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Results of tagging experiments with eel released
into the Vistula River and Gulf of Gdańsk

by

R. Bartel and M. Kosior

Inland Fisheries Institute, and Sea Fishery Institute, Poland

Summary

In order to trace the migrations, 9,276 tagged eel 24 cm to 63 cm long were released into the Lower Vistula and the Gulf of Gdańsk from 1970 till 1972. The percentage of recaptures ranged from 3.1% to 13.6%. Most of them have been caught near the places of release during two-three months. However, some fish could be found in Western Baltic areas, and as regards the time - in seventeen months. When fish had been tagged and released in the Vistula River, a tendency to move down the river was observed.

Introduction

An increased interest in eel, which concerns some problems of stocking and its commercial results, as well as farming, can be seen in recent years. Simultaneously investigations on eel biology are being carried out.

Catch distributions in some areas and periods of time are the main sources of information on the migrations of older eel.

Not numerous data from tagging eel are available on the other hand, because of great methodological difficulties which are well known.

The tagging experiments whose results are presented in this report have been taken up in order to trace eel migrations in the lower part of the Vistula River, and in the Gulf of Gdańsk, as well as, to answer the question whether eel less than 60 cm long migrate beyond the Gulf of Gdańsk.

Material and method

A total of 9,276 eel was tagged from 1970 till 1972, using 15 mm x 5 mm red plastic plates attached by means of a monel metal wire under the dorsal fin. Urethane or MS-222 was applied for anaesthetizing the fish during a tagging procedure.

The length of tagged fish ranged from 24 to 63 cm, and particular samples consisted of specimens having in 2.2 to 15.6 per cent silvery skin and enlarged eyes.

As shown in Figure 1, fish were released into the four places of the Lower Vistula - near Opalenie, Tczew, Palczewo, and Kieźmark, into the Vistula River mouth, and into the Gulf of Gdańsk - from 2 to 8 naut. miles off shore. Then, recaptures came mainly from some fyke nets.

Results

A total of 864 specimens was recaptured that is 9.3 per cent of released fish. However, taking into account separate experiments the recoveries were from 3.1 to 13.6 per cent /Table 1/.

The highest percentage of returned tags has been obtained in the case of eel released into the Vistula River near Tczew /13.6% - experiment 1 in Table 1/. The most of recaptures were caught near the place of fish release in this experiment /67% - experiment 1 in Table 1, and Figure 2/. After fish had been released somewhat upper or lower in the river in the

experiments 2, 3, 4, and 5 the numbers of recaptures decreased relatively amounting to 5.6% till 10.2% /Figure 1, and Table 1/. But distribution of them in relation to the release place was, like the one observed previously in the experiment 1: from 70.6% to 89.7% of recaptures have been caught in vicinity of the release place, no farther than 6 km to 40 km off /Table 1; Figure 3, 4, and 5/. Moreover, it seems also interesting that all the fish tended rather to move down the river after tagging in these five experiments. Some of them entered the sea being then caught eastward of the Vistula mouth, and less frequently westward of the mouth, in the Gulf of Puck, near the Hel Peninsula.

As regards the period of time, the recaptures were mainly caught during the first two months after tagging when 55.2% to 65.5% of them were obtained in those five experiments.

Finally, in the experiments with eel released into the Vistula mouth and Gulf of Gdańsk most of fish were recovered in their original areas, too, that is in the river mouth as well as in the east and west inshore grounds of the Gulf of Gdańsk. Not numerous specimens were found in the Gulf of Puck, near the Hel Peninsula, and in the Vistula Firth. On the other hand, several fish moved up the Vistula River in this case /Figure 6/. Moreover, as it is shown in Table 1, one tagged fish covered a long distance to the Rügen Island. It is likely, too, that another one which is included among "unknown" in Table 1 was caught in the Western Baltic area as the tag has been returned to us from Sweden.

Thus, the results of eel tagging presented above lead to the following main conclusions:

/1/ Recaptures were mainly caught near the places of tagging that is in the Lower Vistula including the mouth, and in the Gulf of Gdańsk. Simultaneously, no distinct tendency to migrate up the river was noticed.

/2/ Some differences in recovery percentages are likely to reflect the variabilities of fishing intensity which seems highest in the Lower Vistula near Teczev -- according to experiment 1, and 2.

/3/ Some specimens can leave the Gulf of Gdańsk for Western Baltic areas before reaching 60 cm but probably they are not very numerous.

/4/ The method of eel tagging applied in the described experiments was not sufficient, either. Almost all the tags were recovered during two-three months, and only in exceptional cases the tags remained on the fish for fifteen-seventeen months.

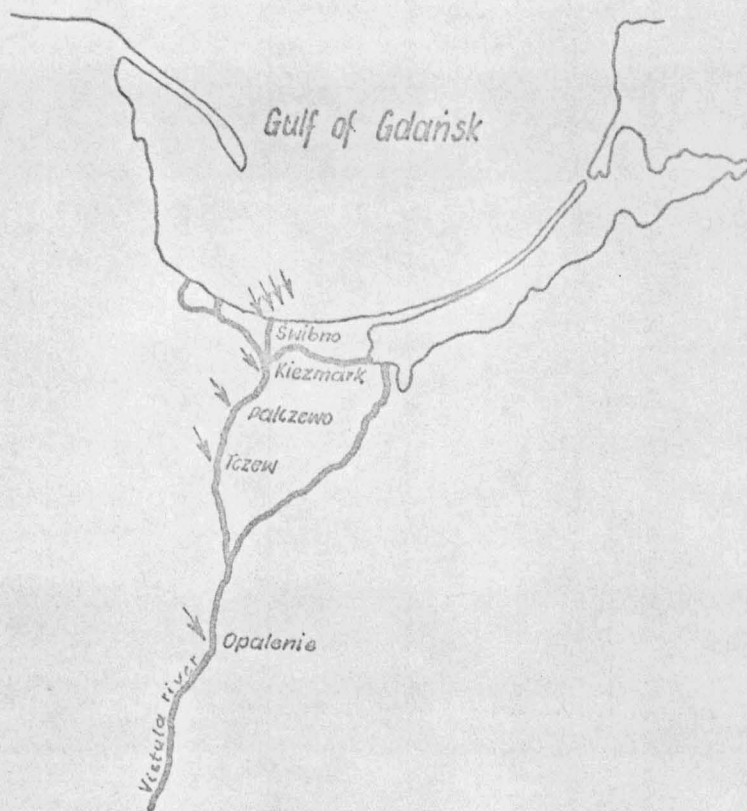


Figure 1. Places of tagged eel release



Figure 2. Catching areas of tagged eel released into the Lower Vistula near Tczew /experiment 1/

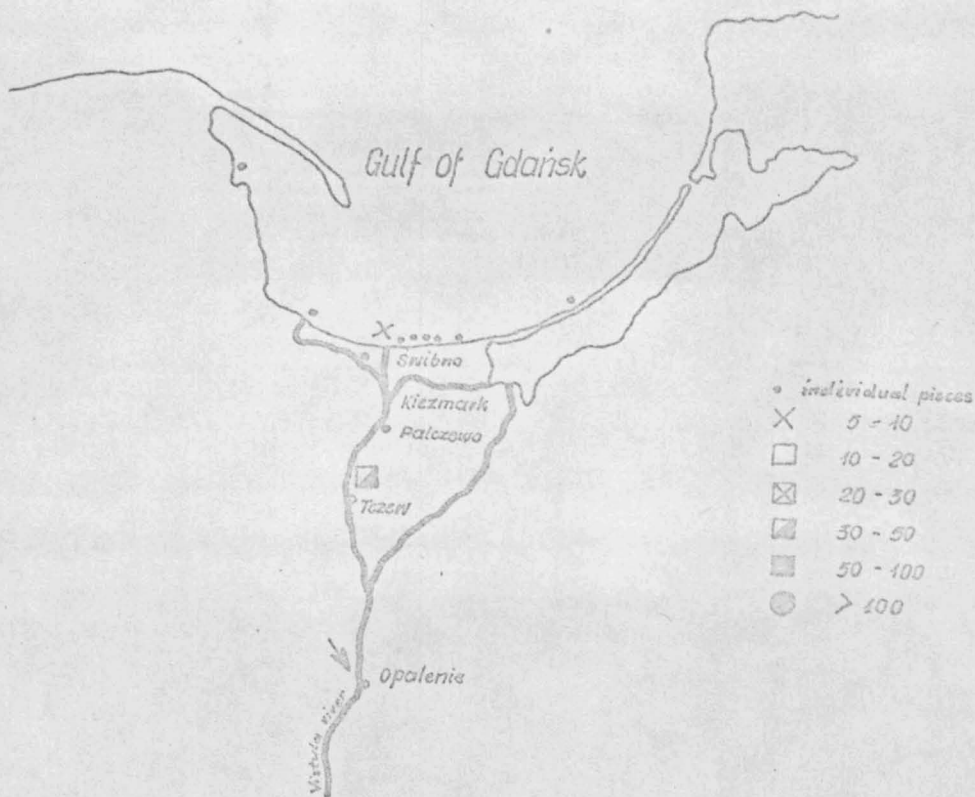


Figure 3. Catching areas of tagged eel released into the Lower Vistula near Opalenie /experiment 2/

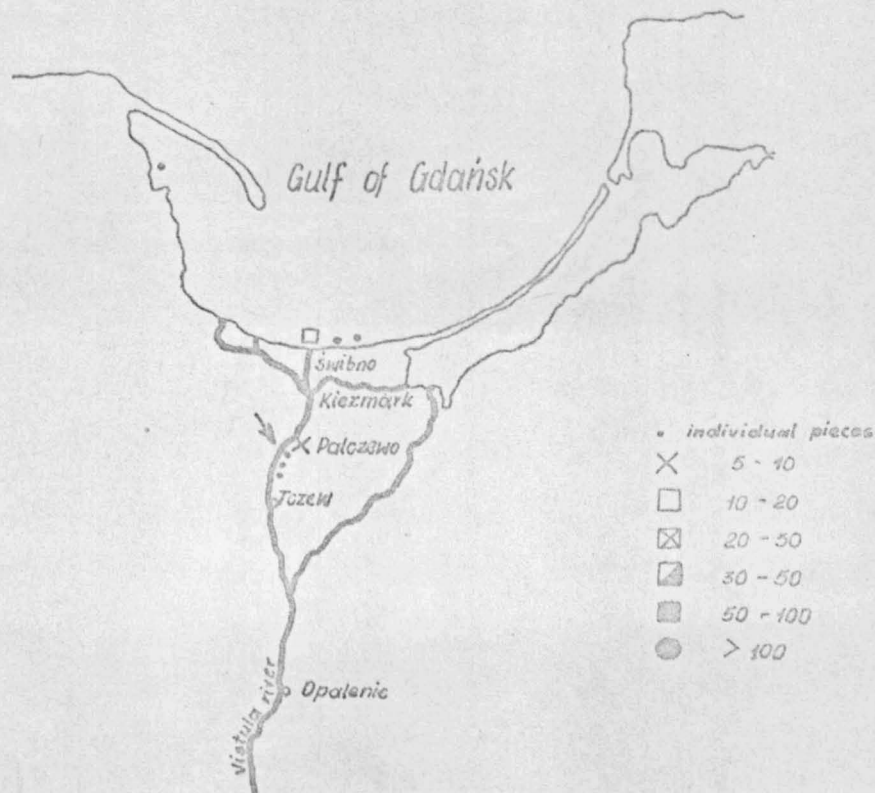


Figure 4. Catching areas of tagged eel released into the Lower Vistula near Palczewo /experiment 3/

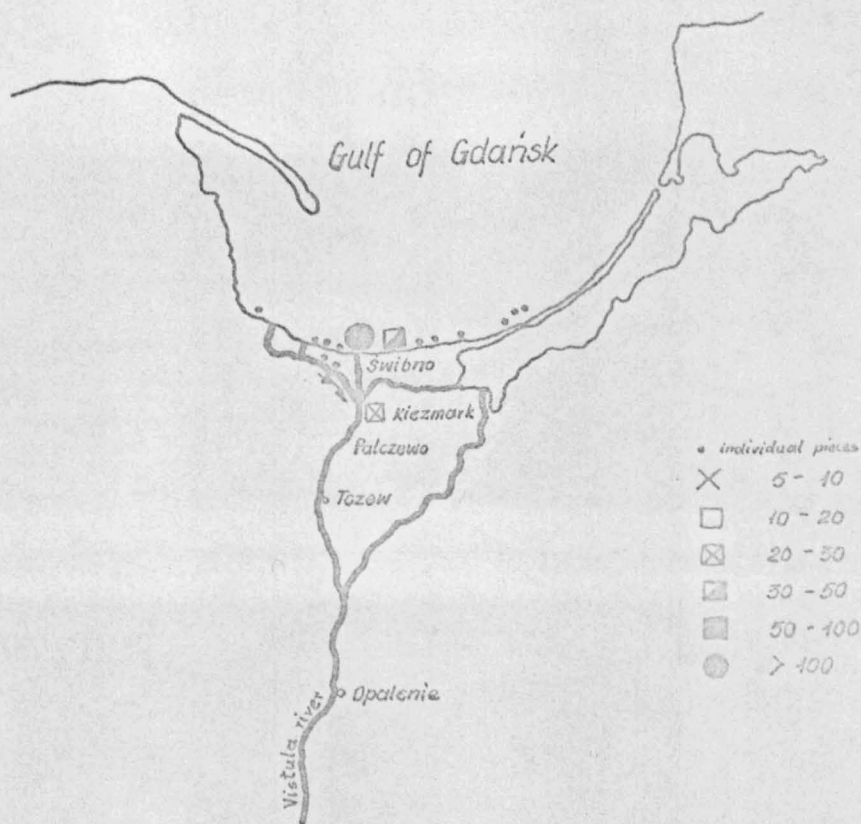


Figure 5. Catching areas of tagged eel released into the Lower Vistula near Kieźmark /experiment 4, and 5/

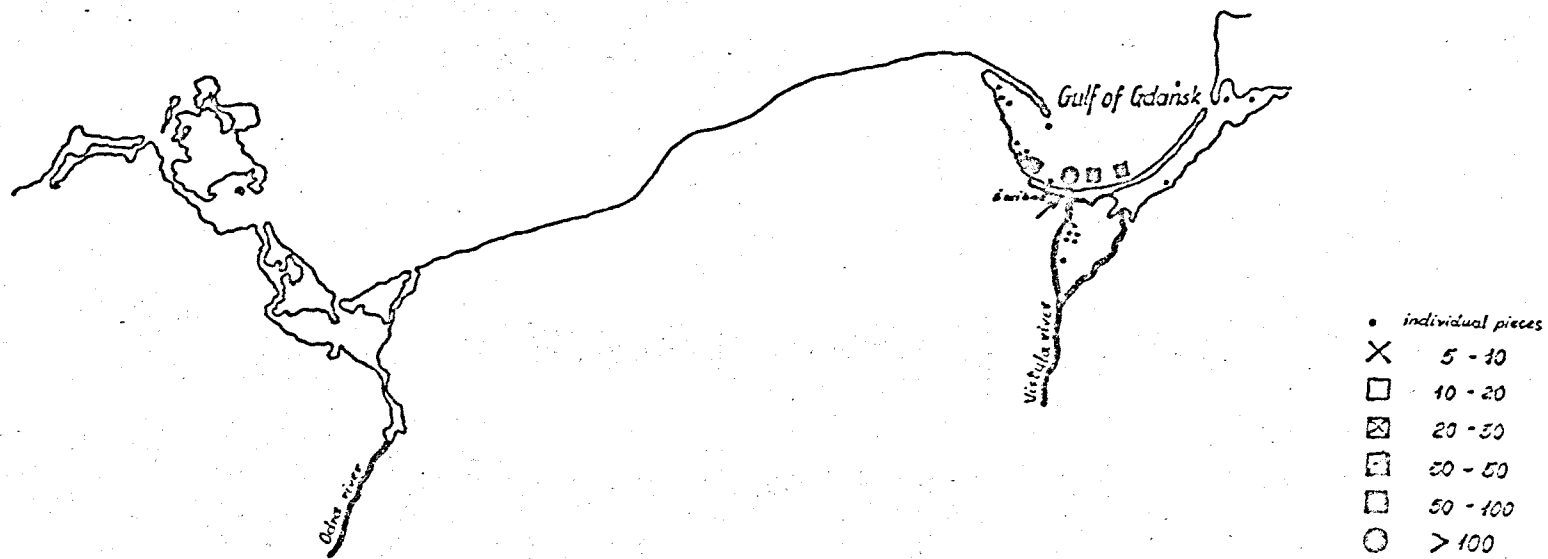


Figure 6. Catching areas of tagged eel released into the Vistula mouth and the Gulf of Gdańsk /experiment 6, 7, 8, 9, and 10/

Table 1 - Eel tagging experiments

No of experiment	Released						
	Date	Place	No	Length range	Mean length	Height	Mean weight
				cm	cm	gr	gr
1	13-20.07.70	Vistula 905 km - Tczew	1683	27-53	38.5	-	-
2	26.06.71	Vistula 867 km - Opalenie	600	24-56	39.3	-	-
3	14.09.71	Vistula 916 km - Palczewo	515	27-48	35.7	-	-
4	11-16.08.71	Vistula 935 km - Kieźmark	947	30-53	43.0	-	-
5	11-20.07.72	"- " " "	1113	30-60	42.8	-	-
6	19.08.70	Vistula mouth	247	34-51	42.9	70-160	113
7	3.09.70	Gulf of Gdańsk 3 n.m. offshore	161	35-52	43.6	80-215	134
8	17.09.70	Gulf of Gdańsk 7 n.m. off shore	97	38-52	43.6	60-190	124
9	1-15.06.71	Gulf of Gdańsk 2-4 n.m. off shore	3335	33-50	42.2	45-170	140
10	11.06.71	Gulf of Gdańsk 8 n.m. off shore	578	30-63	43.9	45-240	131
			4418				

/ Table 1 continued /

No of experiment	C a u g h t												T o t a l		
	Vistula				Gulf of Gdańsk								No	%	
	905 km / Tczew / -920 km / Palczewo	920 km / Palczewo / 935 km / Kiezmark /	Dead Vistula	Vistula mouth	Swibno - Jantar	Jantar - Piaski	Swibno - Gdynia	Gulf of Puck	Hel Peninsula	Vistula Firth	" Rugen Island	Unknown			
1	No	153	7	3	42	16	1	4	1	1	1		229	13.6	
	%	67.0	3.0	1.3	18.4	7.0	0.4	1.7	0.4	0.4	0.4		-	100.0	
2	No	43	1	1	8	4	2	1	1				61	10.2	
	%	70.6	1.6	1.6	13.1	6.6	3.3	1.6	1.6				-	100.0	
3	No	3	8		15	2			1				29	5.6	
	%	10.3	27.6		51.8	6.9			3.4				-	100.0	
4			12	1	56	12		1					82	8.6	
5			14	1	59	29	6	3					112	10.1	
Total	No		26	2	115	41	6	4					194	9.4	
	%		13.4	1.0	59.3	21.1	3.1	2.1					-	100.0	
7	No				12	12			1			1	26	10.5	
8	No				3	1		2	2	1	1		10	6.2	
9	No				2	1	1						4	4.1	
10	No	1	5		120	73	55	34		3		2	293	8.8	
Total	No				6	4	3	5					18	3.1	
Total		1	5		143	91	59	41	3	1	3	1	3	351	7.9
%		0.3	1.4		40.8	25.9	17.0	11.7	0.8	0.3	0.8	0.3	0.8	-	100.0