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PRELIMINARY RESULTS ON RESTORATION OF ATLANTIC SALMON (SALMO SALAR L.) IN POLAND

by

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Abstract (ie Salmo salar eel)

Salmon was present in many Polish rivers. Deterioration of envinronmental conditions and damming of rivers caused that salmon populations in Polish rivers have extincted and it became a protected inland water species. In 1985 and 1987 the annual import reached 50 000 salmon eyed eggs from Daugava spawners, and 10 000 Neva salmon eyed eggs from Finland. Daugava spawners were reared in net cages in the Gulf of Gdańsk. There were obtained 0,8-1 million eggs yearly. In 1995 these spawners were moved to the Fish Farm "Aquamar" to rear them in fresh water. In 1994 next 50 000 Dagava salmon eyed eggs were imported from Latvia. In 1994-1996 there were released 349 750 one and two-year-old salmons into the Drawa River, the Drwęca River and into 3 Pomeranian rivers. Tagging experiments were carried out and 24 856 tagged smolts were released into 5 rivers. From these tagged fish there were obtained 16 younger fish and 11 older ones. The older salmon were caught in the southern Baltic and in the Gulf of Finland and the Gulf of Bothnia. After the first year in the sea they reached 47 cm, after the second 83 cm and 5.9 kg.

1. Status of salmon in Poland

Salmon was present in many Polish rivers (Fig.1). The bigger salmon (Salmo salar L.) populations were in the Vistula River and the Drawa River (Bartel 1993a). Worsening of envinronmental conditions in many rivers and its damming caused that the numerical force of salmon population was dimishing. That tendency was even more pronounced after the II World War. The last salmon was reported to be caught in the Skawa River (a tributary of the upper Vistula River) in 1952 (Bieniarz and Łysak 1975), but in the lower Vistula River salmon were still caught. At the end of the 1960's, attempts to catch salmon spawners in the Vistula estuary were unsuccessful (Bartel 1993b). A similar decreasing tendency was observed in the Drawa salmon population. The last salmon spawners were observed on the Drawa spawning grounds in 1985 (Chełkowski 1986) and 2 years later attempts to catch Drawa spawners were unsuccesful (Chełkowski 1988). This resulted in the fact that salmon became a protected inland waters species.

2. Programme of salmon restoration in Poland

That finding was the main reason for taking certain measures leading to regeneration of salmon stock in Polish waters. It was decided that for restoration of salmon in Poland there should be used salmon population from river with natural salmon populations which is geographically closest to Polish rivers. For this purpose the Daugava salmon populations was used.

3. Rearing of salmon spawners

In 1985 and 1987 the Sea Fisheries Institute imported 50 000 Daugava salmon eyed eggs in each year. Smolts were reared in the Salmonid Research Laboratory of Inland Fisheries Institute at Rutki. These smolts were used for rearing spawners in net cages in the Gulf of Gdańsk. From these spawners about 0.8-1 million salmon eggs were collected yearly. In autumn 1995, after artificial spawning, salmon spawners at age 6+, 4+ and 3+ were moved to Fish Farm "Aquamar" in Miastko which has reared salmon spawners in fresh water.

In 1994 next 50 000 salmon eyed eggs, obtained from the Daugava spawners, were imported. Smolts were reared in the Fish Farm"Aquamar" and 1500 selected 2-year-old smolts are reared as breeders.

In 1985 the Inland Fisheries Institute obtained from Finland 10 000 Neva eyed salmon eggs.

4. Stocking

During the last few years, salmon alevins were stocked into the Słupia River and the Wieprza River. Number of released fish have not exceeded 50 000 alevins yearly. Results of these releasing were very low. Better results were obtained when salmon one summer old were released into small streams (Domagała and Bartel 1995).

Restoration programme of salmon in Poland is based on smolt releasing. Smolts were reared in 3 hatcheries (Fig.2).

Smolts were released into the Drwęca River (tributary of the Vistula River), the Drawa River (tributary of the Oder River) and into 3 Pomeranian rivers - Słupia, Wieprza and Parsęta (Fig.2). Into these above mentioned rivers there were released 349 750 fishes, among them there were 216 945 and 132 805 respectively one and two year old smolts . Majority of these fish were released into the Wieprza River (Tab.1, Fig.2).

Tagging experiments

In 1994-1996 there were released 24 856 tagged smolts, which were released into the Drwęca River and the Drawa River (tributaries of the Vistula River and the Oder River respectively) and into 3 Pomeranian rivers (Fig.2).

Smolts were tagged with Carlin tags. There were obtained only 27 recoveries, 16 from younger fish and 11 from older ones (Tab.2). The released smolts migrated down to the sea and they were caught in the coastal waters. Smolts released into the Drawa after 13 days were caught in the Lake Dąbie about 300 km from the site of release. These smolts migrated with an everage speed of 23 km per day. It was slower then the Drawa smolt released into the same place in 1970s when smolt migrated with speed of 70 km per day (Bartel 1987). The older tagged salmon were caught in the southern Baltic, the Gulf of Finland, and the Gulf of Bothnia (Fig.3).

Daugava salmon released into Polish rivers, after the first year in the sea reached length of 47 cm, after the second 83 cm and 5.9 kg, but at the same time there was caught a fish with length of 51 cm and weight 1100 g.

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References

Bartel R. 1987. Distribution, migrations and growth Drawa salmon (Salmo salar L.).J.Appl.Ichthyol. 3 (1987) 33-38

Bartel R. 1993a. Anadromous fishes in Poland. Bull Sea Fisheries Institute 1(128):3-15.

Bartel R. 1993b. Present status of salmo and sea trout in Poland. In:Norrgren L. (ed.) Report from the Uppsala workshop on reproduction disturbances in fish. 20-22 Oct.1993. Swedish Envinronmental Profection Agency. Report 4346.

Bieniarz K. and A.Łysak 1975. Oddziaływanie człowieka na środowisko wodne i ichtiofaunę w Polsce południowej. (Impact of man on water environmental and ichthyofauna in southern Poland) Gospodarka Rybna 27,1:6-9.

Chełkowski Z. 1986. Łosoś w Drawie XX. (Salmon in the Drawa River XX.) Gospodarka Rybna 38, 10:18-20.

Chełkowski Z. 1988. Łosoś w Drawie XXII. (Salmon in the Drawa River XXII). Gospodarka Rybna 40, 6:17-18.

Domagała J. and R.Bartel 1995. Survival of salmon (Salmo salar L.) fry stocked into small brooks. ICES Ana Cat Fish Comm. C.M.1995/M:36.

Wiktor J. 1989. Zarybianie Bałtyku łososiem w świetle polskich doświadczeń hodowli reproduktorów tych ryb w sadzach. (Stocking of the Baltic Sea with salmon in the light of Polish experience of rearing of salmon spawners in net cages.). Technika Gosp.Morska 7 (152). 317-319.

Table 1. Number of released smolts into Polish rivers in 1986-1996.

Year	River	Number of fish
1986	Słupia	840
1994	Wieprza	22647
1995	Wieprza	46687
	Drwęca	25019
	Drawa	22843
	Słupia	68678
	Parsęta	46254
Total		209481
1996	Wieprza	20422
	Grabow	15500
	Drwęca	13675
	Wel	6953
	Drawa	11403
	Słupia	24402
	Parsęta	24427
Total		116782
Grand Total		349750

Table 2. Tagging experiments of salmon smolts released into Polish rivers in 1994-1995

Year	River	Number of smolts	Age	Recoveries younger1/ fish	Recoveries older2/ fish
1994	Wieprza	1080	2	-	9
1995	Wieprza	2999	2	4	
	Wieprza	996	1		
	Drwęca	1997	2	1	
	Drawa	1999	2	-	1
	Słupia	1999	2	2	
	Parsęta	2000	2	2	1
	Parsęta	975	1		
	Gulf of Puck	990	1		
Total 1995		13955		9	2
1996	Wieprza	3000	2		
	Drwęca	3000	2	1	
	Drawa	990	2	3	
	Słupia	1900	2	1	
	Parsęta	931	2	2	
Total 1996		9821		7	
Grand Total		24856	16	11	

1 - fish caught before the end of June of the first year after the release

2 - fish caught after June of the first year after the release.

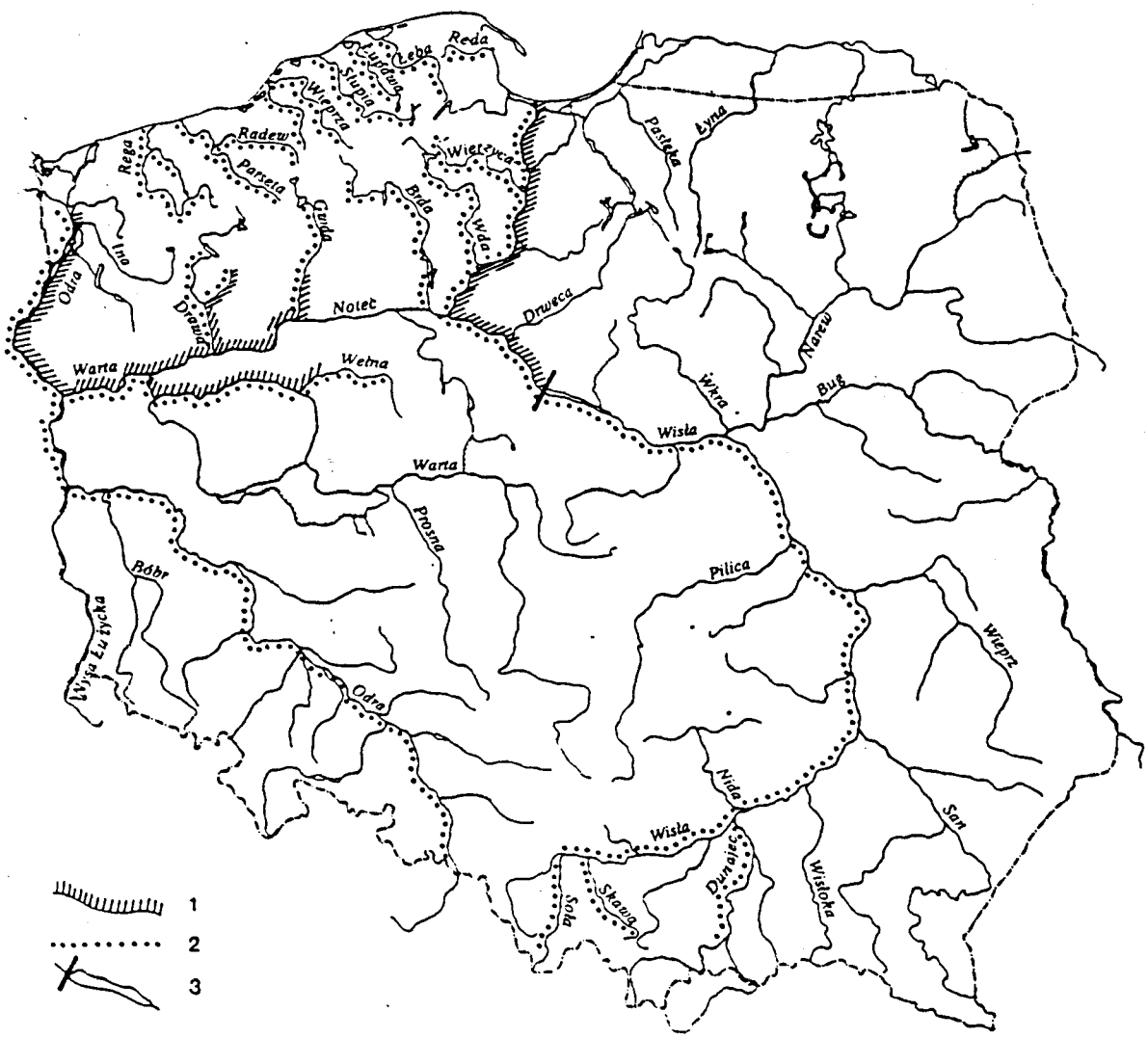

Figure 1, Salmon rivers in Poland.

1 - after the II World War

2 - in former times

3 - the dam built in 1968

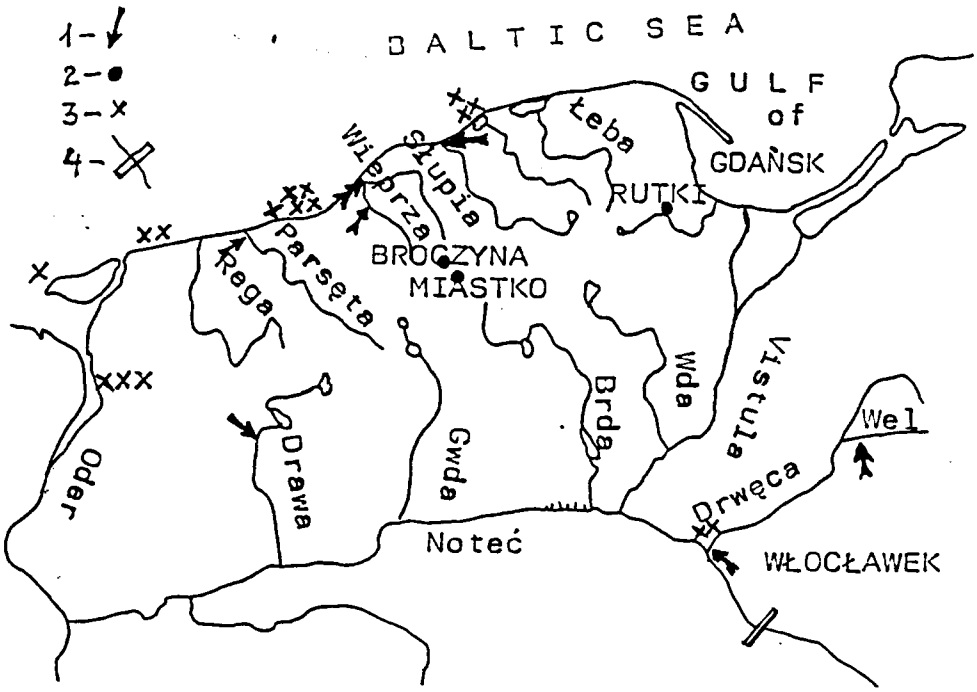

Figure 2 Sites of smolt release /1/, hatcheries in which salmon are reared /2/, site where one specimen was caught /3/, the dam built in 1968

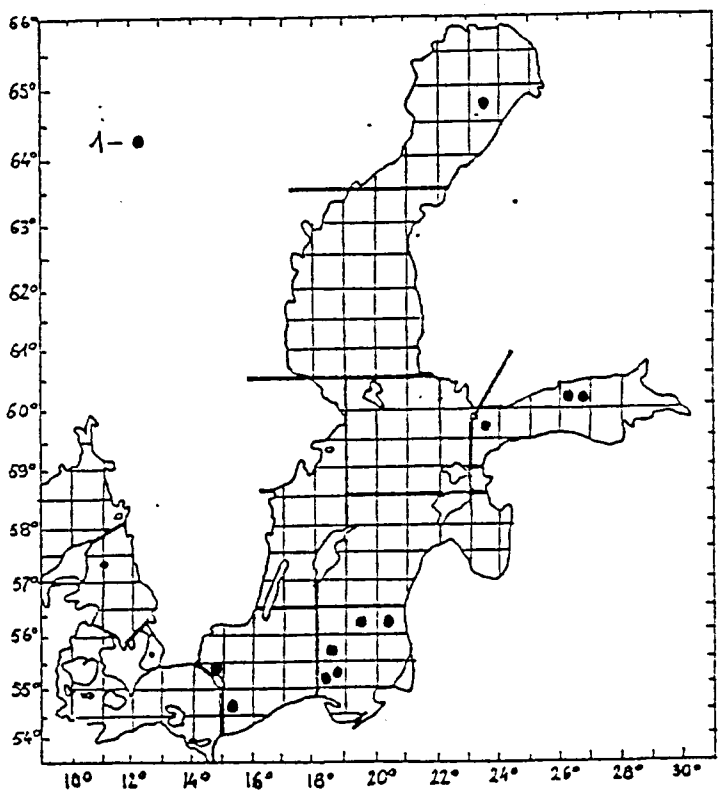

Figure 3. Sites of catches of tagged "older" Daugava salmon. 1 - site where one specimen was caught.