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Anadromous and Catadromous

Fish Committee

Ref. J

Stocking results of cultivated rainbow trout (Oncorhynchus mykiss) smolt in the Gulf of Finland

by

Ari Saura

Finnish Game and Fisheries Research Institute

P.O. Box 202 FIN-00151 Helsinki, Finland

ABSTRACT

In May 1992, a total of 1794 rainbow trout smolt were tagged with Carlin tags and released into the Gulf of Finland near Helsinki. For comparison, tagged salmon and sea trout smolt were released in the same area. The smolt were one-year-old females and of two size groups. The purpose of the stocking was to create variation in the salmon and sea trout fishery. The proportion recaptured after 24 months was 12.2% and the total mean catch was 269 kg/1000 released fish, which is much more than the results of simultaneous sea trout taggings in the same area. The mean weight during the second year was 2.7 kg; 45% of the fish were caught by Finnish fishermen and the rest by fishermen from other Baltic Sea countries. It seems likely that rainbow trout make very wide feeding migrations in the main basin of the Baltic. The final results will be available in 1995.

Introduction

The rainbow trout has been cultivated in Finland for direct consumption for about thirty years . Inland, it is cultivated along large water courses in fish-farm ponds and on the coast in net cages; fish escaped from the net cages have grown very quickly in the sea. "Put and take" angling has also become very popular during recent years. Fish of angling size have been released into small lakes, rivers, and even to the sea. Stocking with smolt-size rainbow trout has been rare and unsuccessful.

Tagging and stocking

On May 15, 1992, a total of 1794 Carlin-tagged rainbow trout smolt were released into the Gulf of Finland about 15 km west of Helsinki, in the Espoo archipelago. The smolt were one-year-old females cultivated in central Finland for commercial food fish production, tagged one week before release and transported to the sea in a tank truck .There were two size groups with mean lengths of 235 and 248 mm. Tagged salmon and sea trout smolt were simultaneously released in the same area (Table 1).

Table 1. Number and mean size of tagged rainbow trout, salmon, and sea trout.

	Number	Mean length mm	Mean weight g
Rainbow trout			
smaller	897	235	161
larger	897	284	286
Salmon	999	203	99
Sea trout	997	237	140

Results

The mean proportion of rainbow trout recaptured after 24 months was 12.2% and the total catch 269 kg/1000 released fish, which is the same level as that of salmon and much greater than that of sea trout (Table 2). During the first year the smaller smolt produced a catch of 33 kg/1000 released fish more than did the larger smolt.The reason may be that gill net fishing for pikeperch in the archipelago preferentially captures larger smolt during the first year in the sea. The smaller fish

are better able to escape through the gill nets toward the offshore areas, where the growth rate is faster and much of the catch is taken with drift nets (Fig. 1). During the first year after release the rainbow trout catch was larger than that of salmon or sea trout; the mean size was larger, too.

The mean weight of rainbow trout during the second year was 2.6 kg, which was more than that of sea trout but less than that of salmon. The size of the fish varied widely (Table 2 and Fig. 2). Of these fish 45% were caught by Finnish fishermen, 38% by Danish fishermen and the rest by fishermen from other Baltic Sea countries (Sweden, Germany, Poland, Estonia, and Latvia; Fig.3).

Rainbow trout seem to migrate very quickly toward the south. Most recaptures were made in offshore areas of the Gulf of Finland and Baltic main basin (Fig. 4).

Table 2. Results of rainbow trout smolt tagging experiment compared with respective tagging of salmon and sea trout during 24 months after release.

	First year		Second year		Total	Catch/	Proportion
	% of return	mean weight kg	% of return	mean weight kg	% of return	1 000 released kg	returned (%) by Finnish fishermen
Rainbow trout							
smaller	3.2	1.6	9.3	2.5	12.5	285	45.3
larger	4.9	1.2	6.9	2.8	11.8	252	45.4
Salmon	1.0	1.2	6.2	3.7	7.2	244	90.7
Sea trout	1.0	0.7	1.3	2.1	2.3	34	96.2

Discussion

It seems likely that rainbow trout make very wide feeding migrations in the main basin of the Baltic, as about 47% of the recaptures were made in the Gulf of Finland and almost all others in the main Baltic basin. The profit for Finnish fishermen is less than from salmon and sea trout; only 5-15 % of the recaptures of these species were made outside the Gulf of Finland. According to Bartel (1985 a), rainbow trout tagged in Poland migrated throughout the Baltic, but most were caught in Polish coastal waters. Of the rainbow trout released into the Oslofjord and River Ims in Norway, 88% and 69%, respectively, were taken at a distance <50 km from the release sites (Jonsson et al. 1993).

According to the results, 24% of the smaller and 41% of the larger rainbow trout were caught during the first year after release. On the Norwegian coast, 70 - 80% of the rainbow trout recaptures were taken in the year of release (Jonsson et al. 1993).

The rainbow trout seems to be a very useful fish species for sea ranching. Production of all-female groups is easy and the smolt are cheaper to produce than salmon or sea trout smolt. The females grow more quickly and the quality of the meat is better than that of males.The return percentage and the catch/1000 released fish seem to be at a high level. In Poland, stocking with rainbow trout smolt in the Baltic is economically profitable (Bartel 1985 b). The weakness in Finland is that the local profit is not as good as with salmon and sea trout, which do not migrate in as wide an area. Protection of the natural salmon stocks in the Baltic may also become a problem for rainbow trout fishing, because both species are caught simultaneously with the same fishing gear in one area.

References

Bartel, R. 1985 a. Distribution and migrations of tagged rainbow trout (*Salmo Gairdneri* **Rich.**) released to the Baltic sea . Acta Ichthyologica et piscatoria. Vol. XV Fasc. Suppl. Szczecin.

Bartel, R. 1985 b. Effectiveness of stocking tagged rainbow trout (*Salmo Gairdneri* **Rich.**) into the Baltic sea.

Jonsson, N., Jonsson, B., Hansen, L. P. and Aass, P. 1993. Coastal movement and growth of domesticated rainbow trout (*Oncorhynchus mykiss* (Walbaum)) in Norway. Ecology of Freshwater Fish 2: 152-159. Denmark.

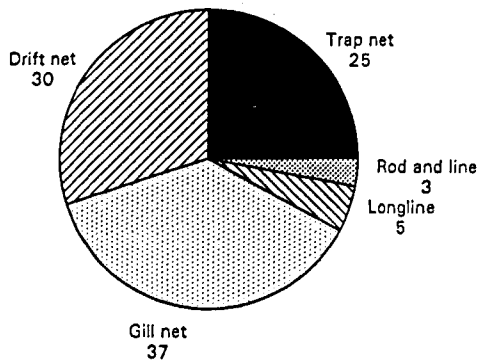
Legends to the figures

Figure 1. Percentages of recaptures by fishing gear for rainbow trout. (A) smaller and (B) larger smolt, (C) salmon and (D) sea trout during 24 months after release.

Figure 2. Weights (g) of recaptured fish during 24 months after release. (A) smaller and (B) larger rainbow trout smolt, (C) salmon and (D) sea trout.

Figure 3. Cumulative rainbow trout recaptures in numbers by country during 24 months after release.

Figure 4. Sites of release and recapture of rainbow trout in Baltic.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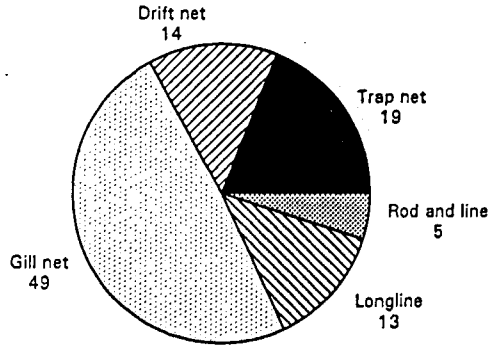
Trap net
25
Rod and line
3
Longline
5
Gill net
37

A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Trap net
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Rod and line
5
Gill net
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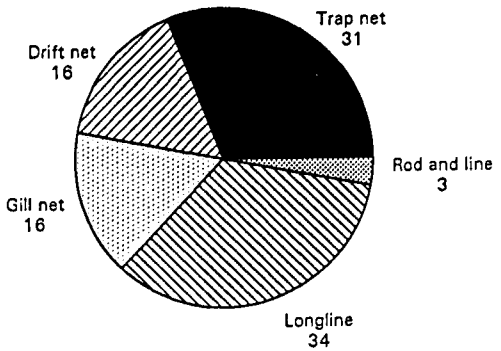
Longline
13

B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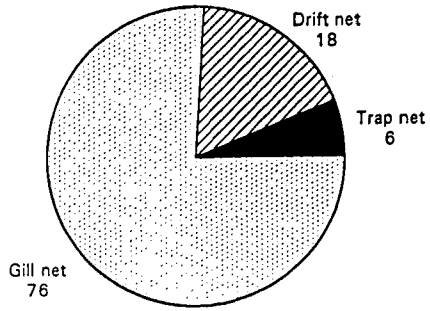
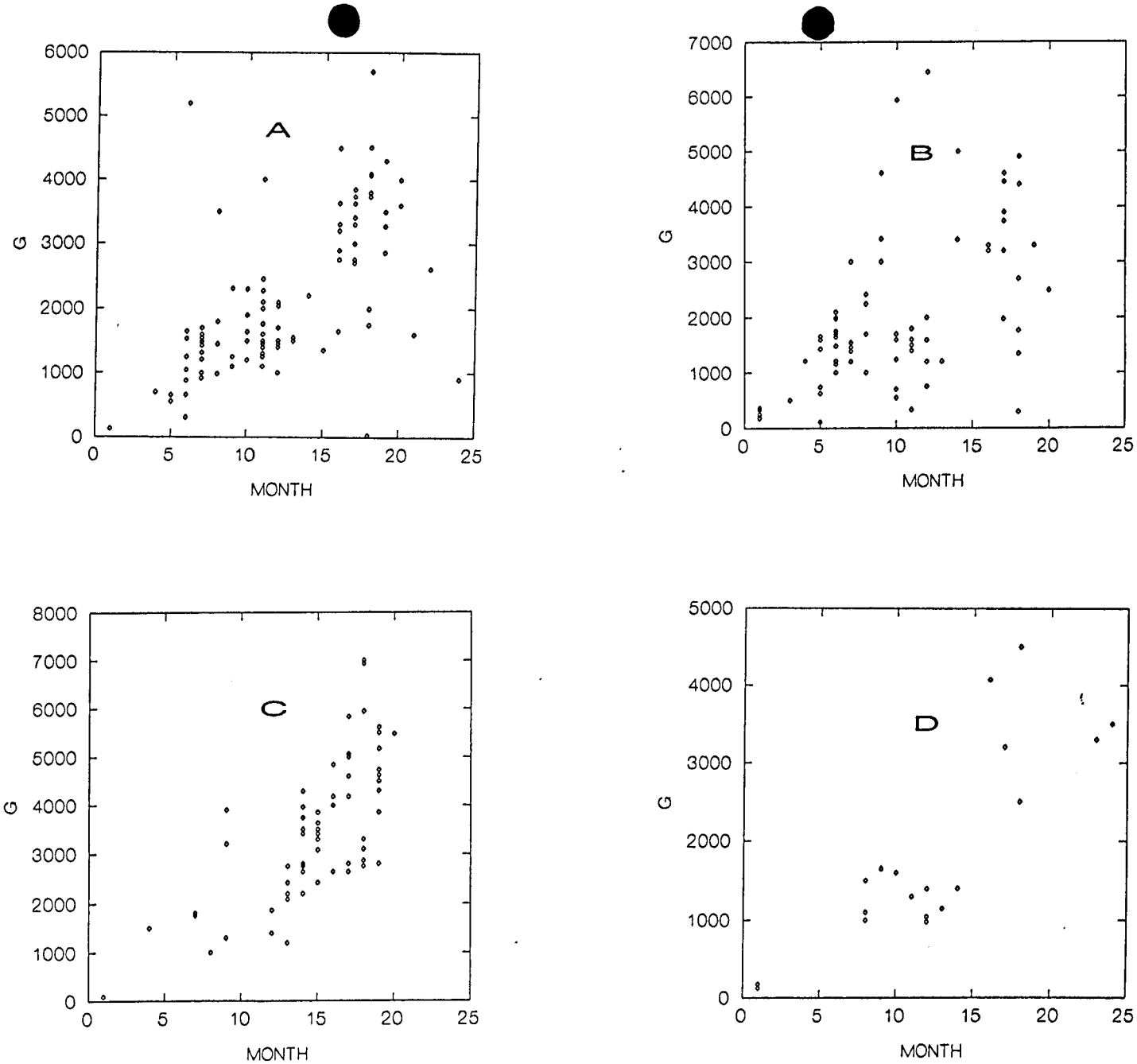
Trap net
31
Rod and line
3
Gill net
16
Longline
34

C


Drift net
18
Trap net
6
Gill net
76

D

Fig 1.


A
B
C
D
G
MONTH
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2000
3000
4000
5000
6000
7000
8000
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15
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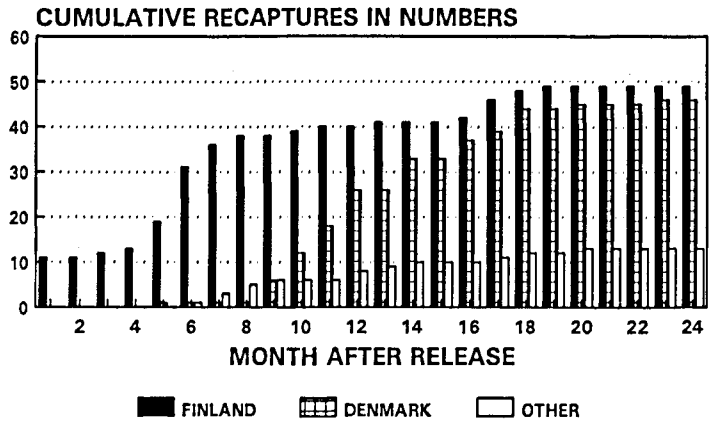
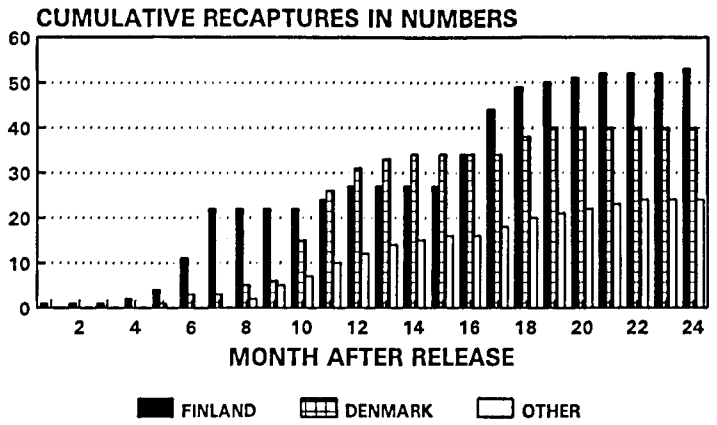
25

Fig 2.



OTHER: Estonia, Latvia, Poland, Sweden, Germany

large smolt



OTHER: Estonia, Latvia, Poland, Sweden, Germany

small smolt

Fig 3.

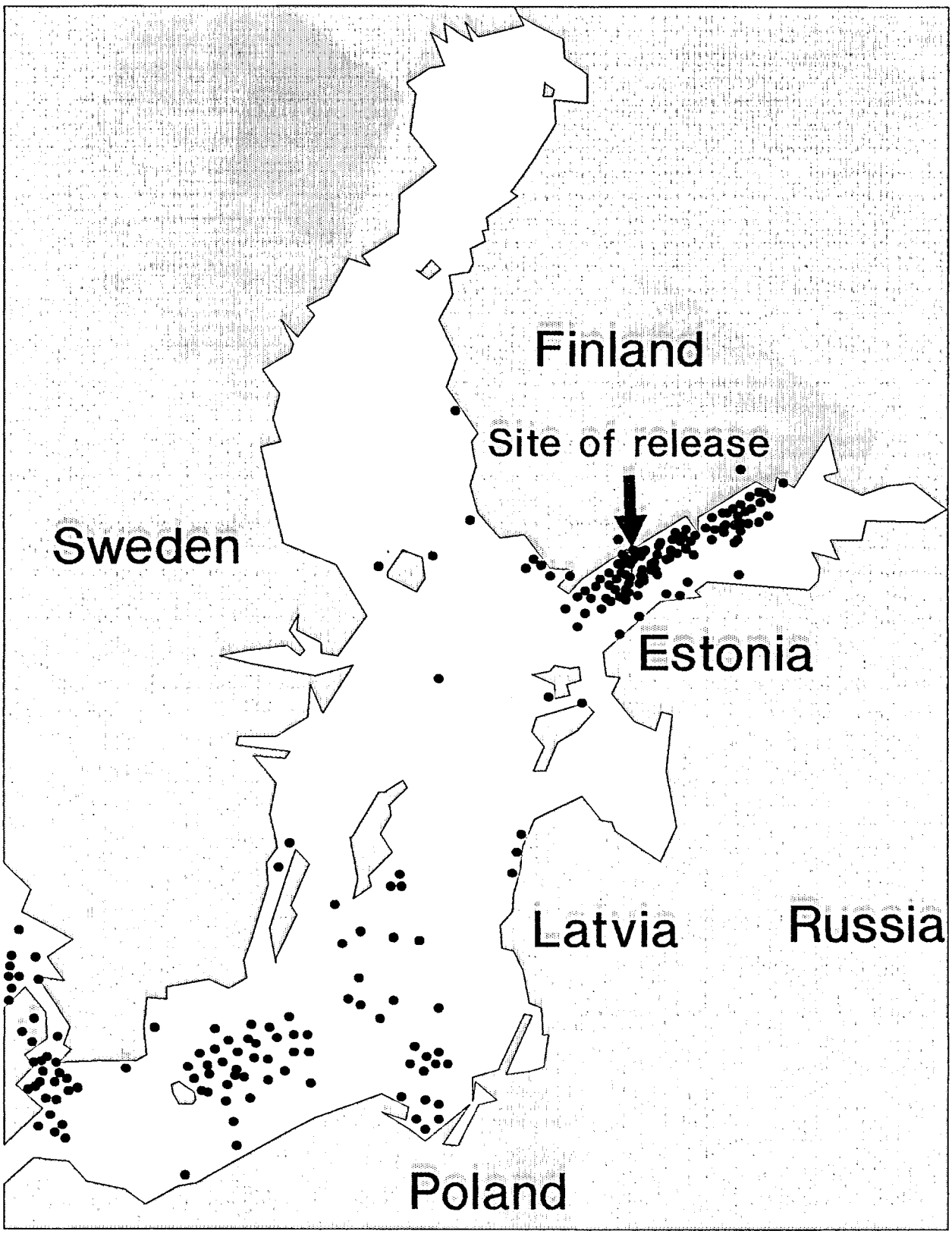

Finland
Site of release
Sweden
Estonia
Latvia
Russia
Poland

Fig 4.