

A Further Communication Concerning Migration of Sea Trout from Pomeranian Rivers

by

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Tagging experiments of sea trout from Pomeranian rivers flowing into the Baltic between the Vistula and the Odra were carried out by the Polish Angling Association in 1960. The first results were presented at the Salmon and Trout Committee meeting in 1961. These results allow us to state that sea trout from these relatively short rivers undertake long migrations in the Baltic and that their increase in size during the first year of sea life in the Baltic is remarkably big. They are not inferior - which was quite unexpected - to the increase in size of the Vistula sea trout, which was known as being the only so rapidly growing sea trout race.

In the above-mentioned paper data were also presented on the migration from rivers and recapture in the sea of smolts of Pomeranian sea trout released in the spring of 1960 at the following three places:-

a) in the Slupsk Basin	186 individuals
b) in the Parsenta Basin	1458 "
c) in the Wieprza and Grabowa Basin	871 "

From the above amounts the following were recaptured in the smolt size (see Figure 1):-

a) from the Slupsk Basin	2 individuals
b) from the Parsenta Basin	10 "
c) from the Wieprza Basin	2 "

Of these 14 individuals 10 were caught in the sea and 4 in the river. Of these 4, 2 did not start migrating but directed themselves upstream in the Parsenta Basin and were caught after several months. The majority of caught individuals - of the size of a smolt - had performed their Baltic migration of 300-400 km mostly to the east of the estuaries of Pomeranian rivers.

Details concerning the recapture in 1961 and 1962 of individuals grown in the sea from the 3 groups listed above are now being presented.

I. Of individuals released into the Slupia on March 26, 1960, in the number of 186, as mentioned above, 1 individual was caught in the Baltic, near Ustka (see Figure 2) after 348 days, i.e. after nearly one year. During this period it had attained the unusual size of 70 cm and a weight of 3,4 kg. This is the most considerable increase in size and weight of sea trout after one year's life in the Baltic, stated hitherto. 4 individuals, listed in Table 1 (see page 2) were caught in rivers after their return from the sea.

As will be seen from the data contained in Table 1, 3 individuals returned not only to the basin of their release, i.e. the Slupia, but even to its affluent the stream Ryczowo, into which they had been liberated. After 623 days, i.e. after two seasons spent in the sea, they attained dimensions of more than 60 cm and a weight of abt. 2-4 kg. Only one individual "strayed" into the river Grabowa.

Table 1. Sea trout from Slupia caught in rivers after their return from the sea

No.	Tag no.	Place of capture	Date of capture	Number of days	cm	kg
1	3329	Grabowa	15.7.61	478	-	2,36
2	3325	Slupia-Ryczewo	7.12.61	623	65	4,00
3	3309	" "	"	623	61	1,83
4	3369	" "	"	623	62	2,32

II. Of the 1458 individuals released into the Parsenta on April 23, 1960, 12 grown individuals were caught in the sea (data on these are indicated in Table 2) and 4 individuals after their return to the river, see Table 3.

Table 2.

No.	Tag no.	Place of capture	Date of capture	Number of days	cm	kg
1	4226	Baltic, Kotka	6.12.60	228	40	0,70
2	3875	" 10 mile od ujścia Wisly	27.2.61	311	67	3,30
3	3828	" ujście Wisly	20.4.61	344	52	1,10
4	4544	Baltic, Koserowo	9.6.61	409	70	3,20
5	4312	" Zatoka Gdańska	22.8.61	427	-	-
6	4398	" Kolobrzeg	9.7.61	444	54	1,75
7	4755	" Simrishamm Sweden	29.8.61	495	59	2,10
8	4220	" 7 m N.Farösunds Sweden, Gotland	10.10.61	537	71	4,70
9	4275	" 15 m U Wisly	18.10.61	545	70	4,00
10	4750	" k. Kolobrzegu	30.10.61	557	63	-
11	4280	" 30 m NW Brüsteort	13.12.61	601	64	3,50
12	4807	" k Kolobrzegu	28.12.61	616	60	-

On the basis of these data the following may be stated:-

a) Increase of size in the sea:

3 individuals after a period of about 1 year were 52-67 cm long and weighed from 1,75-3,30 kg. Individuals after 2 years in the sea attain a length of 60-70 cm, weighing about 3,5-4,70 kg. The above ratio of growth is not inferior to that of the Vistula sea trout, surpassing it even sometimes in the first year.

b) Direction and extension of migration is shown on Figure 3.

As it appears from the figure, the majority of individuals migrated to the east of the mouth of their rivers. Three individuals were caught near Kolobrzeg, five in the region of the Bay of Gdańsk and to the east of the Vistula estuary. One individual, progressing towards the east, reached the Finnish coastal waters during the first summer (no.4226) in the Bay of Finland, near Kotka (Figure 3). Only one individual was caught to the west of the Pomeranian rivers, in the western region from the mouth of the Odra. It must be stressed that out of 12 fish 2 were caught in Swedish waters (one to the north of Gotland).

As it seems to appear from this first tagging experiment, the individuals liberated in the Parsenta mostly went to the same feeding places as the Vistula sea trout and only exceptionally migrated westwards (similarly to the case of smolts).

However, the statement that some Pomeranian sea trout reached the coast of Sweden and the waters near Gotland is of the greatest interest. It is not known whether they swam directly to these places or whether they reached them having primarily an eastern direction of migration.

Return to the rivers

Of smolts liberated into the river Parsenta 4 individuals returned to the Pomeranian rivers. Data on these are presented below in Table 3.

Table 3

No.	Tag. no.	Place of capture	Date of capture	No. of days	cm	kg
1	3580	river Wieprza-Darlowo	13.11.61	570	57	2,00
2	4096	" Slupia, Slupsk	17.11.61	574	56	2,00
3	4191	Parsenta pkt.Kolobrzeg	10.1.62	629	60	-
4	3634	ujście Parsenty	24.1.62	643	75	-

As will be seen from the Table 3, 2 individuals were caught at the mouth of the river in which they had been liberated, after having spent two entire years in the sea, at the very beginning of the spawning migration (their spawning activities would have taken place in the autumn of 1962).

Two individuals were not caught in the river into which they had been liberated - one was caught in the Wieprza, the other in the Slupia river, both in November, as spawners on spawning grounds (Figure 3).

III. Out of the 871 individuals liberated into the Grabowa (Wieprza Basin), on April 28, 1960, 26 well-grown individuals were caught in the sea and 20 individuals in rivers; of these 17 individuals in the river where they had been liberated and 3 individuals in the Parsenta river.

Contrary to the groups already mentioned, which were released into the Parsenta and the Slupia, the percentage of survival proved to be - up to this date - relatively high in the Grabowa, amounting to 5,3% of the smolts liberated. In this manner (in round numbers) every 19th smolt liberated became a grown salmon (87 smolts produced, in round numbers, 2 sea trout spawners in the river, and 2,6 sea trout caught in the sea).

Individuals caught in the sea are listed in Table 4 (page 4).

a) Increase of size and weight in the sea

As seen from Table 4 the length and weight of sea trout liberated into the Grabowa completely resemble those of the groups released into the Slupia and Parsenta. Their size does not seem to differ - as it appears at present - from the increase in dimensions of the Vistula sea trout.

After the first summer spent in the sea the Pomeranian sea trout attains a length fluctuating between abt. 45 to 55 cm, with a weight of abt. 1 to 2 kg. After 2 summers spent in the sea they attain dimensions of abt. 60 to 70 cm and a weight of abt. 3,2 to 4,8 kg.

Independently of the river into which they have been liberated, the size of the Pomeranian sea trout in the Baltic fluctuated approximately within the similar limits. The rate of growth of all sea trout liberated into 3 rivers and caught in the Baltic is represented graphically. Increase in length is shown in Figure 5, increase in weight in Figure 6. On both diagrams the individuals are listed in chronological order on the vertical axis, stating on the horizontal axis length and eventually their weight.

Table 4

No.	Tag no.	Place of capture	Date of capture	No. of days	cm	kg
1	5733	Baltic, Grisslan Zatoka Botnicka	8.11.60	195	45	1,00
2	5047	" Sudersant Farö, Sweden	27.11.60	214	43	1,00
3	5481	" Brüsterort	10.12.60	227	50	1,00
4	5217	" Stegna	1.2.61	280	55	2,00
5	5343	" Low. TU-7	10.2.61	289	-	2,00
6	5484	" Gotland Kyrviken Farö	13.2.61	292	47	1,10
7	5341	" 4 km od ujścia Wisły	21.2.61	300	49	1,40
8	5383	" Stegna	"	300	53	1,50
9	5137	" Krynica Morska	24.2.61	303	52	2,80
10	5513	" " "	27.2.61	306	50	1,40
11	5315	" między Katami & Krynica	9.3.61	317	51	1,45
12	5309	" ujście Wisły Jantar	4.61	ab.365	46	0,80
13	5658	" " "	4.61	ab.365	-	-
14	5113	" Kolobrzeg	17.7.61	447	58	2,40
15	5489	" Mierzyno	16.8.61	477	47	1,70
16	5495	" E-Gotland	11.10.61	533	58	2,30
17	5779	" Gdynia	30.10.61	552	68	-
18	5362	" Rosewie (zwrot z Danii)	10.11.61	563	69	4,10
19	4154	" Södersands viken Sweden	20.11.61	573	45	1,80
20	5148	" Bornholm	"	573	71	4,80
21	5828	" Brüsterort (zwrot z Danii)	27.11.61	580	80	3,10
22	5519	" Gotland	20.12.61	603	68	3,23
23	5248	" ujście Wisły	28.12.61	611	78	4,40
24	5329	Zat. Gdańska 3 m na W. Helu	27.1.62	641	74	3,30
25	5425	Baltic - Mikoszewo	27.2.62	672	68	4,10
26	5195	" reda portu Ustka	"	672	72	3,11

b) Direction and extent of migration (see Figure 4).

It is seen that individuals liberated into the Grabowa, similarly as was demonstrated for those released in the Parsenta, migrated, in great majority, eastwards in the Baltic (2 out of 26 individuals were caught in the region of Ustka and Kolobrzeg and 16 in the region of the Bay of Gdańsk and to the east of the Vistula estuary). Only 1 sea trout was caught in the region of the mouth of the Odra, and another one more towards north-west, near the island of Bornholm.

It must be stressed that of the remaining 7 sea trout 6 individuals were caught in waters of the Gotland region, and 1 migrated far to the north into the Gulf of Bothnia. This last individual, released in spring and captured already in autumn in the region of Söderhamn, had attained a length of 45 cm and a weight of 1 kg during this migration, and its route, in a straight line from the point of liberation amounted to about 890 km. This is the most northern stand, as stated hitherto, attained in the Baltic by a Pomeranian sea trout.

The tagging described here permitted to ascertain, for the first time, that not only Vistula sea trout, but also Pomeranian sea trout may be caught in Swedish waters even in a greater percentage, since 7 out of 26 sea trout from Grabowa were caught in Swedish waters.

Return to the rivers (see Figure 4).

20 individuals of a group of 871 individuals, liberated into the river Grabowa (Wieprza Basin) on April 28, 1960, returned to Pomeranian rivers after growth in the sea; of these 17 returned to the place of release, and only 3 "strayed" into the Parsenta. Details concerning these individuals are given in Table 5 (page 5).

17 individuals caught in the river Grabowa represent a material on which certain general conclusions can be formulated; to the spawning population of sea trout in this river belong individuals that have left the sea after a stay of nearly 1 year (the first four individuals in the table). They enter the river already in February, to take part in the autumn spawning. Moreover, 12 individuals caught in the river during the spawning period, from the end of October till the beginning of December, could also have entered the river at the beginning of the

the summer or in the autumn, when their growth in the sea might have been accomplished in a part of the second summer season or during its entirety. Investigation of scales will allow for elucidation of this question.

The fact of a deliberate choice in finding the river into which the fish had been liberated, in spite of the vicinity of estuaries of other Pomeranian rivers, is the most interesting and has been confirmed by material from the river Grabowa.

In this manner experiments carried out by Allen & Donaldson, in the United States, on the return of silver salmon (1957) to the points of their liberation, and not to the place of their origin, have been confirmed on the European waters in the species Salmo trutta. Heterogeneous material from different Pomeranian rivers, liberated into the Grabowa mostly returned to this river.

Table 5.

No.	Tag no.	Place of capture	Date of capture	No. of days	cm	kg
1	5846	Grabowa - Jezyczki	15.2.61	294	57	2,00
2	5722	" "	17.2.61	296	60	1,80
3	5507	" "	20.2.61	299	65	2,50
4	5091	" "	"	299	55	1,50
5	5306	Parsenta	25.6.61	425	61	2,55
6	5160	"	29.6.61	429	57	2,33
7	5451	Grabowa - Jezyczki	27.8.61	488	76	2,76
8	5503	" - Zielenica	23.10.61	545	59	2,60
9	5834	" - Jezyczki	1.11.61	554	66	2,50
10	5557	" - Zielenica	3.11.61	556	60	2,40
11	5508	" - Jezyczki	11.11.61	564	60	2,00
12	5152	" "	12.11.61	565	61	2,00
13	5843	" "	"	565	61	2,10
14	5091	" Zielenica	14.11.61	567	62	2,40
15	5561	" "	"	567	61	2,00
16	5808	" "	"	567	59	1,80
17	5191	" Jezyczki	18.11.61	571	56	1,60
18	5179	" "	26.11.61	579	61	1,80
19	5565	" "	10.12.61	593	65	2,00
20	5402	Parsenta, Kolobrzeg	12.61	ab.600	53	1,50

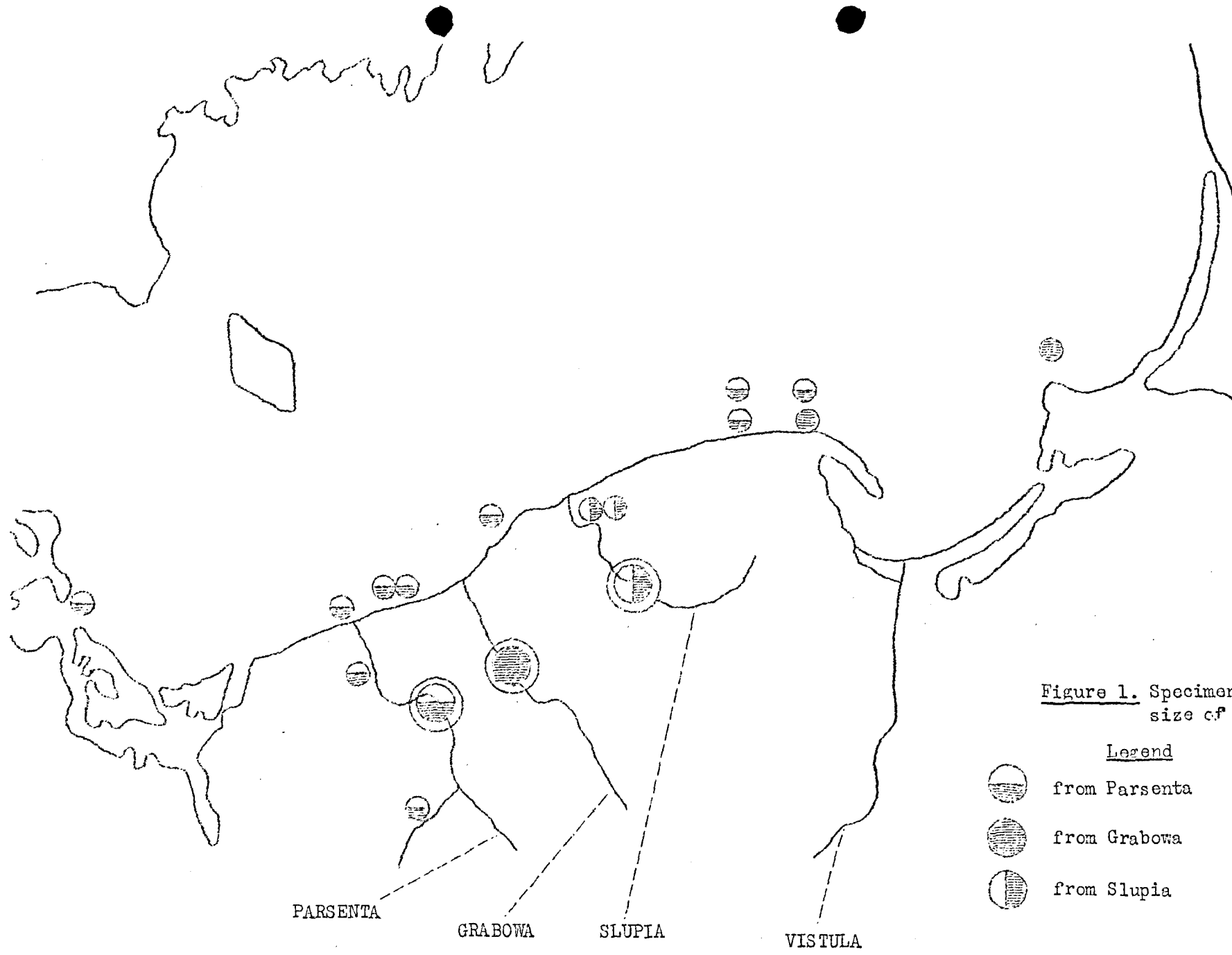





Figure 1. Specimen recaptured in the size of smolt in 1960.

Legend

-  from Parsenta
-  from Grabowa
-  from Slupia

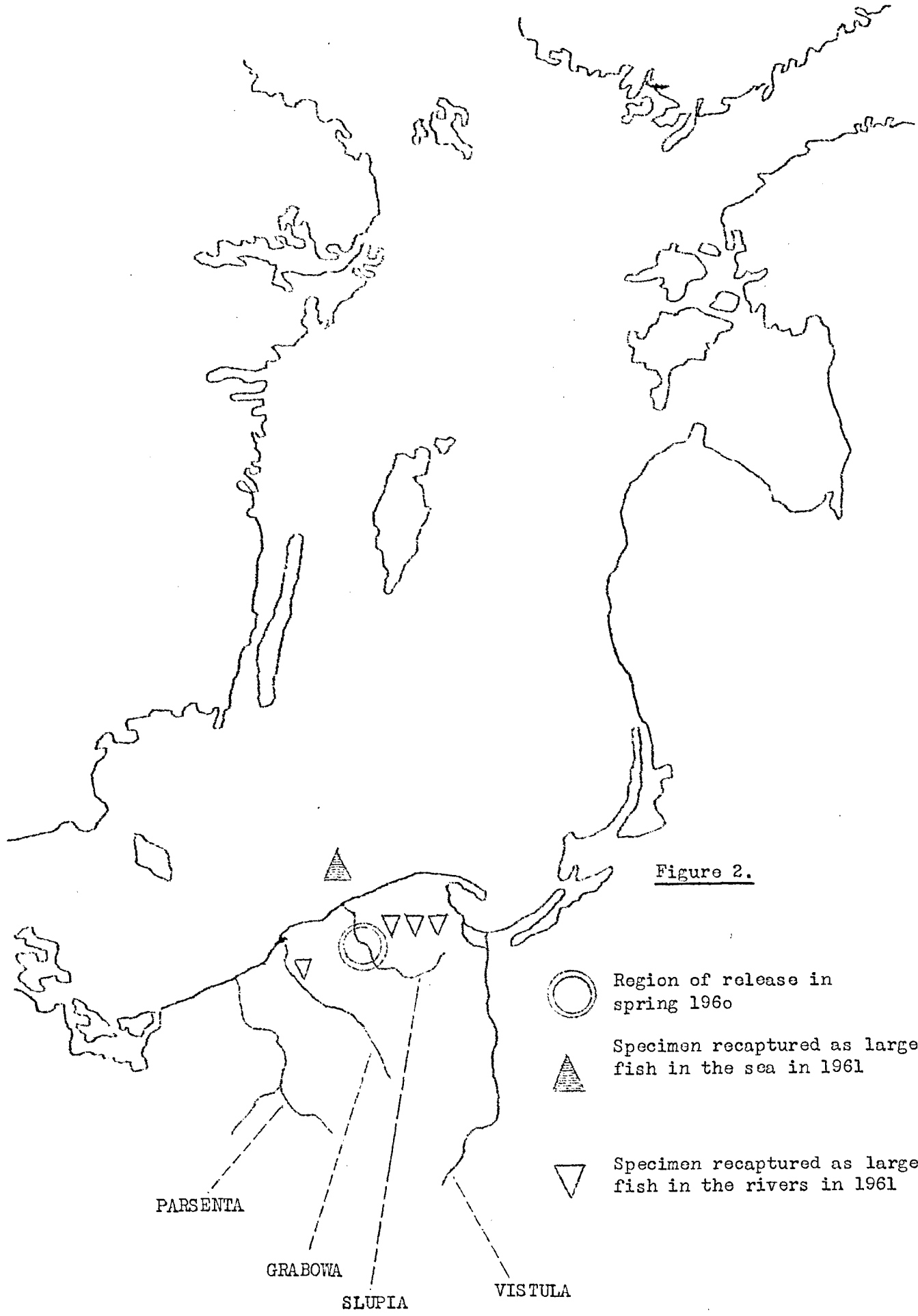




Figure 3



Region of release in spring 1960



Specimen recaptured as large fish in the sea, 1960, 1961



Specimen recaptured as large fish in the rivers, 1961, 1962.

PARSENTA  
 GRABOWA  
 SLUPIA  
 VISTULA



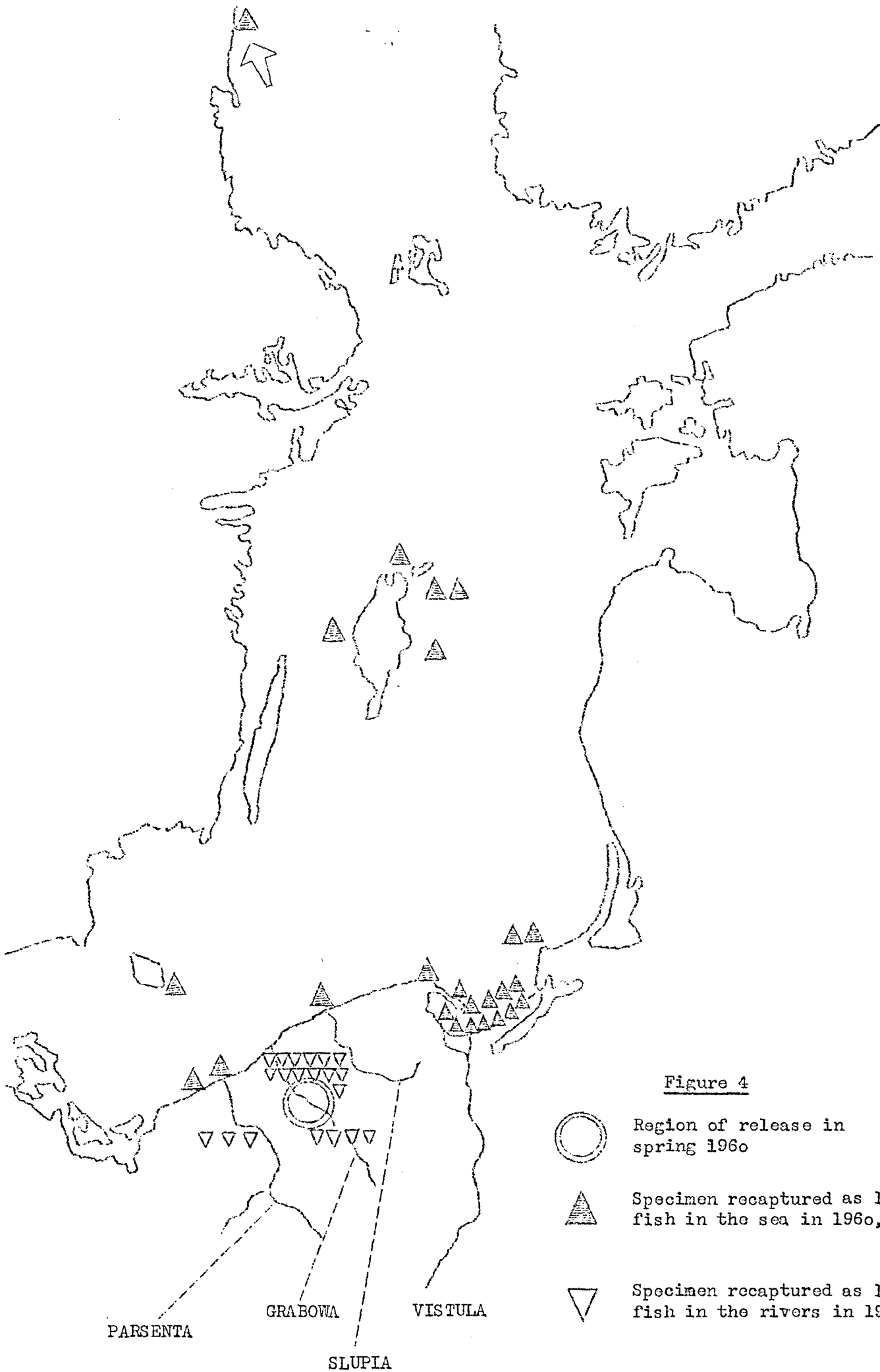


Figure 4



Region of release in  
spring 1960



Specimen recaptured as large  
fish in the sea in 1960, 1961, 1962.



Specimen recaptured as large  
fish in the rivers in 1961

PARSENTA

GRABOWA

VISTULA

SLUPIA



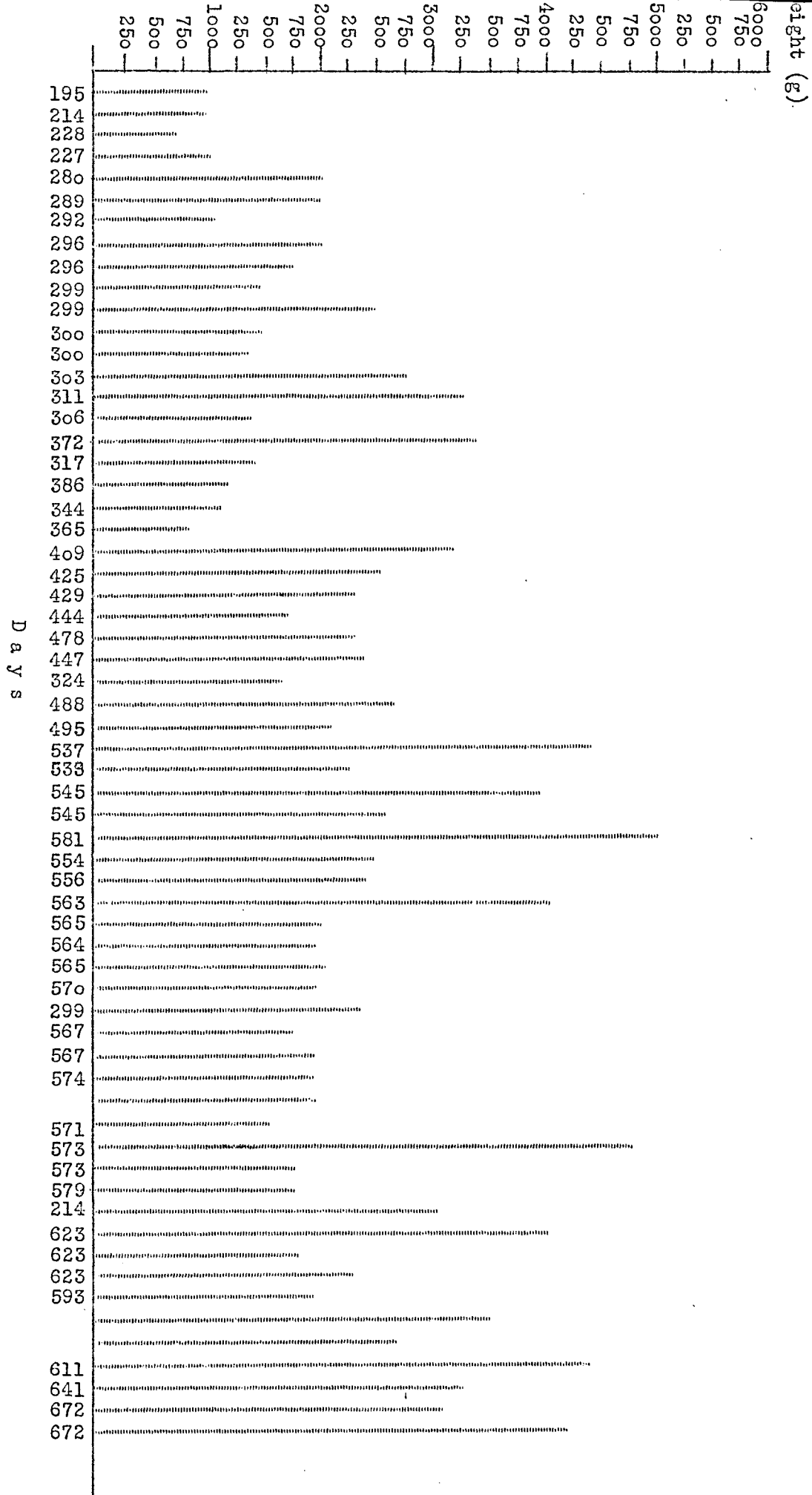


Figure 6