 1916, in tons, used for human consumption (Cons.), for industrial purposes (Ind.) and the sum of both (C + I), in the estuaries of the Scheldt and of the Rhine and in the eastern and western part of the Dutch Waddensea.

Year	EST. SCHELDT			EST. RHINE			WADDENSEA W.			WADDENSEA E.		
	Cons.	Ind.	C+I	Cons.	Ind.	C+I	Cons.	Ind.	C+I	Cons.	Ind.	C+I
1916-1920	2354			850	86	936	3035					
1921-1925	2029			997	54	1051	2246					
1926-1930	2041	1988 ¹⁾	4029	845	328	1173	2550					
1931-1935	2084	3117	5201	840	564	1404	1019 ²⁾					
1935	1447	3130	4577	766	834	1600	573			65	4965	5030
1936	1817	8128	9945	758	1556	2314	410			56	10092	10148
1937	1575	6776	8351	838	1559	2397	202			77	11051	11128
1938	1643	3256	4899	1012	1104	2116	299			87	8241	8328
1939	1303	7099	8402	1045	1049	2094	353			111	11272	11383
1946	1097	12	1109	451	49	500	573	206	779	406	2029	2435
1947	1951	854	2805	949	196	1145	678	701	1379	476	5306	5782
1948	1400	180	1580	1045	104	1149	645	289	934	675	2765	3440
1949	1163	1685	2848	524	310	834	604	280	884	682	2602	3284
1950	1188	1367	2555	542	327	869	583	863	1446	675	4712	5387
1951	1394	1818	3212	525	319	844	976	1539	2515	1078	4992	6070
1952	1532	1946	3478	458	292	750	1332	2881	4213	519	4071	4590
1953	1297	1775	3072	285	235	520	1355	3478	4833	748	6836	7584
1954	901	1075	1976	275	268	563	1635	3122	4757	974	5662	6636
1955	1938	3205	5143	318	219	537	2341	4365	6706	1227	5306	6533

1) For the years 1929 and 1930. 2) These figures include the landings from the Zuider-sea up to 1931.

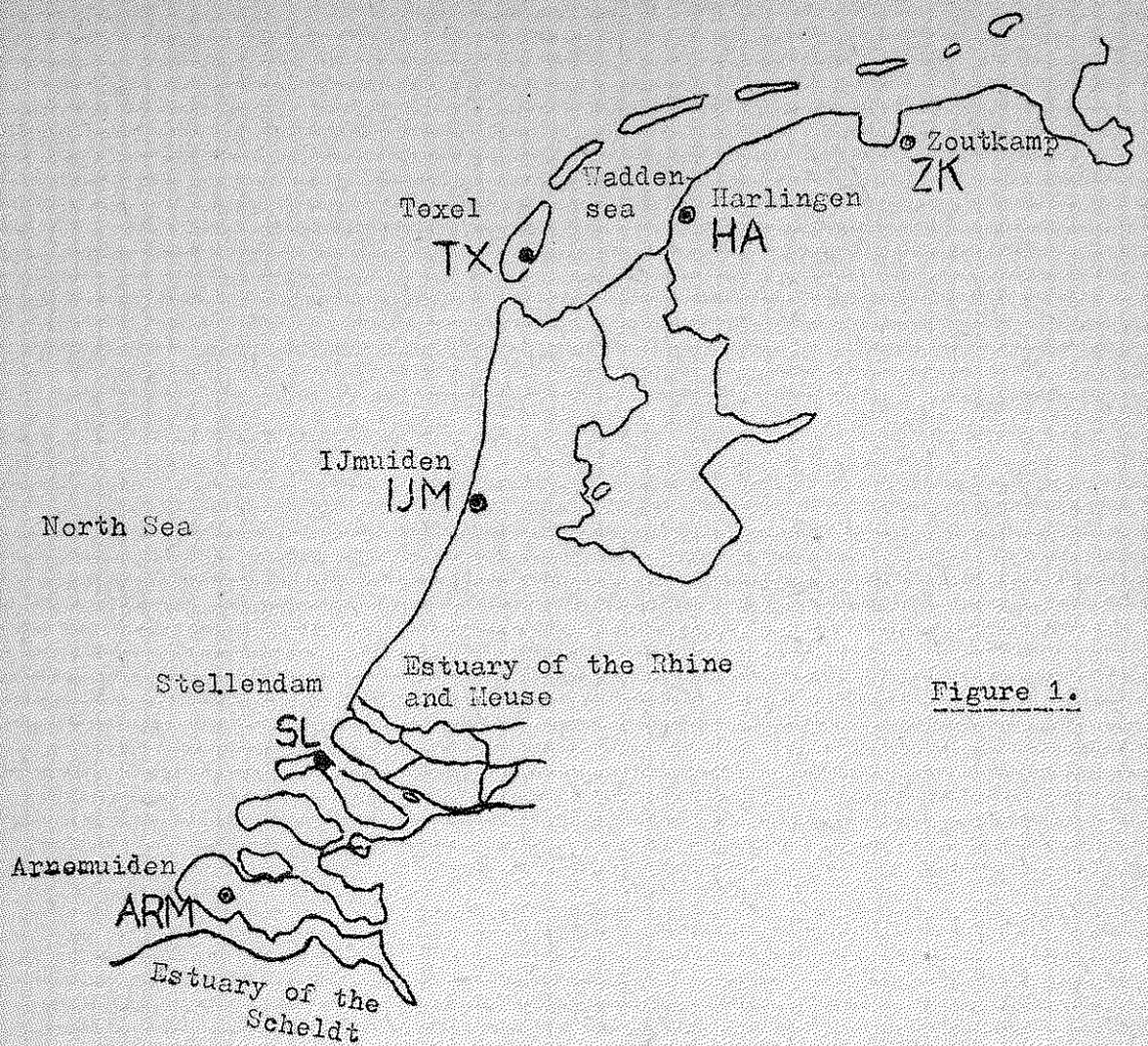


Figure 1.

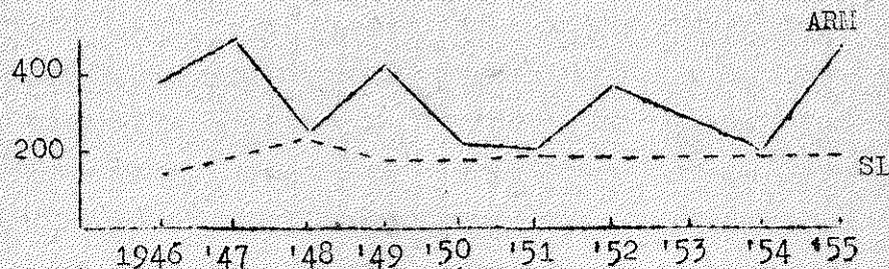


Fig. 2

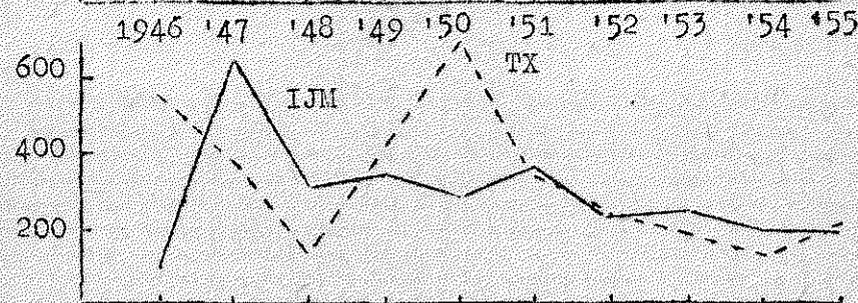


Fig. 3

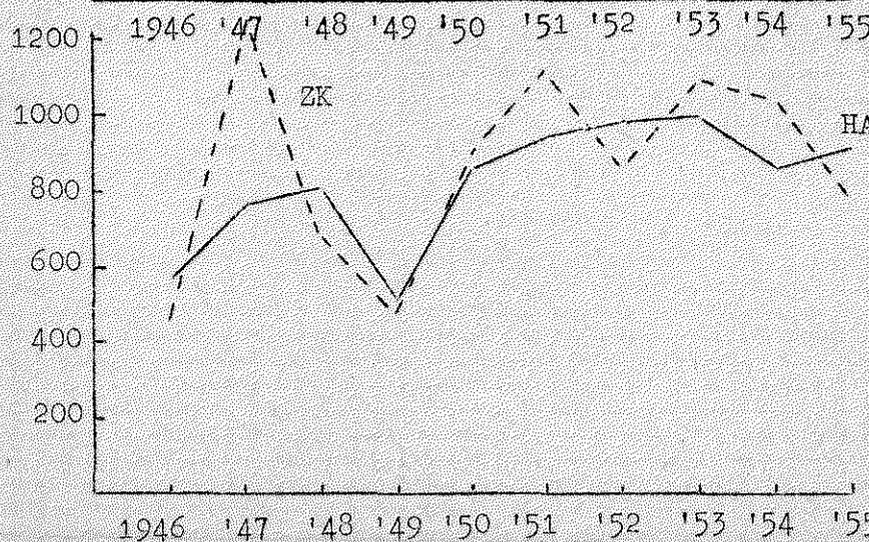


Fig. 4

Fig. 2, 3, 4. Shrimp catches per day per vessel in various districts. Edible and immature shrimp added.