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**SALMON (*SALMO SALAR* L.) AND TROUT (*SALMO TRUTTA* L.) FISHING  
AND STOCKING IN THE LOWER Odra RIVER SYSTEM**

**POŁOWY ŁOSOSIA (*SALMO SALAR* L.) I TROCI (*SALMO TRUTTA* L.)  
W SYSTEMIE DOLNEJ ODRY ORAZ ZARYBIANIE**

The paper presents and analyzes the catches of salmon and trout in the Szczecin Firth and lower Odra River as well as in the rivers Warta and Noteć over the period of 1952–1972. The both species had to be treated jointly because such is the case with informations given by the economic statistics available to the authors. A year-to year, between-season and between-region variabilities were considered. Fish caught by the German (GDR) fishermen were also taken into account. Additionally, the post-war data concerning the lower Odra stocking with salmon and trout are collected.

**INTRODUCTION**

Salmon (*Salmo salar* L.) is one of the most valuable species in our ichthyofauna. It is supposed, however, that the last site in Poland available for the species to spawn and grow is the Pomeranian river of Drawa (Fig. 1). Over the recent years the spawning stock of this population has been observed to rapidly decrease in its abundance (Chełkowska and Chełkowski, 1974a). A high fishing mortality of salmon migrating up the Szczecin Firth, lower Odra, Warta and Noteć seems to be one of the reasons for this state of affairs. Therefore an attempt was made to analyze the statistics dealing with catches; salmon and trout are treated, jointly in them so the specific composition of the catches lies beyond the scope of this paper and is discussed elsewhere (Chełkowski, Chełkowska and Kisielnicka, 1976).

The available literature gives only some fragmentary data on salmon and trout fishery in the river Warta and Szczecin Firth system; moreover, the data concern mainly the post-war period (Chełkowska and Chełkowski, 1968–1974; Chełkowski, 1966, 1967; Chrzan, 1961, 1962, 1964, 1969; Iwaszkiewicz, 1966; Kaj, 1953, 1954; Talarczak, 1951).

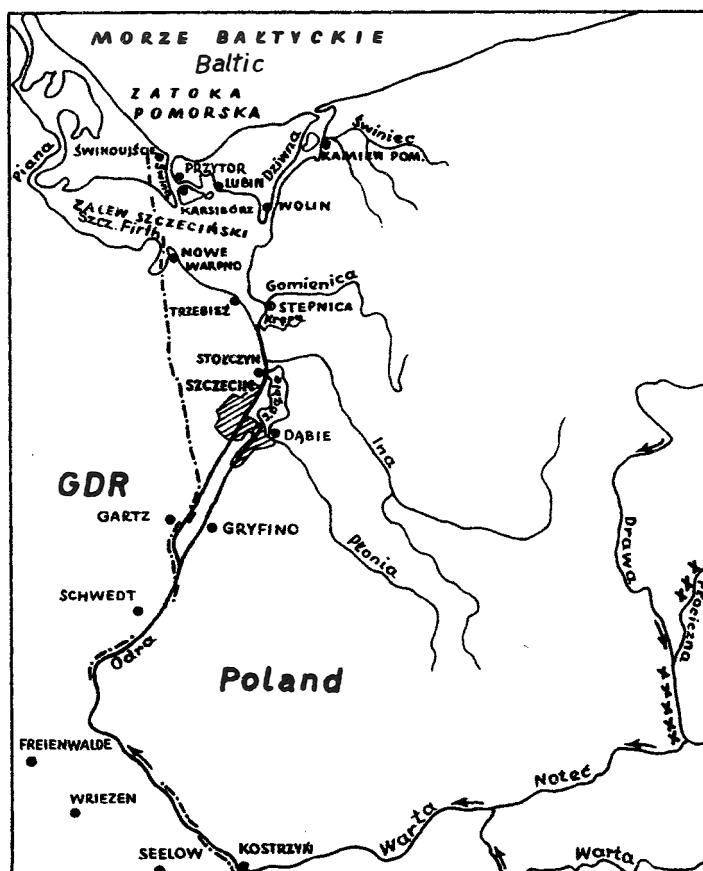


Fig. 1. The lower Odra and Szczecin Firth basin  
xxx — salmon spawning grounds  
- - - state border

The Odra system stocking with salmon and trout within the previous years, the information about which is partly available from the papers by Stankiewicz (1949), Kaj (1953), Chełkowski (1967), Chełkowska and Chełkowski (1968–1974) and Bartel (1971), is also dealt with here in connection with catches.\*

### MATERIAL AND METHODS

The investigations covered salmon and trout catches from the Szczecin Firth and adjacent waters, the lower Odra and Lake Dąbie as well as from lower Drawa and Noteć.

The Szczecin Firth with its adjacent waters covers a water area restricted by the mouths of Dziwna, Piana and Swina as well as the mouth of Krępa (Mikołajski, 1966).

\* Dr. Roman Sych is thanked for his valuable suggestions offered during the course of this work.

The lower Odra extends from the mouth of Krępa to that of Warta, while the lower Warta is defined as this part of the river which leads from Odra to the mouth of Noteć; the lower Noteć is stretched from Warta to the mouth of Drawna.

The Szczecin Firth with its adjacent waters covers 87,881 hectares, 53.2% of which belongs to Poland and 46.8% to GDR (Grodek, Kiełczewska-Zalewska and Zierhoff *et al.*, 1948; Mikołajski, 1960; Talarczak, 1951). The lower Odra encompasses about 9,320 hectares, 89.9% of which belongs to Poland and 10.1% to GDR (Table 1).

Table 1

## Areas of the Szczecin Firth and Lower Odra

Region		Total area	Poland	GDR
Szczecin Firth	ha	87881	46784	41097
	%	100.0	53.2	46.8
lower Odra-river	ha	3750*	2812	938
	%	100.0	75.0	25.0
Lake Dąbie	ha	5570	5570	—
	%	100.0	100.0	—
lower Odra — total	ha	9320	8383	937
	%	100.0	89.9	10.1

— tentative data obtained from the „Przyszłość Rybacka” Cooperative, Gryfino.

Polish and German fishermen catch salmon and trout using various gear, mostly fyke nets and seine, more seldom gill and trammel nets.

The basic statistic material was derived from financial certificates, from which the information concerning amounts of salmon and trout caught by fishermen from individual ports was retrieved.

The amount of catches contributed by the Polish part of the Szczecin Firth and lower Odra was recorded by the „Certa” Fishing and Processing Cooperative, Szczecin, while informations on those from the German part were obtained from Oberfischmeisteramt für See und Küstenfischerei, Rostock, GDR. The „Przyszłość Rybacka” Cooperative, Gryfino supplied the data on catches from farther part of the lower Odra, from Warta and Noteć. The German materials related to the lower Odra were also taken advantage of; they were obtained from „Produktionsgenossenschaft werktätiger Fischer”: Gartz, Schwedt, Freienwalde, Wriezen and Seelow. Our fishermen of Kostrzyń and the Germans from Frankfurt/Oder unanimously state that salmon and trout have not been found in catches from Odra above the mouth of Warta since World War II at least, which is supported also by Iwaszkiewicz (1966).

Fish weights were recorded with 0.1 kg accuracy.

Table 2

Catches (kg) of salmon and trout from the Szczecin Firth, lower Odra, Warta and Noteć

Year	Szczecin Firth			Lower Odra					Warta	Noteć	Total
	Poland	GDR	total	Poland			GDR	total			
				river	region		river				
					off Stołczyn	Lake Dąbie					
1952				4.0			3.0	7.0			7.0
1953				14.0			—	14.0			14.0
1954				—				—			—
1955				—				—			—
1956	141.5		141.5	3.0				3.0			144.5
1957	83.0		83.0	—		3.5		3.5			86.5
1958	44.0		44.0	3.0	5.0	4.0		12.0			56.0
1959	201.0		201.0	88.0		47.0		135.0			336.0
1960	165.8	1146.0	1311.8	46.0	30.0	7.0	16.5	99.5			1411.3
1961	144.5	1564.0	1708.5	118.7	29.0	19.0	28.5	195.2	38.5	105.0	2047.2
1962	519.0	1541.0	2060.0	49.1	23.0	43.0	42.0	157.1	151.5	43.5	2412.1
1963	414.0	931.0	1345.0	59.2	16.0	91.5	44.5	211.2	87.0	—	1643.2
1964	768.3	2214.0	2982.3	59.2	116.0	53.5	22.0	250.7	85.5	45.0	3363.5
1965	451.0	1294.0	1745.0	33.2	61.0	8.3	30.5	133.0	120.0	—	1998.0
1966	791.4	1192.0	1983.4	29.0	42.5	37.5	8.5	117.5	15.0	14.0	2129.9
1967	1111.2	878.0	1989.2	14.0	81.0	39.0	2.0	136.0	—	—	2125.2
1968	1522.8	1643.0	3165.8	36.0	305.5	172.5	6.5	520.5	—	3.0	3689.3
1969	1068.3	738.0	1806.3	17.3	309.0	65.6	6.5	398.4	—	—	2204.7
1970	929.0	729.0	1658.0	6.3	281.7	38.3	11.0	337.3	—	—	1995.3
1971	1694.8	888.0	2582.8	34.8	302.2	131.9	—	468.9	—	—	3051.7
1972	1945.8	1085.0	3030.8	36.7	281.5	140.9	4.0	463.1	—	—	3493.9
Total:	11995.4	15843.0	27838.4	651.5	1883.4	902.5	225.5	3662.9	497.5	210.5	32209.3

The German data for the whole period investigated as well as the Polish ones until 1959 dealt with fish not gutted; the Polish records for the later period covered bled and gutted fish.

The materials up to 1960 cannot be comprehensive enough, but in spite of that they seem to reflect a tendency towards low catches occurring then (Table 2).

The data related to fish stocking were collected in: Ministry of Agriculture, Warsaw, Central Fisheries Board, Szczecin, District Offices in Szczecin and Koszalin, Sea Offices in Szczecin and Koszalin, Regional Branches of the Polish Anglers Association (PAA) in Szczecin and Koszalin\* (Table 3).

### ANNUAL CATCH

The materials collected indicate that the overall catches amounted to 27,838.4 kg of salmon and trout in the Szczecin Firth, 3,662.9 kg in the lower Odra, 497.5 kg in Warta, and 210.5 kg in Noteć. A mean annual catch of salmon and trout in the Szczecin Firth within 1960–1972 amounted to 2105 kg.

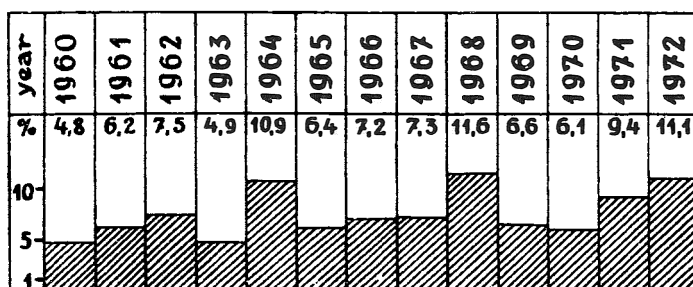


Fig. 2. Percentage composition of salmon and trout catches from the entire Szczecin Firth over 1960–1972 (the sum/kg) of catches from 1960–1972 (assumed as 100%)

Throughout this period the catches varied greatly from year to year, the range of variation being 1345–3165.8 kg. High catches were noted in 1964, 1968, 1971, and 1972 (Fig. 2).

A mean annual catch from the lower Odra (considered jointly with the Lake Dąbie, Warta and Noteć) within 1961–1972 amounted to 341.4 kg. The annual variations ranged within 130–523.5 kg. High catches in this region occurred in the same years as in the Szczecin Firth (Fig. 3).

Changes in catches of salmon and trout in the lower Odra system within 1960–1972 are presented as a regression line (Romanowski)\*\*

\* Our sincere thanks are due to all institutions and individuals contributing to our collection of materials both at home and in the German Democratic Republic.

\*\* Romanowski W., 1951: Zastosowanie statystyki matematycznej w doświadczeniach. [Application of the mathematical statistics to the experimentation]. Warszawa.

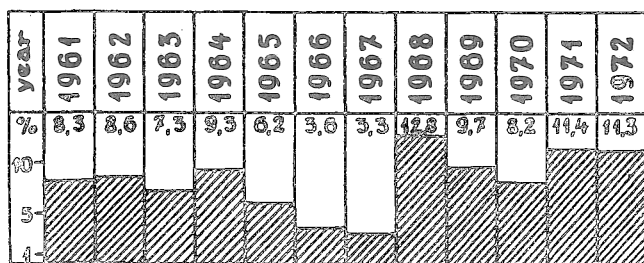


Fig. 3. Percentages of Polish and German catches of salmon and trout from the lower Odra, Warta and Noteć over 1961–1972 (the sum/kg) of catches from 1961–1972 assumed as 100%

$$\hat{y} = a + b \cdot t$$

where:  $y$  = catch

$t$  = year (in the calculations 1960 = 1, 1962 = 2, 1963 = 3 ... 1972 = 13).

The following equation was obtained:

$$\hat{y} = 1723.60 + 100.64 t$$

The regression coefficient  $b = +100.64$  gives evidence of an increasing tendency in catches in spite of considerable fluctuations, an average annual increment in catches amounting to about 100 kg (Fig. 4).

Neither the Polish nor German catches of salmon and trout from the Szczecin Firth in consecutive years (1960–1972) were stable. Polish fishermen in general were increasing their catch from year to year, while the Germans fished less and less (Fig. 5). In 1967 our fishermen for the first time caught more salmon and trout than their German colleagues. The total catch within the period discussed amounted to 11,525.9 kg (42.1%) and 15,843.0 kg (57.9%) from the Polish and German parts of the Szczecin Firth, respectively. It should be borne in mind that the part of the Szczecin Firth administered by the GDR is smaller by 6.4% than that belonging to Poland.

Over 21 years of study (1952–1972) our fishermen caught more salmon and trout from the lower Odra and Lake Dąbie than their German colleagues; the respective amounts are 3437.4 kg (93.8%) and 225.3 kg (6.2%). The Polish fishermen operate on the lower Odra area 9 times larger than that available to the Germans.

### MONTHLY CATCHES

Month-to-month fluctuations and monthly catches of salmon and trout are very interesting to follow due to our desire to detect the time of inland spawning migrations of fishes grown on feeding grounds in the sea. The materials concerning the Szczecin Firth as a whole, collected from 1960–1972 indicate that 91.4% of the entire annual catch were obtained in seven subsequent months, from April through October, the remaining five months yielding considerably less fish (only 8.6%). The largest catches were recorded in July, April and September, 18.8, 16.8 and 16.4%, respectively (Fig. 6).

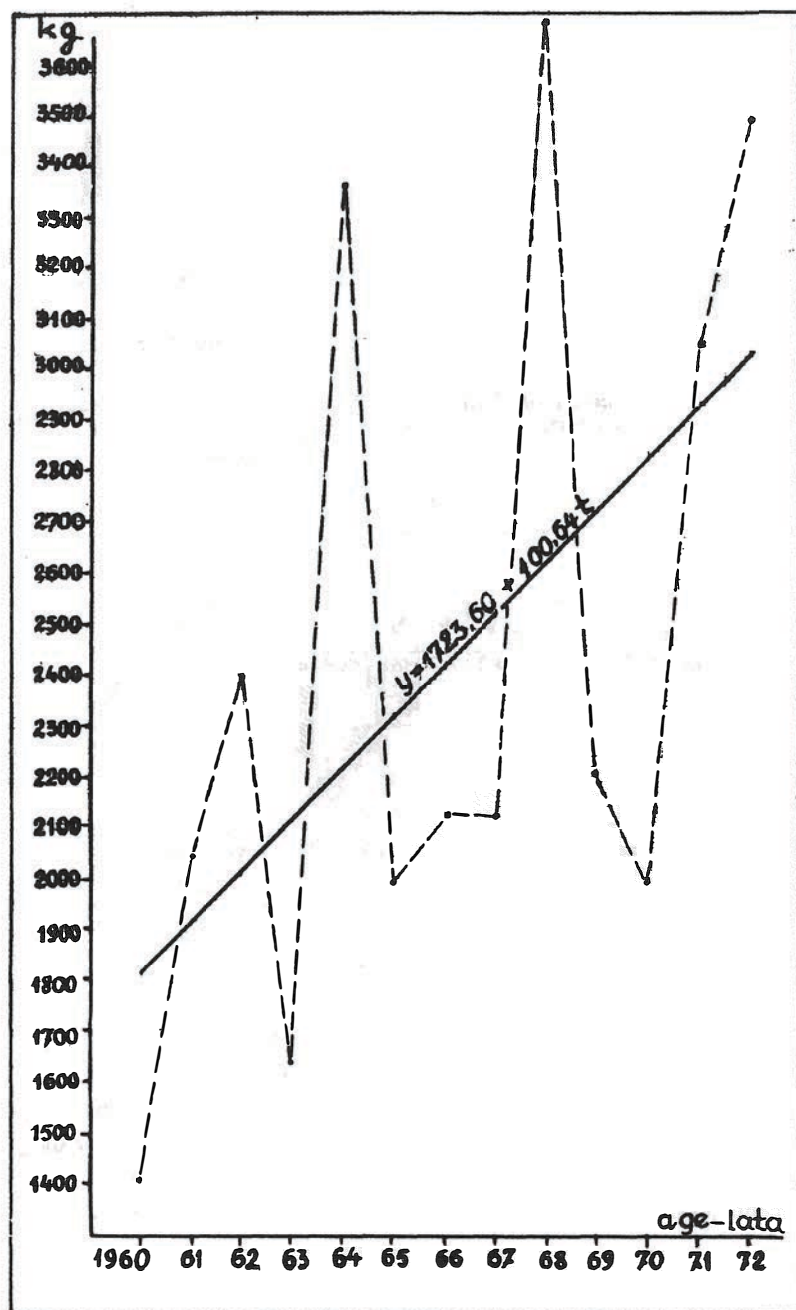


Fig. 4. Amounts of salmon and trout caught in the lower Odra system over 1960–1972

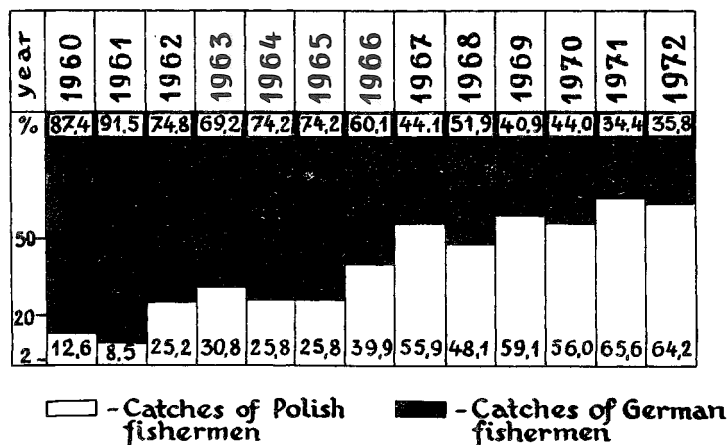


Fig. 5. Percentages of salmon and trout catches from the Polish and German parts of the Szczecin Firth over 1960–1972 (the sum/kg) of catches from 1960–1972 assumed as 100%

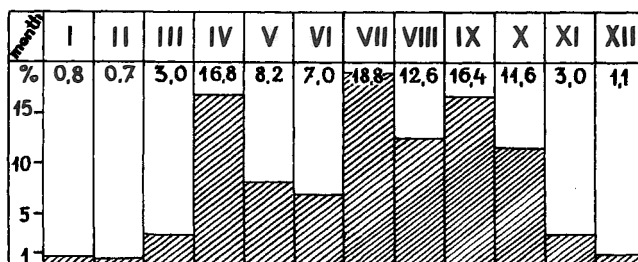


Fig. 6. Monthly percentages of salmon and trout catches from the entire Szczecin Firth over 1960 – 1972 (the sum/kg) of catches from 1960–1972 assumed as 100%

Comparing the percentage ratio of salmon and trout catches from the Polish and German parts of the Szczecin Firth we can note that the German fishermen catch more fish from January through August, while the Poles contribute more from September through December (Fig. 7). Undoubtedly, fish caught during the first half of the year are technologically a better raw material than those obtained during the other half.

The percentages of salmon and trout catches from the lower Odra, Warta and Noteć in particular months show a different picture. The materials concerning the Polish catches over 1961–1972 (Fig. 8) indicate the largest catches taking place in September – October (54.6%), while much smaller results (29.2%) were obtained in July – August and November. The percentages contributed by the remaining seven months (January – June and December) were small – 16.2%.



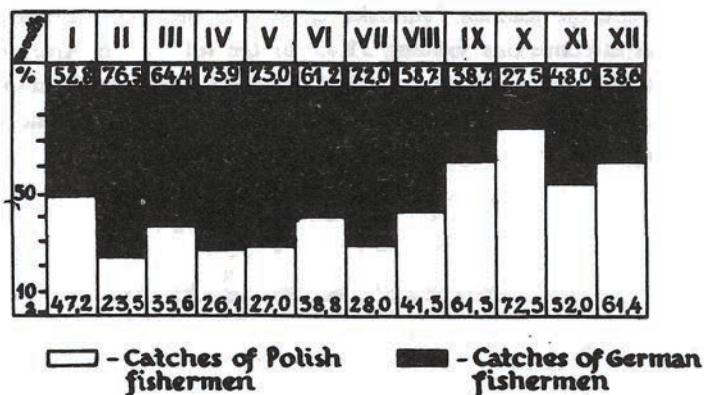


Fig. 7. Monthly percentages of salmon and trout catches from the Polish and German parts of the Szczecin Firth over 1960–1972 (the sum/kg) of monthly catches from 1960–1972 assumed as 100%

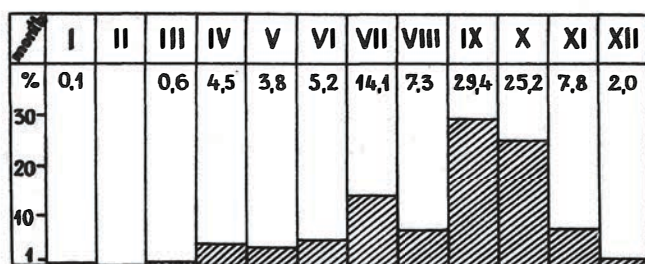


Fig. 8. Monthly percentages of salmon and trout catches from the Polish part of the lower Odra, Warta and Noteć over 1961–1972 (the sum/kg) of catches from 1961–1972 assumed as 100%

It should be remembered that salmon and trout were under complete protection from November 1 till December 31 in the Polish part of the Szczecin Firth, while in the inland waters from April 15 till May 31 and from December 1 till January 31. The above – mentioned results obtained during the protection period constitute so-called „by-catch”. German fishermen were limited by no protective periods; they observed only, like our fishermen did, a protective fish size up to 45 cm in length (*longitudo totalis*).

#### CATCHES IN REGIONS

The salmon and trout catches were worked out in the regional aspect using data from the Polish part of the Szczecin Firth. In order to comprehend the issue in its entirety it would have seemed purposeful to analyze the data from German regions of the Szczecin Firth and lower Odra, but the authors did not have any access to the necessary materials. The Polish part of the Szczecin Firth was divided into 9 regions (Fig. 9). Data from

1967–1972 indicate the Kamień Pomorski region, i.e., the river Dziwna with Kamień Bay, as the most effective one yielding 31.6% of the total catch. Also the regions off Trzebież and Stepnica were quite productive, giving 18.2 and 16.9%, respectively. The pooled catch from the three regions mentioned amounted to 67.7%. The remaining six regions were less productive giving 32.3% of salmon and trout catch.

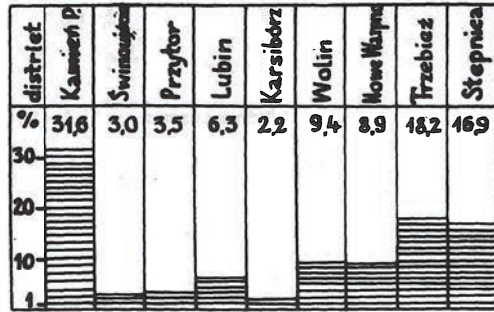
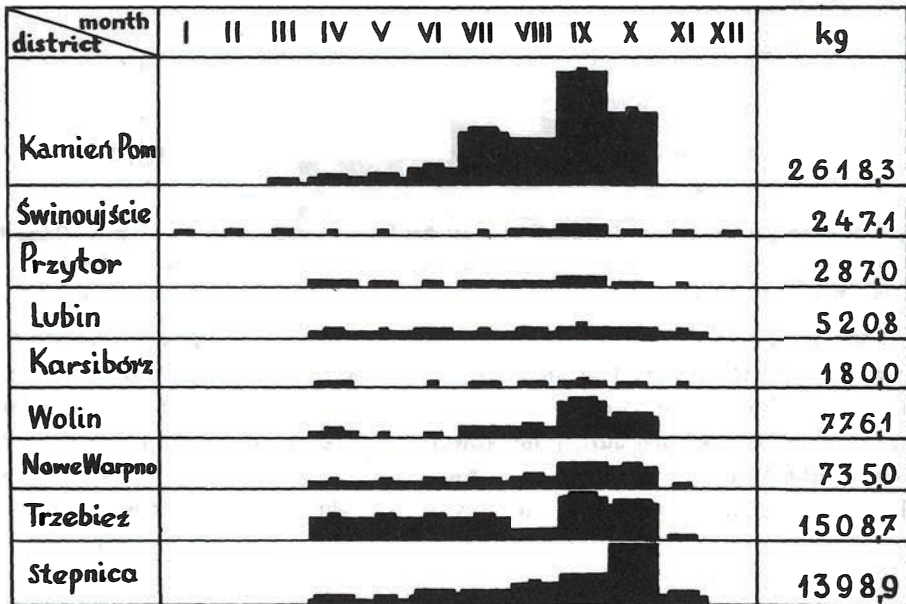


Fig. 9. Percentages of salmon and trout catches from the particular regions of the Polish part of the Szczecin Firth over 1967–1972 (the sum/kg) of catches from 1967–1972 assumed as 100%



■ = 1%

Fig. 10. Monthly and regional percentage composition of salmon and trout catches from the Polish part of the Szczecin Firth over 1967–1972 (the sum/kg) of catches from 1967–1972 assumed as 100%

Another point of interest were the monthly catches from the regions. The materials obtained revealed that only the regions off Kamień Pomorski and Świnoujście were being operated on, with small catches obtained, in January, February and March. In the next five months (April – August) salmon and trout appear in all the regions, the catches tending to increase (Fig. 10). The highest catches are recorded in September except for the region off Stepnica where the catches are at their highest in October, which is undoubtedly connected with spawners gathering in the river Gowienica to spawn, the river draining into the Stepnica Bay. It should be mentioned in this place that the river Gowienica is each year (starting from 1960) stocked with young trout (Table 3). The November and December catches fall rapidly due to the lack of grown-up salmon and trout in the Firth and due to the protection period.

Data related to catches from the lower Odra, Warta and Noteć over the period of 1961–1972 indicate the highest catches of 47.5% obtained from the region off Stołczyn, covering the terminal part of the lower Odra and the northern Lake Dąbie. A smaller catch of 21.6% was recorded from the region of Lake Dąbie; thus both the regions, forming the river Odra mouth produced 69.1% of the total catch. The remaining inland regions gave very low catches amounting to 12.7, 12.8 and 5.4% from the rest of lower Odra, lower Warta and Noteć, respectively (Fig. 11).

Data on catches from the lower Odra, Warta and Noteć were also processed similarly to those from the Szczecin Firth to present monthly results (Fig. 12). The bulk of salmon and trout appeared to have been removed from the region off Stołczyn and Dąbie between April and October, somewhat later (July – November) from the lower Odra, and still later (September – October) from the rivers Warta and Noteć.

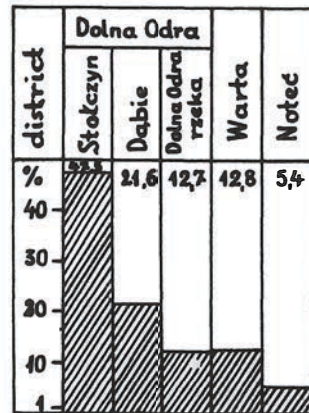


Fig. 11. Percentages of salmon and trout catches contributed by the particular regions of the Polish part of the lower Odra, Warta and Noteć over 1961–1972 (the sum/kg) of catches from 1961–1972 assumed as 100%

## STOCKING

Post-war data on salmon and trout stocking indicate that this was done only in the right-bank tributaries of the river Odra system, that is only in Poland (Table 3).

Young salmon were stocked only into the Drawa drainage area, the river being a third-order right-bank Odra tributary. The first post-war action took place in 1948, 40 000 individuals of salmon fry hatched from eggs obtained in autumn 1947 being liberated. Over the period examined the stocking was implemented almost each year. Taking into account the kind of stocking material, 3 characteristic periods can be distinguished. In the first period covering the years 1948–1956 only newly-hatched fry was used in stocking, while fry and fingerlings in the second (1957–1968) and fry and smolts in the third one

Table 3

## Salmon and trout stocking of the lower Odra system

Year	Salmon				Trout								
	Drawa				Świniec	Gowienica	Ina	mouth of Płonia	total	Ina	Świniec	Szczecin Firth	total
	in thousand individuals		individuals		in thousand individuals								
	newly hatched fry	autumn fingerlings	2 year old fish or smolts	kelts	newly hatched fry					autumn fingerlings	smolts		
1948	40.0												
1949	630.0												
1950	—												
1951	142.0												
1952	115.0												
1953	77.0												
1954	213.0												
1955	33.0												
1956	200.0												
1957	234.3	4.0											
1958	—	20.7								30.1			
1959	43.8	5.0	300							27.0			
1960	—	8.4	101			125.0	10.0		135.0				
1961	100.0	6.2	3116			60.0	—		60.0				
1962	336.7	0.8	38			55.0	—		55.0				
1963	201.0	1.5	—			85.0	0.9		85.9				
1964	56.0	1.3	2			22.0	70.0		92.0				
1965	—	2.4	—		67.8	56.1	—		123.9				
1966	198.9	0.2	—		45.0	95.0	41.4		181.4				
1967	—	—	—		—	70.0	35.6		105.6				
1968	25.2	1.1	2500	13	—	90.0	40.0		130.0		7.0		7.0
1969	60.6	—	—	14	40.0	110.0	60.0		210.0		10.0		10.0
1970	32.0	—	1300	13	31.2	100.0	108.0		239.2			1.6	1.6
1971	70.0	—	1500	11	60.0	100.0	80.0		240.0				
1972	40.0	—	1800	3	50.0	230.0	120.0	40.0	440.0				
Total:	2848.8	51.6	10657	54	294.0	1198.1	565.9	40.0	2098.0	57.1	17.0	1.6	18.6

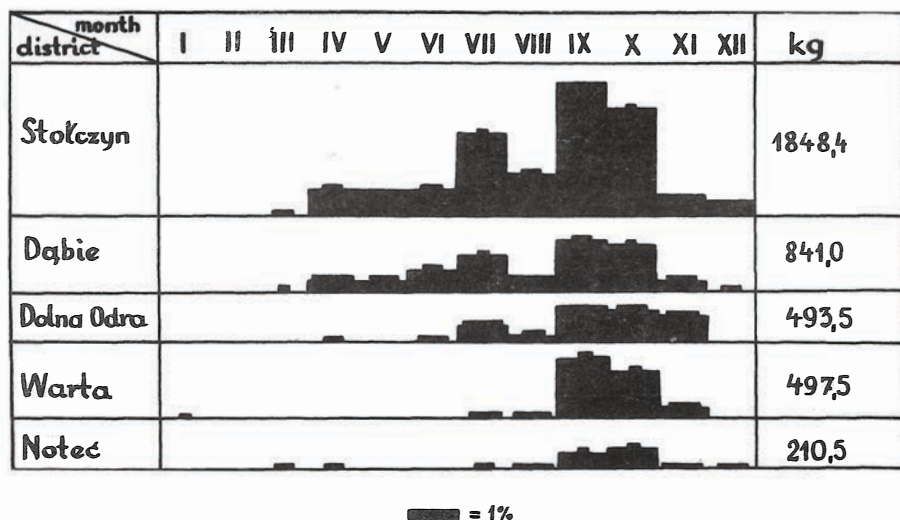


Fig. 12. Monthly and regional percentage composition of salmon and trout catches from the Polish part of the lower Odra, Warta and Noteć over 1961–1972 (the sum/kg) of catches from 1961–1972 assumed as 100%

(from 1968 up to now). Totally 2848.8 thousand individuals of fry, 51.6 thousand autumn fingerlings and 10 657 smolts were let into Drawa within 1948–1972. Apart from the young fishes, 54 salmon kelts, their maturity products having been taken out, were returned to Drawa.

Young trout were liberated to streams draining into the Szczecin Firth and lower Odra or directly to the Firth. Over the period of 1960–1972 Swiniec, Gowienica, Ina and Płonia obtained 2098 thousand individuals of newly hatched fry derived from spawners caught in the river Rega as well as those from eggs incubated in the hatchery in Goleniów. 57.1 thousand individuals of fingerlings stocked to Ina were derived from the Koszalin district hatcheries incubating eggs obtained from spawners caught presumably in the rivers Wieprza and Grabowa or Słupia. 18.6 thousand smolts let in Swiniec and the Szczecin Firth were obtained from the hatcheries in the Wrocław district and from the Rega trout spawners. Newly-hatched fry were planted in brooks, while fingerlings and smolts in bigger streams or directly in the Szczecin Firth near the mouth of Gowienica.

As it can be seen from the description presented, the amount of stocking in the lower Odra system after the World War II, and particularly from 1966 on tends to increase. Undoubtedly the development in this field is related to the size of the Rega trout spawning stock giving the reproductive material and to the fact of opening, in 1959, of hatchery in Goleniów.



## RECAPITULATION AND CONCLUSIONS

The annual catches of salmon and trout from the Szczecin Firth have been in the recent years clearly higher than these obtained before the war. In the years 1913, 1935 and 1938 the catches ranged within 0.1–0.5 t (Talarczyk, 1951), whilst the range of 1.3–3.16 t can be ascribed to the period of 1960–1972.

An annual mean catch of salmon and trout from the Szczecin Firth within 1960–1972 amounted to 2105 kg, while the value for the lower Odra, Warta and Noteć from 1961–1971 was 341.4 kg.

The equation of the regression line calculated shows the annual catch increment throughout the last 13 years (1960–1972) to be 100 kg in average.

In the Polish part of the Szczecin Firth the highest share (31.6%) was contributed by the region off Kamień Pomorski, i.e., the river Dziwna connecting the Firth with the sea; in the Polish part of the lower Odra as well as in Warta and Noteć the region off Stołczyn and Dąbie contributed the largest amount of 69.1%.

The ever-increasing stocking should influence the catches, so the relevant information should be collected and analyzed.

The materials presented show that stocking is implemented only by the Polish fishermen's organizations, while for the Szczecin Firth and lower Odra combined the German fishermen catch salmon and trout in amounts more or less the same as their Polish colleagues. Thus it seems worthwhile to draw the attention of GDR fishermen's organizations to the production of stocking material. It is for the both sides' benefit to undertake joint efforts in stocking this region with salmon and trout.

Also the uniform sizes and protection periods should be agreed upon to be implemented within both Polish and German parts of the lower Odra system.

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## POŁOWY ŁOSOSIA (*SALMO SALAR* L.) I TROCI (*SALMO TRUTTA* L.) W SYSTEMIE DOLNEJ ODRY ORAZ ZARYBIANIE

### Streszczenie

W pracy przedstawiono połowy łososia (*Salmo salar* L.) i troci (*Salmo trutta* L.) razem biorąc Zalewu Szczecińskiego, dolnej Odry, Warty i Noteci w latach 1952–1972. Ponadto zostały zgromadzone szczegóły zarybiania zlewni dolnej Odry łososiem i trocią w latach powojennych.

Połowy roczne łososia i troci Zalewu Szczecińskiego z lat 1960–1972 w porównaniu z danymi z lat 1913–1948 są wyraźnie wyższe i wykazują tendencję wzrostową. W roku 1913, 1935, 1938 łowiono między 0,1–0,5 tony (Talarczak, 1951), a w latach 1960–1972 między 1,3–3,16 tony.

Z zebranych danych wynika, że 2105 kg wyniósł średni połów roczny łososia i troci w latach 1960–1972 w Zalewie Szczecińskim i 341,4 kg w latach 1961–1972 w dolnej Odrze, Warcie i Noteci razem biorąc.

Z obliczonego równania prostej regresji wynika, że roczny przyrost wysokości połowów w systemie dolnej Odry w latach 1960–1972 wyniósł przeciętnie 100 kg.

W latach 1960–1972 ogólny połów wyniósł 11 525,9 kg (42,1%) z części polskiej i 15 843 kg (57,9%) z części niemieckiej Zalewu Szczecińskiego chociaż obszar jej jest o 6,4% mniejszy.

Nasi rybacy w ciągu 21 lat badań (1952–1972) wyłowili z dolnej Odry i j. Dąbie łącznie, więcej łososi i troci w stosunku do rybaków niemieckich. W tym okresie 3 437,4 kg (93,8%) wyłowili nasi

rybacy i 225,5 kg (6,2%) niemieccy. Rybacy polscy łowią na blisko 9-krotnie większym obszarze wodnym dolnej Odry.

Z opracowanych materiałów dla lat 1960–1972 odnoszących się do Zalewu Szczecińskiego wynika, że 91,4% połowu rocznego pozyskano w siedmiu kolejnych miesiącach kwiecień – październik. Natomiast znacznie mniej bo tylko 8,6% w pozostałych pięciu miesiącach roku listopad – marzec.

Procentowy udział połowów łososa i troci w dolnej Odrze oraz Warcie i Noteci w miesiącach przebiega nieco inaczej. Z opracowanych materiałów odnoszących się do połowów naszych rybaków za lata 1961–1972 wynika, że główny połów wynoszący 54,6% przypada na wrzesień – październik. Znacznie mniejszy połów wynoszący 29,9% przypada na lipiec – sierpień i listopad. Procentowy udział połowów w pozostałych siedmiu miesiącach styczeń–czerwiec i grudzień był niewielki i wyniósł 16,2%.

Z polskiej części Zalewu Szczecińskiego najwyższy połów wynoszący 31,6% przypadł na rejon Kamienia Pomorskiego tj. rzekę Dziwnę łączącą Zalew z morzem, natomiast z polskiej części dolnej Odry oraz Warty i Noteci najwyższy połów wynoszący 69,1% przypadł na rejon Stołeczyna i Dąbia stanowiących ujście Odry.

Z zebranych danych dotyczących przeprowadzonych zarybień młodzieżą łososa i troci wynika, że akcje takie były dokonywane po II wojnie światowej jedynie w prawobrzeżne dopływy systemu Odry, leżące na obszarze Polski. W okresie powojennym do 1972 r. wsiedlono ogółem 2 848,8 tys. sztuk wylęgu; 51,6 tys. sztuk narybku jesiennego, 10,657 tys. sztuk smoltów i 54 kelty łososa oraz 2 098,0 tys. sztuk wylęgu, 57,1 tys. sztuk narybku jesiennego oraz 18,6 tys. sztuk smoltów troci.

Wzrastające akcje zarybieniowe powinny oddziaływać na połowy, dlatego zachodzi potrzeba dalszego gromadzenia i analizowania informacji w tym zakresie\*.

### 3. Хелковски

#### ЛОВ ЛОСОСЯ (*SALMO SALAR* L.) И КУМЖИ (*SALMO TRUTTA* L.) В СИСТЕМЕ НИЖНЕЙ ОДРЫ И ЗАРЫБЛЕНИЕ

#### Р е з ю м е

В работе описан лов лосося (*Salmo salar* L.) и кумжи (*Salmo trutta* L.) в Щецинском заливе, нижней Одре, Варте и Нотеци в 1952–1972 гг. Кроме того, представлены данные, касающиеся зарыбления лососем и кумжей водосбора нижней Одры в послевоенные годы.

Годовой улов лосося и кумжи в Щецинском заливе за 1960–1972 гг. по сравнению с 1913–1948 гг. является намного большим и продолжает увеличиваться. В 1913, 1935 и 1938 гг. выдавливали от 0,1 до 0,5 т (Таларчак, 1951), а в 1960–1972 гг. – от 1,3 до 3,16 т.

Из собранного материала следует, что 2105 кг составил средний годовой улов лосося и кумжи в 1960–1972 гг. в Щецинском заливе и 34 1,4 кг в 1961–1972 гг. в нижней Одре, Варте и Нотеци вместе взятых.

\* Praca została wykonana z zasiłku elektrowni „Dolna Odra” przekazanego przez Instytut Meteorologii i Gospodarki Wodnej.



Из выведенного уравнения прямой регрессии следует, что годовое увеличение улова в системе нижней Одры в 1960–1972 гг. составило в среднем 100 кг.

В 1960–1972 гг. общий улов составил 11 525,9 кг (42,1%) в польской части Щецинского залива и 15 843,0 кг (57,9%) в немецкой части, хотя поверхность её на 6,4% меньше.

Польские рыбаки в течение 21 года исследований (1952–1972) выловили в нижней Одре и из оз. Домбе в общем больше лосося и кумжи, чем немецкие рыбаки. За этот период наши рыбаки выловили 3437,4 кг (93,8%), а немецкие – 225,5 кг (6,2%). Польские рыбаки лсвят на участие нижней Одры, почти в 9 раз большем.

Из исследуемых материалов за 1960–1972 гг., касающихся Щецинского залива, следует, что 91,4% годового улова получены в течение 7 месяцев, с апреля по октябрь. Значительно меньше (8,6%) рыбы выловлено в течение остальных 5 месяцев, с ноября по март.

Удельный вес лосося и кумжи в уловах, приходящихся на отдельные месяцы, в нижней Одре, Варте и Нотеци распределяется неравномерно. Материалы, относящиеся к лову наших рыбаков в 1961–1972 гг., свидетельствуют о том, что основной улов, составляющий 54,6%, приходится на сентябрь – октябрь. Значительно меньший улов, составляющий 29,9%, приходится на июль – август и ноябрь. Удельный вес улова в течение остальных семи месяцев был невелик и составлял 16,2%.

В польской части Щецинского залива наибольший улов, составляющий 31,6%, отмечался в районе Камея Поморского, в г. Дзивице соединяющей залив с морем. В польской части нижней Одры, Варте и Нотеци самый высокий улов, составляющий 69,1%, отмечался в районе Столчына и Домбе, т.е. в устье Одры.

Собранные материалы относительно зарыбления молодь лосося и кумжи свидетельствуют о том, что подобные мероприятия проводились после II мировой войны только в правобережных притоках бассейна Одры, расположенных на территории Польши. В послевоенный период, до 1972 г., посажено 2848,8 тыс. шт. мальков, 51,6 тыс. шт. осенней молоди, 10,657 тыс. шт. смолтов и 2098,0 тыс. шт. мальков, 57,1 тыс. шт. осенней молоди и 18,6 тыс. шт. смолтов кумжи.

Усиление мероприятий по зарыблению должно повлиять на уловы положительно, поэтому возникает необходимость продолжить начатые работы по сбору и анализу связанного с данной проблемой материала.

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