

DCF Poland - Sampling plan description
Diadromous species data collection in freshwater

Region: **Inland waters**

Data source: **Recreational fisheries targeting Diadromous species**

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Introduction

Sea trout is an important angling target in the rivers of northern Poland. The majority of rivers in this region are used by the Polish Angling Association (PAA). At present, the only source of information on the level of angling catches is the catch record kept by individual districts. Unfortunately, the data obtained from the records is incomplete. This is due to the different level of retrieval of records by a particular district, the lack of information on the catches of guest anglers, and the problem of the reliability of the data entered in the records (overestimation and underestimation). The comparison of the level of angler's catches on the basis of the records, with the analysis of river catches for reproductive purposes and migration routes observed on automatic counters, indicates that the information collected in the records can be applied.

Methodology

Four rivers of varying size, the Słupia, Rega, Ina and Parsęta, where research had been conducted in previous years, and three new rivers, the Łeba, Reda and Drwęca, were selected for the monitoring. In all surveyed rivers sea trout is the main target for angling in its range of distribution. The closed season for sea trout is from 1 October to 31 December. In Poland, in the past, sea trout angling was oriented mainly towards fishing for kelts, i.e. post-spawning fish, during winter and spring (January-March). Currently, due to the high mortality of kelts associated with the presence of UDN disease, the months of increased pressure are late June/early July and September. The methodology for estimating angling catches is based on the following elements:

1. Face-to-face surveys over water *on site*.
2. Analysis of catch records, from PAA districts and other users on selected rivers.
3. Compiling migration data from counters in the Słupia and Parsęta rivers and cross-referencing them with catch records and survey results, as well as in-river catches of spawners collected by river tenants.

Examination of relationships between methods

Within this task, data collected during the project were compiled and an attempt was made to calculate the interrelationships between data such as the number of trout from counters, PAA fishing records and catches for reproductive purposes. Data from the Słupia river were used for the calculations due to the longest data series (2006-2019) and the fact that Vaki counters have been operating on this river since 2006. Equations obtained in 2018 and 2019

have been updated with data collected in 2020. First, Pearson's r correlation coefficients were calculated for net migrations from counters and results from the PAA catch records, as well as net migration from counters and catches for reproductive purposes. The regression equations for these relationships were then derived.

For the comparison of the variables count vs. catch records, despite the rather large scatter in the data, the correlation coefficient equalled 0.6 and was significant $p=0.02$ with $r^2=0.39$ (Figure 8). Importantly, the significance of the equation increases as the data series lengthens. For the correlation counter vs. catches for reproductive purposes Pearson's r equalled 0.7 and also the result was significant $p=0.01$ with $r^2=0.35$ (Figure 9).

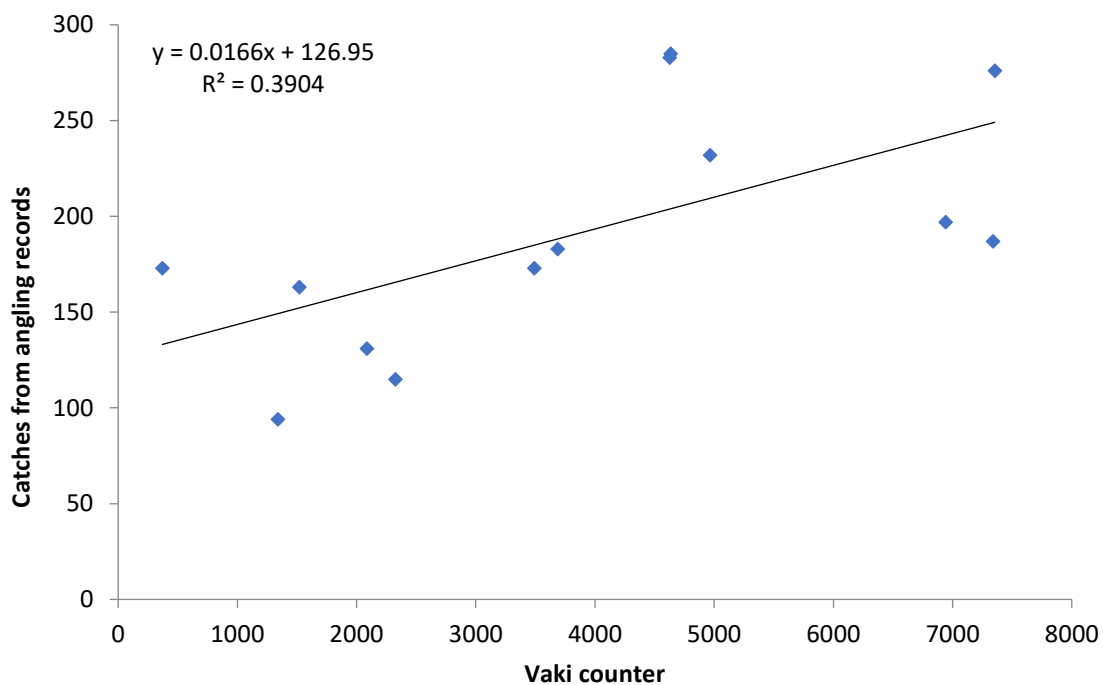


Figure 8. Regression plot for the relationship between counter data and catch records

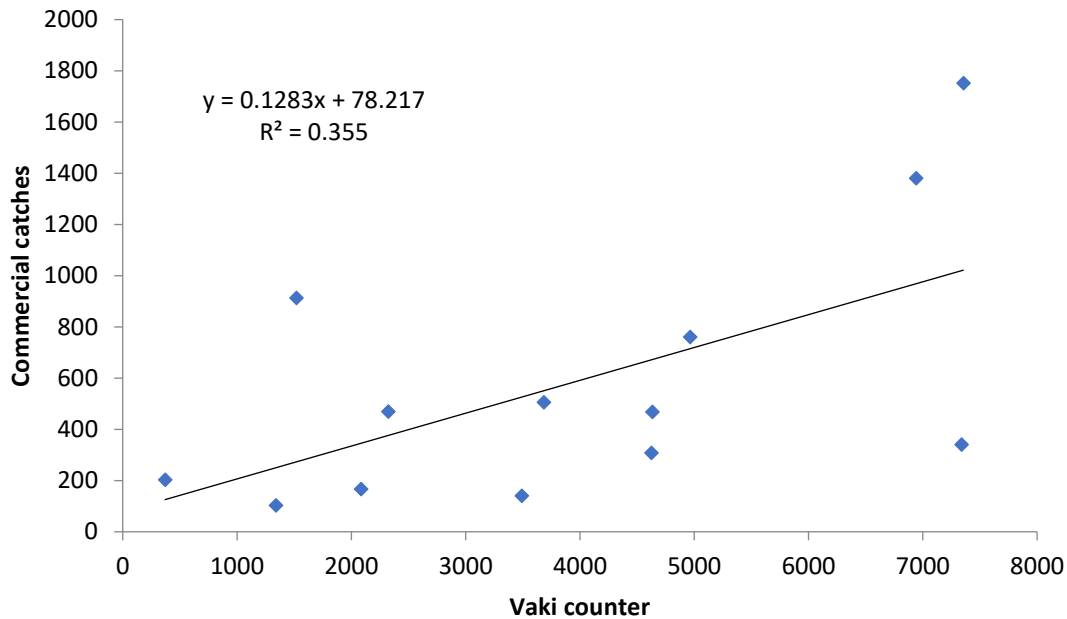


Figure 9. Regression plot for the relationship between counter data and catches for reproductive purposes for the Slupia river

Thanks to the equations obtained, it is possible to estimate individual variables, e.g. the number of trout caught (reported) on the basis of the scale of migrations from counters or user catches and vice versa. Extending the data series into further years should make the equations even more precise. The fact that the results are statistically significant lends credibility to data from angling records as well as from the catch sites.

Estimation of catch volumes

The results of the pilot programme indicate that, at present, the best source of data for estimating angler catch levels is catch records. However, these data need to be completed with information obtained from *on-site* surveys (Appendix 1). With the information collected during the four years of the survey, it is possible to try to make a calculation of the volume of catches based on the catch records and data collected during the pilot programme. For this purpose, the following formula is applied:

$$L_{ZT} = (a * 100 / b) * c$$

L_{ZT} = the number of sea trout caught

a = number of sea trout reported in the angling records

b = % of returns of angling records in a given year

c = participation rate of guest anglers derived from *on-site* surveys

The mean value of 50% for all rivers was taken as the percentage of returns of records, and the share of guest anglers as 10%, as this is the average obtained during the survey. The exception is the Parsęta river where, due to the permit collection system, the return percentage is higher and amounts to 80%, and this was used for the calculations. The converted values are shown in Table 1. **The data obtained in this manner indicate that in 2018, 2,330 sea trout individuals were caught in the seven rivers analysed, which, assuming the mean sea trout weight of 3 kg, gives about 7 tonnes.**

Table 1. Number of sea trout caught by anglers based on the catch records and calculated according to the proposed formula

Year	Słupia	Rega	Ina	Parsęta	Łeba	Reda	Drwęca
2018	359	464	240	700	48	341	178
2017	381	519	365	824	227		187
2016	207	341	777		191		365
2015	288	579	880		114		403
2014	253	592	539		106		187
2013	411	983	686		548		350

Further work and conclusions

In the course of the project it was possible to conduct surveys on seven sea trout rivers, and at the same time on all the important ones, where the system of recording angling catches is performed. The two other sea trout rivers where catch levels are significant for summary statistics are the Wieprza and Wierzyca rivers. Unfortunately, on both rivers, fishing users do not keep records of catches. Apart from these, the Radew river, a right-bank tributary of the Parsęta river, used by the PAA Koszalin District, should also be added to the counting system. The Łupawa River may also be of growing importance in the near future, especially after the fish ladder in Smółdzino has come into operation in 2020 and the area available for sea trout has increased. In this case, the user is the PAA Słupsk District, so the records of catches are kept. Adding this information to the data would allow for more accurate estimation of catches, which according to our estimates would increase from the level currently calculated by around 20% more. Considering this fact, in future years it would be advisable to focus on the analysis of data from the catch records, including those from previous years with the addition of missing rivers. In the current situation, it may be considered to suspend the *on-site* surveys for a period of one or two seasons.

Appendix 1: Survey template.

Angling survey no.

Concerning amateur sea trout and salmon fishing in the river

Your name and surname:

Site:

Date:

1. What voivodeship are you from?
.....
2. Are you a member of the Polish Angling Association? If yes, what district?

NO/YES what district?.....
3. Do you belong to any other angling association (enthusiasts' associations etc.)?

NO/YES
4. How many days a year do you spend angling (applies to all fish)?
0-10 11-25 26-50 over 50 days
5. How many days on this particular river (refers to sea trout and salmon catches)?
.....
6. How many hours do you usually spend angling during one trip?
0-2 3-5 over 5
7. What is your favourite angling method (for sea trout and salmon catches)?
Spinning/ fly/.....
8. When do you spend most time on the river?

January-March	April-June	July-September
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9. How many sea trout have you caught in the last 2 years?
in 2016indiv.; in 2017 indiv.
10. What size are the sea trout usually caught?
35-50 cm, 51-60 cm, 61-70 cm, 71-80 cm, over 81 cm
11. Have you ever lost a fish while hauling? If yes, how many times?
in 2016 indiv.; in 2017 indiv.
12. Do you take all the sea trout you catch?
NO/YES
13. What other species have you managed to catch in this river?
River trout/ rainbow trout/ grayling/ ide/ chub/ asp/ bream/ roach/ other (what):
14. What are your favourite fishing sites (section of river)?
.....
15. Have you ever caught Atlantic salmon in this river? If so how many, when?
NO/YES indiv.
16. Your email address (optional):