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Methods Used For Estimating The Unreported Catch In The Russian Federation

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Unreported fishing for Atlantic salmon in Russian rivers has, apparently, existed to a varying extent since after the ownership for rivers, their parts and sea netting stations was introduced, with proprietors having exclusive fishing rights in areas they owned. However, first references in the literature relating to undeclared catch of Atlantic salmon in Russia do not date further back than the beginning of the 20th century (Soldatov, 1903). The first estimation was undertaken by A.G.Smirnov (1935) in the 1930s, who estimated unreported catch in rivers and coastal areas of the Kola Peninsula as 20-25% of the catch landed at factories.

Thereafter attempts were made repeatedly to estimate the undeclared catch. For instance, according to the estimate by R.V.Kazakov (1983) illegal catch of salmon in northwest Russia was as high as 50%, and even 100% sometimes. For the Pechora river the level of illegal catch was estimated at 30-50% (Martynov, Zakharov, 1990). According to A.V.Zubchenko (Zubchenko, 1994) the illegal catch in the Tuloma river system was 25% in 1992 and about 50% in 1991. For the Kola river the figure was 25-33% in 1991-1993 (Zubchenko et al., 1995). For the Umba river the level of illegal catch was estimated at 26% (Zubchenko, Kuzmin, 1994).

Undeclared catch in Russia is mainly illegal catch. Besides, a new practice developed in the second half of the 20th century of suppressing information on catch, which was used for tackling local problems, such as paying for various services. Suppression of information on catches is also one of the ways to reduce taxes. There is also illegal retention of some of the catch for local sale and consumption at sea and in-river netting stations, landing stations etc.

As it is quite difficult to reliably quantify the undeclared catch, in most cases guess-estimation was applied and only in some instances indirect methods were used.

For example, V.G.Martynov and A.B.Zakharov (1990) estimated the losses due to illegal fishing on the Pechora river on the basis of anonymous questionnaire surveys, predominantly, in rural communities (of 5670 questionnaires distributed 1820 were returned, which made up 32%). Anonymous questionnaire surveying is as before applied on the Pechora river. A.V.Zubchenko and O.G.Kuzmin (1994) used catch statistics and reports from enforcement activities for estimating the illegal catch on the Umba river. To evaluate the pressure from illegal fishing on salmon stocks on rivers Kola and Tuloma a comparison of actual parr densities and estimated densities was undertaken (Zubchenko, 1994; Zubchenko rt al.; 1995).

In recent years following recommendations of the ICES North Atlantic Salmon Working Group the impact of legal and illegal undeclared catch on Atlantic salmon stocks in Russian rivers is estimated for each type of fishery separately - coastal fisheries, in-river net fishery, in-river rod fishery. The following methods of estimating the unreported catch are applied:

For legal coastal fisheries the estimate is based on the knowledge of local fisheries, predicted catch, logbook data, catch statistics for the current year and a number of years before and catch per unit effort data from different netting stations.

Legal in-river net fishery is now conducted in the Archangelsk region only. The estimate of legal undeclared catch is based on the comparison of catch per unit effort at a monitored site with an average catch per unit effort at all other sites.

For legal in-river rod fishery the estimate is derived on the basis of comparison of catch statistics from fishing by local anglers with catch statistics from foreign anglers, which is more accurate.

Estimate of illegal catch in coastal fishery, in-river rod fishery and poaching is based on the local knowledge of fisheries. On some rivers the estimate is derived through anonymous questionnaire surveys among local people.

In addition to anonymous questionnaire surveys a mathematical simulation model was used for estimating the illegal catch on one of the rivers, the Umba, the White Sea basin (Alekseev et al., 2006). The model includes functional sections, which describe the recruitment, natural mortality of salmon as fry and post-smolt and in the period of feeding migrations in the sea, fishing mortality, maturation and spawning stock.

For estimating the illegal catch of salmon on the river Umba at present, a simulation run was carried out. Since a part of the spawning stock was exploited legally by the hatchery, in catch-and retain and catch-and-release fisheries and in coastal fishery at netting stations a constant mortality was used in the model for the above types of fishery. This mortality arose as a result of non-selective fishery over the whole period of salmon run and the uptake in this case was estimated at 20-30% of the returns to the river. The rest of the catch fell into the category of illegal catch. The mortality rate from selective fishing targeting, mainly, the autumn run salmon was chosen such that the average contemporary stock abundance in the model was 2500-2700 fish, in other words, was corresponding to the level observed in recent years. It was found out that the simulated population stabilized at the above level, when the uptake constituted, approximately, 67-73% of the autumn run. These findings correspond quite well to the actual situation observed on this river and are comparable with data for salmon populations in other rivers.

In conclusion, it should be noted that despite all efforts to develop effective methods for estimating the unreported catch, estimations have not so far been very accurate, with estimates relying mainly on the local knowledge of fisheries, data from logbooks and catch statistics.

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