Fisheries on the southeastern coast of the Gulf of Finland and the adjoining river basins, 15th-18th centuries

Alexei Kraikovski, Julia Lajus and Dmitry Lajus

Introduction

Map. The Gulf of Finland, Neva River, and Ladoga Lake region.

The Northwest of Russia including the southern coast of the Gulf of Finland with the numerous rivers flowing into the sea, the Neva River basin, Ladoga and Chudskoe (Peipsi) lakes provides many opportunities for fisheries. The Atlantic sturgeon, Atlantic salmon, trout, the Baltic herring and other valuable commercial fish species have been caught in these waters through the ages. However, the history of fisheries in the Eastern Baltic has not yet been studied. This paper is the first attempt to outline the directions of research, to understand the state of fisheries in different centuries and the main trends of their development.

Finnish tribes known later as Izhora settled the territory of the Neva River basin and the southern coast of the Gulf of Finland in the first millennium
AD. The Slavs appeared in this region not later than in the tenth century. Since early times fisheries were very important for the local inhabitants, although agriculture was their main economic activity.

Since the early Middle Ages the territory of the present St. Petersburg region was part of the possessions of the Great Novgorod. The territory of the Novgorod Republic was divided into five parts called Piatina (one fifth). Each Piatina consisted of districts called Uezd. The territory under study belonged to Vodskaiia and Shelonskaia Piatina.

In the late fifteenth century the Great Novgorod was included in the united Russian State, but the administrative division of the territory remained the same. In the late sixteenth century the Russian State entered a terrible economic crisis and during the subsequent Time of Troubles in the early seventeenth century the whole coastal zone of the Eastern Baltic was occupied by Sweden and became part of the Ingermanland province. In this period numerous settlers came to this territory from Finland. The town Nyenskans in the Neva downstream became an important trade and economic center of the Eastern Ingermanland.

In the early eighteenth century, during the Great Northern war, the area was re-conquered by Russia. St. Petersburg was founded on the islands in the Neva River estuary in May 1703. Since that moment throughout the eighteenth and the nineteenth centuries the area under study was part of the St. Petersburg Governance. The big imperial capital became a very influential factor for the economy of the area, including fisheries.

Thus we can divide the history of the Russian Baltic into five periods. The first one started with the invasion of the Finnish tribes and ended in the ninth–tenth century, when this territory became part of the Old Russia. The second, the Novgorod period ended in 1475 with the joining of the Novgorod Republic to the Moscow State. In the early seventeenth century the Swedish period started, and in the early eighteenth century it was ended with the beginning of Russian imperial governance.

Our studies are based on cadastres and cadastre-like documents, which keep diverse information for the period from the late fifteenth up to the nineteenth centuries. Additional information was derived from all possible

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2 Ibid. P. 17.
7 Ibid.
8 Some of these cadastres were published in the 19th c. The most important one for us is the scribe book for Vodskaiia piatina (province) completed in the early 16th c. In this document
sources including accounting and statistical documents, an eighteenth century newspaper, and nineteenth century descriptions of fish and fisheries in the region. The following archives were examined: the Russian State Archives of the Ancient Documents (RGADA), the Central Historical Archives of St. Petersburg (CGIA SPb), the St. Petersburg Branch of the Archives of the Russian Academy of Sciences (PFA RAN).

The main problem with collecting data on the Baltic fisheries is their atomized character in comparison with some other regions of Russia, for instance, the fisheries in North Russia (White and Barents sea basins), which we collected and analyzed in 2001–2005 within the framework of the international program History of Marine Animal Populations (HMAP). We also encountered difficulties in attributing the data to the certain locations due to frequent changes of names of settlements during the period under study. To facilitate data analysis GIS techniques were applied. Tables, which include fishing places, catch compositions, sometimes the level of catches and number of fishermen, are organized in the database. The database is connected with an electronic map, forming the GIS, which reflects the spatial distribution of fisheries in the area under study in different time.

The comparative data with the previous description is included. This book was published partly in Novgorodskie pismovye knigi. Vol. 3. St. Petersburg. 1868 (later – NPK) and in Vremennik Obschestva Istorii i Drevnosti Rossiskikh. Vol. 11. St. Petersburg. 1851 (later – VOIDR).

10 The newspaper Sankt-Peterburgskie vedomosti was issued twice a week in the 18th c. It published diverse materials about fisheries along with all other materials on the economic life of the city of St. Petersburg and its environs.


This GIS is based on a digitized topographical model that was made of four different modern maps of the region on a scale of 1:50 000. We used images for digitizing different themes, which include three types of objects: lines, points and polygons. Lines include the following geographic objects: rivers and channels, shore line of the Baltic Sea and lakes, isobaths. Point objects include the basin of the Baltic Sea, lakes, major rivers and river mouths, which are shown in the scale of the map. On this digitized modern map we put the historical map of the 19th c. - Topographical map of St. Petersburg Governance made by lieutenant-general Schubert in 1840. From this historical map we have taken and digitized the settlements. In a special linear theme we marked the parts of the sea shore and rivers, where fisheries are mentioned in the documents or on historical maps and plans. Objects of this theme are linked through the ID field with the database. This will allow users to make requests from the database to the map and vice versa. GIS is created in ArcView 3.2 package and organized as a special project in this program. This allows us to make all the data commensurable and to start to analyze the spatial distribution of fisheries and the dynamic of the species composition of catches. The development of GIS has more potential with the increasing of the amount of our data in the future.

We paid special attention to interpretation of fish names, especially in early sources because local names sometimes were different in different parts of Russia and changed through time. Catch sizes were in most cases estimated based on taxes. The payments from the fishing grounds were most often collected in kind. The taxes probably corresponded with the tithe, the most common tax for the fisheries in the sixteenth – seventeenth centuries in Russia. We believe that fish species used for taxation were fished in the same location. Actual catches were calculated as taxes multiplied by ten.

This paper consists of three case studies. The sources allow us to study general features and most important trends in the development of fisheries in the area around fortress of Koporye, in the area of the Luga River and its basin and along the right (Russian) bank of the Narova River. Results of our studies of fisheries in the Neva River form a separate paper.

Fisheries in the Koporye area

The Koporye area is situated in the southeastern part of the Gulf of Finland and includes the coasts of Koporye Bay and basins of the small rivers flowing into this bay such as Sista and Kovashi, and also several of the right tributaries of the Luga River. The fortress of Koporye, which gave the name


14 See Lajus J. et al., 2001
to the bay, was founded in the thirteenth century. It gave also the name to the 
uezd of Vodskai piatina. In the nineteenth and first half of the twentieth 
centuries Koporye Bay was one of the best — and closest to St. Petersburg 
— places for the under-ice herring fisheries. Now the environment of 
Koporye Bay is considerably changed. This region of natural reproduction of 
salmon is losing its significance because of increasing industrial activity, in 
particular, construction of new ports in Luga Bay. The main factor influenc-
ing the ichthyofauna in Koporye Bay are releases of waters heated by the 
Leningrad Nuclear Power Plant in Sosnovy Bor town.

The earliest sources of information about the economy of Koporsky uezd 
is the scribe book of the early sixteenth century, which actually started from 
a description of the population and economy as they were developed in 
1470, when the previous assessment was made. The scribe books were writ-
ten for the purpose of taxation and include diverse information. The district 
was described village by village, the arable lands and other grounds were 
fixed, including the fisheries productive enough to be the object of taxation.

From this first scribe book we see that the main fisheries in the area in the 
end of the fifteenth century were situated in the downstream of the Sista 
River, which flows into Koporye Bay (Table 1).15 The fisheries took place in 
the following eight settlements: Konduevo, Kuzmino, Novozuevo, Petrino, 
Sista, Strelna, Urmizno and Zamosh’e. In addition to the Sista River, there 
were fisheries in the Strelna and Kovosha (Kovoshi) rivers and Lake 
Zamostskoe. Fishing gear was not described, only once a net in the Sista 
River was mentioned. No weirs were noticed in that time. Possibly they were 
not used in 1470 at all, otherwise scribers would have recorded them because 
they were interested in increasing taxes and a weir was obviously an object 
for taxation.

The same scribe book describes the situation in 1501.16 Fisheries were re-
corded in ten settlements, eight of which were named. The composition of 
villages was notably different from that in 1470: in 1501 fisheries took place 
mainly in the Rivers of Lemovzha, Oredzeh, Vruda (right tributaries of the 
Luga River), in the River Kernova (now known as the Voronka River, feed-
ing Koporye Bay) and Lake Glubokoe (the Sista River basin). Weirs were 
recorded in all these rivers with two in the Kernova River and one weir, 
which was not attributed to particular location. Also rod fishing was men-
tioned in the Prikuplia village.

We have to note that the amount of the fish in the catches, we have calcu-
lated, is very approximate and most probably reflects only a portion of the 
catches. More work is needed for archival search and proper quantification. 
Thus far we have analyzed mostly any mention of the fish species, which are

15 NPK. P. 499 - 776.
16 Ibid
important as evidence of the presence of particular fisheries. However, changes in the taxes show some general trends in the dynamic of the catches.

Three fish species were presented in the tax records in the 1500s. Russian names of these fishes are *kurva*, *sig* and *losos’*. *Kurva* or *koriushka* means smelt, *Osmerus eperlanus*. It is presented in the tax data for five settlements. The catches of smelt (taxes multiplied by ten) in one village ranged from 3,000 to 10,000 fish and from 200 to 400 baskets. Sig is a whitefish, *Coregonus lavaretus*. Catches of 10 barrels were indicated in one settlement. Losos’ can potentially mean two species: the Atlantic salmon *Salmo salar* and also trout *Salmo trutta*, which are rather similar especially in a period of upstream migration and probably were not separated by fishers, so we will use for them both the generic name “salmonids.” In 1470 catches of salmonids were listed only in one settlement (Strelna village) and the catch size was very low - 30 fish only.

In the scribe book of 1501 the same fish species as in 1470 were listed: namely whitefish in two villages on the Sista River with catches of 10 barrels in each, smelt in two villages on the Sista River with catches of 10,000 fish in each and salmonids in six villages situated on the Rivers of Vruda, Kernova, Lemovzha and Strelna with catches recorded in two rivers as 20 and 30 fish (Table 1). In addition to these species in six villages, *belaya ryba* were mentioned. The literal translation of *belaya ryba* from Russian is “white fish”, which can be used as a general name for fish white in color and therefore potentially may refers to several cyprinid fish species such as vimba bream *Vimba vimba*, roach *Rutilus rutilus*, dace *Leuciscus leuciscus*, and ide *Leuciscus idus*. Moreover, given that white fish were listed in catches together with salmonids, in some way regarded as a less important addition to them, it also may include the whitefish *Coregonus lavaretus*, although this species in other villages was named *sig*.

There is a clear relationship between the mention of weirs and the presence of salmonids in catches. In most cases salmonids were present in those settlements where weirs were used. The Oredezh River is the only exception, where in catches with weirs only white fish was mentioned, probably because this tributary of the Luga River is too far inland from the sea. It seems that fishing technologies changed considerably during the period from 1470 to 1501, resulting in the spreading of weirs in the area. Clearly, weirs were not invented in this period, as they are the best known and wide-spread fishing gear among Finno-Ugric peoples from prehistoric times. Most probably something changed in the economy of the area that made the efforts to construct weirs worthwhile. As we know from the history of fisheries in the Russian North the construction of weirs was facilitated by population growth in the settlements or by the appearance in the area of the big landowner (for instance, a monastery).

The construction of weirs led to an increase in the significance of salmonids. Probably as a result, salmonids, as the most valuable product, more
often than earlier became used for taxation purposes, instead of smelt. In 1501 smelt was mentioned only in two out of ten cases in comparison with six out of eight cases in 1470. At the same time it is unlikely that smelt received less attention from the fishers than early; it was most probably fished on the same level, but was more seldom used for taxation. In general it seems that smelt is one of the fish species that are easiest to fish – no special gear, and no special techniques and skills are needed for smelt fishing. When it goes into rivers in large quantities even women and children could fish it using buckets and baskets.

The next description of the Koporye area was found in the Swedish cadastra of the early seventeenth century. The town was known as Koporye or Caporie/Capurien, a residential town of the län of Caporie, which constituted an important part of Swedish Ingria. This was soon after the long and destructive war and the economic crisis that took place in the late sixteenth century in Northwestern Russia. The war probably resulted in decline of fisheries, and the Swedish documents mentioned only a few locations where fisheries occurred.

In the eighteenth century the Koporye area was controlled by the Emperor’s Court Office. The supply of the Emperor’s Court with food, including fish, was a very important part of the activities of this institution. The Emperor’s Court Office possessed a lot of productive fisheries in the Volga River basin, and the major share of fish for the court was delivered from that area. As for the fisheries situated in the Eastern Baltic region, the Office used them not only for the fish supply, but also for getting money through a system of leasing.

In spite of the existence of its own fisheries, the Emperor’s Court Office used to buy fish from the local merchants. The announcements on the opening of the competition for the contract were published in the newspaper Sankt-Peterburgskie Vedomosti. For example, on June 2, 1735 it was proclaimed by the St. Petersburg Court Office that it would like to receive regularly live and frozen fish of different sorts and crayfish. The announcement was supplemented with a table of prices for the different sorts of fish. From this list (see table 2) we can study the composition of the fish species delivered to the Tsar’s table from the St. Petersburg area. It is interesting to note that eel was relatively cheap in those times; even big fish more than 71 centimeters long cost only 17 kopecks.

As we can see, the fisheries of the Eastern Baltic provided the Emperor’s court with the different kinds of fish, including big salmon (more than 71 centimeters long), trout about 40 centimeters long, and others. Such an-

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nouncements were published regularly in the newspaper. To get an idea of the quantity of fish consumed by the Emperor’s Court, we have to analyze Table 2. The data on the fish consumption of the Court in 1751 was published as additional information for the possible suppliers.\textsuperscript{21} Only the data on live and frozen fish delivered to the Court was given in the table. Another interesting fish mentioned in the documents that was delivered to the Court is the loach (golets in Russian). Today this fish is not an object for fisheries, but as we see from the sources, in the eighteenth century the situation was quite different. In 1752 the merchants sold 100 loaches to the Court Office for 29 kopecks – cheaper than 100 ruffs, but more expensive than 100 gudgeons.\textsuperscript{22}

As we see from the table, all this fish could be delivered from the St. Petersburg region; they are typical for Northwestern Russia. Analyzing the species composition from the point of view of cookery it is evident that most of these fish species were used to cook a fish soup, very popular in Russia known under the name of ukha: such small fishes as ruff, gudgeons, small breams, ides etc. are perfect for this type of the soup.

It is important that the Court did not consume marine fish from the Baltic, neither herring, nor plaice. The possible explanation for this is that they preferred to buy the imported herring and probably other marine fish, preserved using foreign technology and foreign salt. Certainly; Dutch herring was the best known, and later French labardan (salted cod) appeared on the market.

Two accounting books of the Court Office for the years 1729 and 1730, which we managed to find, include data on the selling of salted and live fish on the market of the town of Koporye.\textsuperscript{23} A large fishpond to keep fish alive is mentioned in the documents more than once.\textsuperscript{24} The documents allow us to reconstruct the composition of the fish species sold on the market (Table 3).

This source does not contain information on fishing locations, but we believe it took place in the Koporye area, i.e. rivers flowing into the Koporye Inlet and right tributaries of the Luga River. The source probably represents only a fraction of the total annual catch in the Koporye area but nevertheless allows suggestions about species targeted in fisheries and their ratio.

The source reports six species among which are salmonids (150 and 209 fish sold in 1729 and 1730 respectively), whitefish (144 and 1490 respectively) and four new species with Russian names, salaka, syrt’, v’iun and minoga. The name salaka refers to the herring Clupea harengus, which is known as an important commercial fish in Koporye Bay in the nineteenth century. The amount of herring sold on the market in 1729 and 1730 was astonishingly small (2000 and 600 herrings). Syrt’ means vimba bream

\textsuperscript{22} Ibid. October 13, 1752. P. 5.
\textsuperscript{24} For example: Ibid. D. 670. L. 21.
Vimba vimba, which was a very important commercial fish in the area, but has completely lost its significance now. Probably, vimba bream was also fished earlier, in the fifteenth-sixteenth centuries, but the name syrt’ does not occur in the earlier sources either because vimba bream was called belaya ryba at that time or it was included in this group together with other cyprinid species (see above). Vimba bream was represented on a market also in quite small amounts, 31 and 28 fish.

The name v’iun at present is used for the loach Misgurnus fossilus. This fish has no commercial significance now, but in the nineteenth century it was sometimes fished for food in the southern and western parts of Russia. However, we assume on the base of explanations made by ichthyologist Karl Kessler that in this document this name was used for minoga, or the lamprey Lampetra fluviatilis. Kessler wrote that in the nineteenth century both names were used for lamprey – minoga was mostly used in places where its commercial fisheries took place, while the fishers who caught it irregularly named it v’iun.

As we see, the majority of the fish species caught in the Koporye area are mentioned in the list published in Sankt-Peterburgskie Vedomosti (See Table 1). The exceptions are vimba bream, lamprey, and Baltic herring. Thus, we may assume that the fisheries of the Koporye area took part in supplying the Court. It is interesting that the Baltic herring appeared on the market: it shows that sea fisheries had already developed in the region at least to a certain extent, but the catch was not sent to the Court.

On the base of the market data we calculated the average size of the salmon sold on the market. It was as small as 1.7 kilogram. (In 1730 16 live salmons weighing about 27 kilograms). If this is correct, then the price of the one fish was on average about 8 – 9 kopecks. It is a very low price compared with those stated in the list (Table 2), and we may assume that the Court was interested only in fairly large salmon, and the fish sold on the market of Koporye was not of interest for the Court supply.

Later the Court Office began to lease out the fisheries of the area. The announcements of the leasing of the fisheries allow us to determine the spatial distribution of the fisheries leased out. For example, on April 7, 1739, the Court Office decided to lease out the fisheries in the Rivers Mertvitsa and Vybia, in Lake Lipovskoe and “along the sea coast from Koporye waters to Narva waters.” Later the same announcement was published more than once – for example, in 1745 and 1750.

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25 Grimm O.A. 1889
27 Kessler K. 1864.
The St. Petersburg Governance Chancellery also possessed fishing grounds in the area. For example, in 1753 the Chancellery declared that “the fisheries in the Koporye area – in Sotnikovsky churchyard, near the villages Karakolie, Luzhitsa and Peski and in the Luzhitsa River are to be rented.”

Thus, the documents studied tell us that in the eighteenth century the Baltic Sea coast in the Koporye area was actively used for fisheries. The management system has not been studied yet, but the composition of fish species in the catches and the fact that these fisheries were at least partly controlled by the Emperor’s Court Office leads us to assume that Koporye area took part in supplying the Court with fish.

The Luga River fisheries

The Luga River, 353 km long, inflows into the Luga Bay of the Gulf of Finland and is connected to Narva River downstream by the tributary Rosson’. On the banks of the river there are a lot of settlements including two towns: Yamburg (present-day Kingisepp) and Luga. The emblem of the town of Luga, which it got in the end of the eighteenth century, depicts a salmon. In fact, this river was known as one of the main salmon rivers of the Eastern Baltic area.

The earliest data on the fisheries in this region are dated to the early sixteenth century. In 1500 – 1501 the fisheries were recorded in the villages of Variva and Kurovichi on the Luga River near the town of Yama (in the eighteenth-nineteenth centuries known as Yamburg, now Kingisepp). The source reports that the fishers of these villages must pay tithes on their catches. Two weirs were recorded on the River of Sola (or Solka), the right tributary of the Luga River downstream.

The town Yama was first documented in 1384, when the Novgorodians built a fortress there against the Swedes. They called it Yama or Yamsky Gorodok, after a Finnish tribe which lived in the area. The fortress withstood sieges by the Teutonic Knights in 1395 and from 1444 to 1448. At the end of the Livonian War, it was ceded to Sweden, only to be returned 12 years later, in 1595. Following the Treaty of Stolbovo, it again passed to the Swedes, who kept the name which in Swedish orthography became Jama/Jamo.

The Swedish documents of the early seventeenth century report that fisheries situated in the settlement Kuznetsova belonged to the Yamburg castle, the residence of the Swedish governor of the area. The fishers had to pay rent in kind, including Baltic herring and salted salmonids.

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31 Ibid. November 12, 1753. P. 5.
32 NPK. 1868.
In the early eighteenth century after the re-conquering of the region Peter the Great found well-developed fisheries there. Probably the Swedish administration paid considerable attention to development of fisheries in the area. The big fishing weir dammed the Luga, which was well known later as Koza. This weir became the main element of the fishing infrastructure of the Yamburg area that included a number of riverside fishweirs and nets. The weir Koza played a special role in the fisheries of the area, and we need to address it in more detail. The weir was situated approximately one and a half kilometers upstream from the town Yamburg, on the Luga rapids.

The earliest information we managed to find on this construction dates from 1704, when it was granted by Peter the Great to the Yamburg resident Budansky (or Butykin according to the other documents) as an award for showing the ford in the Luga River to the Russian troops moving to Narva. Thus, we may suppose that Koza was founded during the Swedish occupation and generally the development of the fisheries in the Yamburg area felt a strong impact from the Swedish authorities. When the family of Budansky disappeared in 1838, the weir passed into the hands of the state. In 1842 one half of the weir was given back to a re-appearing legal heir of Budansky. In the middle of the nineteenth century it was owned fifty-fifty by the Ministry of the State Domain and the Yamburg town duma (municipality), which rented its half for 450 silver rubles per year.

The data on the fisheries in the eighteenth century on the Luga River downstream were obtained from the accounting books of the Yamskovitskaia farmstead situated in Yamburg district and controlled by the Emperor’s Court Office. Koza weir was the main part of the fisheries possessed by the farmstead. All the fish caught in the weir were registered in the accounting book. The officials of the farmstead collected 20% of the fish caught by the local peasants, and this was recorded in the books as the “Fifth fish” (Piatennaia ryba). All this fish was sold at the market and the money was sent to the central office.

Two accounting books were found in the Russian State Archives of Ancient documents (RGADA), in fond 1239 (Emperor’s Court Office). These documents described the fisheries and the fish trade in 1730 and 1731. In the accounting book for 1730 the amount of fish caught is registered, while in the document for 1731 the money for the fish sold is recorded. Thus, the accounting book for 1730 enabled us to study the specific composition of the catches, and the source for 1731 gives the opportunity to study the turnover of the catches (salmonids first of all) on the market.

35 Ibid.
According to the accounting book for 1730 salmonides were the most important species caught in the Luga river. The document mentions two names of salmonides – *Lokh* and *Lososki* (little salmons) with 266 and 273 fish caught in 1730 and 1732 and 155 and 194 fishes respectively. We suppose that Lokh is the name for the salmon itself. Normally in the Russian North this word is used for kelts, but Grimm mentioned that the inhabitants of the Luga river basin used it for all the salmons. This name most likely goes back to the Finnish name for salmon – Lohi. As for the second term, we assume that this was the name for the trout or the mixture of trout and small salmon, sold together. The catches noted in this document actually are very modest – in the nineteenth century about 3000 – 5000 salmons were caught in the Luga River, but at that time the main fishing had been moved to the river mouth.

Several other fish species were mentioned in catches in 1730 and 1731 (see Table 3): whitefish (606 and 226 fish), eel (5 and 100), vimba bream (125 and 90), burbot (255 and 155), lamprey (3600 and 1100) dace (10 in 1730), and pike (10 in 1730). As a rule these species are recorded as the fish caught by the local peasants in the small fishweirs, while the salmonids are mainly caught in the weir Koza. According to the document, the fishing season started in April. The lamprey was the main fish caught in this month. The weir Koza was constructed on May 11; May and June were the most productive months for the salmon and trout fisheries.

The accounting book for 1731 enables us to see that the salmonids were the main market-oriented species caught in the region. The fish was sold fresh, salted, and smoked. The fresh fish was sold in the period when the weir Koza was in operation – from May till October. However, at least in the nineteenth century, there was at all the times a passage in the weir which let some fish to pass the gear.

The average size of the salmonids can be calculated using the data on the number and the weight of fish sold in 1731. The average weight of the smoked Lokh was about 2.75 – 3 kg. It is rather hard to calculate the size of the fresh fish. We used the data from the documents of Solovetsky monastery, which operated the fisheries in the Vyg River downstream, in the White Sea area. According to the accounting books of the monastery, the average weight of the fish before smoking was 6.5 kg. The smoked salmons

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39 Grimm O.A. 1889.
41 Grimm O.A. 1889.
43 Ibid. L. 6 ob – 7.
44 Ibid. L. 7 – 7 ob.
46 Grimm O.A. 1889.
weighted on average 3.6 – 5.7 kg. Thus the fish lost about 15 to 35% of its weight during the smoking. Thus, the average weight of the fresh Lokh should be 3.2 – 4 kg.

The total income for the fish caught in 1731 was about 120 rubles. Later the Court Office preferred to lease these fisheries out. At November 15, 1744, the newspaper *Sankt-Peterburgskie vedomosti* published the announcement that persons willing to take over the fisheries in the River Luga should apply to the Yamburg court office to the official von Palman. In the announcement the fisheries are described as “the weir and the collecting of the fifth fish from the small coastal fishweirs.”

On May 22, 1747 in the announcement on the leasing out of the fisheries, the fisheries on the Luga River were described as “the weir, named Koza… and the collection of the fifth fish.” Thus, we can be sure that the fisheries of the area were profitable enough in the eighteenth century to be attractive for the possible lessees. In 1754 the Court Office wanted to get more than 103.6 rubles per year for one half of the weir Koza, and for the right of the “fifth fish” collecting – more than 16 rubles per year.

The other fisheries of the region are also mentioned in the announcements on the leasing of the grounds. For example in the announcement published on November 16, 1750, the fisheries in the village of Kurovichy and waste plot Varivo were mentioned among the other grounds to lease. It is evident that these are the names of Variva and Kurovichi mentioned above and registered in the scribe books of the early sixteenth century.

Thus, we may conclude that the fisheries in the region were probably affected in the seventeenth century by the Swedish administration. In the eighteenth century the fisheries of the Luga River were productive and profitable enough to be the object of leasing, providing catches at least at the level of 400 – 500 salmonids and an income of 120 silver rubles in the early 1730s.

### Narva River fisheries

For centuries, the Narva River was the western frontier of the Russian lands. So in this paper we present only the data from Russian sources describing the Russian, right bank of the river. At the same time no one doubts that the sources on the history of the town of Narva founded in the thirteenth century might contain a lot of information on the history of fisheries on the left bank.
of the river. For instance, there are mentions that in the 1240s the settlement of Narvia (Narva) was inhabited by fishers and farmers.\textsuperscript{54} In 1345 the king Eric IV gave to the town of Narva the right to fish upstream and downstream from the fortress and to buy eel on the places where it was caught. In the fourteenth and fifteenth centuries images of sturgeon are seen on the emblem of Narva town.\textsuperscript{55}

According to records from the 1470s, inhabitants of the villages Norovskoe, Tyavzino, and Zakhanie on the Narva River banks paid a tithe for the fisheries.\textsuperscript{56} In 1492 the town of Ivangorod was founded on the Narva River right opposite the fortress of Narva and had a strong influence on the development of fisheries. In 1499 the scribe recorded that 30 weirs operated on the river by the inhabitants of the town Ivangorod.\textsuperscript{57} In 1565 one fishing station, 32 big weirs, and 23 small weirs were situated in the downstream of the Narva River, but then the amount of gear decreased, and in 1572 only 20 big weirs and 19 small weirs were listed for almost the same area.\textsuperscript{58}

The documents show that the spatial distribution of fisheries was relatively stable. Thus, in 1571 the scribes recorded the fisheries in the same villages of Tyavzino and Norovskoe as in 1470.\textsuperscript{59} It was mentioned that the fishers of the latter settlement caught in the sea “Baltic herring, roach, and other fish”.\textsuperscript{60} It is the only data on fish species caught in the fifteenth – sixteenth centuries, but a wide use of weirs allows us to suggest that the most important fish was salmon.

For the early seventeenth century we know only that the Swedish governor of Ivangorod controlled the fishing grounds of Petrovsky pogost, which had to pay rent in money and in kind, including whitefish (\textit{Coregonus lavaretus}), salted and fresh fish.\textsuperscript{61}

The data on the Narva River fisheries in the eighteenth century is rather scarce. Like all the major fisheries of the Eastern Baltic after it was reconquered by Peter the Great, the fisheries of the Narva River were controlled by the Emperor’s Court Office. One interesting detail is that the fisheries were obviously operated jointly by the Emperor’s Court and the army. In 1745 those who wished to take over the Narva River fisheries had to apply to Narva garrison chancellery.\textsuperscript{62} Later the possible farmers had to apply to the Court Office or to the Chamber-College of Estlandia and Liflandia.

\textsuperscript{54} Liber census Daniae.1240. See http://www.e-narva.info/modules.php?name=Pages&go=page&pid=3
\textsuperscript{56} NPK. 1886.
\textsuperscript{57} NPK. 1905.
\textsuperscript{59} NPK. 1905.
\textsuperscript{60} Ibid.
\textsuperscript{61} Gadziatsky S.S. 1947. P. 9
(the state body responsible for the collecting of taxes in the region of the Baltic governancies).\textsuperscript{63}

We got some information on the state of these grounds using the announcements on the leasing of these fisheries published in the newspaper \textit{Sankt-Peterburgskie Vedomosti}. As we can see from these announcements, the fisheries on the Narva River were divided into separate plots. At July 2, 1745 the announcement was published that the fisheries “in the Narva River downstream from the rapids” are to be taken over.\textsuperscript{64} This announcement was published later in September and November with the remark that no merchants had wished to participate in the competition for these grounds.\textsuperscript{65} Another part of the Narva River fisheries is mentioned in the announcement of June 23, 1746, where the fisheries upstream from the rapids are mentioned.\textsuperscript{66}

In the year 1746 the announcement was published on the possibility of taking over “the Lokh fisheries in the Narva River.”\textsuperscript{67} We can assume that this document concerns the fisheries downstream from the rapids. In the announcement published on June 20, 1755, the fisheries upstream from the rapids were described as eel fisheries.\textsuperscript{68}

Thus, it seems that in the eighteenth century salmon was considered as the most valuable fish caught in the Narva River downstream from the rapids, while eel was the main target for the fisheries upstream from the rapids. To evaluate the profitability and, thereby, the productivity of the part of the Narva River fisheries, we analyzed the announcement of November 21, 1749. It was stated there that for the fisheries in the Narva River downstream from the rapids to the bridge the farmers paid 215 rubles per year, but the officials wanted to get 45 rubles more in the future.\textsuperscript{69} Thus, the merchant was to be sure that the annual profit would be significantly higher than 260 rubles.

To calculate the minimum catch we used the data on the St. Petersburg fish prices published in \textit{Sankt-Peterburgskie vedomosti} at January 27, 1747.\textsuperscript{70} The police controlled the prices in St. Petersburg at that time, and the lists of the approved prices for the different commodities including the fish were published regularly. According to this list, the merchant could sell salted salmon in St. Petersburg for 1.54 rubles per pood, or 9 kopeks per kg. Thus, the minimum quantity of salted salmon to be sold in St. Petersburg to make the fisheries operate without a loss was about 2900 kg. The average weight of the salted Lokh in Yamburg (the Luga River basin) was about 4 kg (see

\textsuperscript{64} Sankt-Peterburgskie Vedomosti. July 2, 1745. P. 8.
\textsuperscript{66} Ibid. June 23, 1746. P. 6.
\textsuperscript{67} Ibid. May 20, 1746. P. 8.
\textsuperscript{68} Ibid. June 20, 1755. P. 6.
\textsuperscript{69} Ibid. November 21, 1749. P. 7.
\textsuperscript{70} Ibid. January 27, 1747. P. 8.
Thus, the minimum annual catch in this plot would have been about 700 salmons. At the same time we have to remember the expenses for the fishing gear, for the preparing of the fish caught and for the transport, and we can assume that the minimum catch to make the fisheries profitable should be not less than 1000 salmons per year.

Conclusion

During a period under the study fishing mostly took place in rivers, and only on a very small scale in the inshore sea waters. Most likely it was because river fishing is more productive than sea fishing when using primitive gear. Only very seldom do sources of the fifteenth–eighteenth centuries mention sea fisheries, in particular, herring fisheries.

The most important gear used in the rivers were weirs crossing the river, targeting mostly fish performing their upstream spawning migration, such as salmon, trout, whitefish, and vimba bream. These fish were also of the highest commercial value. This is why they more often occur in taxation documents, which are the most frequent sources for studying fisheries in that period. It is interesting to note that the Koporye area source from the end of the fifteenth century frequently mentions another anadromous species, smelt, which probably was readily available for very primitive gear during its mass spawning migration in small rivers.

Sturgeon was obviously one of the oldest objects for fisheries in the region. Numerous sturgeon remains were found during the excavations of the settlements on the banks of the Volkhov River. However, the written sources studied do not mention sturgeon for other areas, where it probably was overfished in much earlier times.

Freshwater fish such as roach, ide, pike, and perch regularly occur in the sources, but they were not so significant as the migrating fish species. This is due to several factors: (i) they are not so active in migrations and thus more difficult to catch by passive fishing gear like weir or nets. Migrations of migrating fish take place in known seasons, which facilitates fishing for them; (ii) commercially, freshwater fish are less valuable and (iii) are less numerous because they use only very limited local resources (rivers and lakes) whereas migrants use much richer sea resources for their growth and enter the river only for spawning. Riverine habitats are rather favorable for growing young because of the comparatively low pressure from predators. Eel, however, grow in rivers and spawn in the sea performing downstream migrations, which suggests that migratory behavior is probably the most important feature determining targeting of fisheries in earlier periods.

Originally, the sites of active fisheries were attached to large settlements (Ivangorod, Narva, Yamburg), but with the increase in fishing pressure they gradually moved downstream. We suppose that the dynamics of the number...
of fishing weirs near the town of Ivango rod in the fifteenth–sixteenth centuries was the first manifestation of this pattern. By as early as the end of the sixteenth century, the number of weirs was lower in this area than about half a century earlier. This could be explained by the moving of main fishing areas downstream rather than simple reduction in their number. Fisheries in the downstream of the Luga River were not well developed until the Swedish occupation of this area in the early seventeenth century. In the eighteenth century the fisheries infrastructure here was better developed, most probably due to the Swedish heritage.

Unfortunately at present we are not able to quantify the role of fisheries in the economy of the region in different time periods. This could be a future goal of our project. The other important question which we would like to try to address is the influence of climate on fisheries in the region. It is known that the second half of the seventeenth century was the coldest period in European history, but unfortunately this period coincides with the gap in our data, which could be filled by Swedish data in future.71

71 Acknowledgements: It was possible to start this project thanks to a small pilot project grant given by the international program “History of Marine Animal Populations” (HMAP) for 2003 - 2004. We would like to thank our collaborators in this project, the historian of St. Petersburg region Anna Sukhorukova and GIS specialists Irina Merzliakova and Petr Leon-tiev.
Table 1. The fishing grounds and the level of catches in the Koporye district in the 15-16th cc.

<table>
<thead>
<tr>
<th>Year</th>
<th>Name of village</th>
<th>Name of water system (modern name in brackets, if different)</th>
<th>Basin</th>
<th>Fishing gear</th>
<th>Fish species and estimated catch in brackets, if reported</th>
<th>Taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1470</td>
<td>Zamoshye</td>
<td>Zamostskoe Lake</td>
<td>?</td>
<td>No data</td>
<td>Smelt (400 baskets)</td>
<td>40 baskets of smelt</td>
</tr>
<tr>
<td>1470</td>
<td>Kuzmino</td>
<td>Kovalsha (Kovoshi) River</td>
<td>Gulf of Finland</td>
<td>No data</td>
<td>Smelt (3000 pieces)</td>
<td>300 smelt</td>
</tr>
<tr>
<td>1470</td>
<td>Novzuevo</td>
<td>Kovalsha (Kovoshi) River</td>
<td>Gulf of Finland</td>
<td>No data</td>
<td>Smelt (3000 pieces)</td>
<td>300 smelt</td>
</tr>
<tr>
<td>1470</td>
<td>Kondueno</td>
<td>No data</td>
<td>?</td>
<td>No data</td>
<td>Smelt (200 baskets)</td>
<td>20 baskets of smelt</td>
</tr>
<tr>
<td>1470</td>
<td>Urmizno</td>
<td>Sista River</td>
<td>Gulf of Finland</td>
<td>No data</td>
<td>Smelt (10000 pieces)</td>
<td>1000 smelt</td>
</tr>
<tr>
<td>1470</td>
<td>Petrinl</td>
<td>Sista River</td>
<td>Gulf of Finland</td>
<td>No data</td>
<td>Whitefish (10 barrels) and Smelt (10000 pieces)</td>
<td>1 barrel of whitefish, 1000 smelt</td>
</tr>
<tr>
<td>1470</td>
<td>Sista</td>
<td>Sista River</td>
<td>Gulf of Finland</td>
<td>Net</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>1470</td>
<td>Strelna</td>
<td>Strelna River</td>
<td>Gulf of Finland</td>
<td>No data</td>
<td>Salmonids (30 pieces)</td>
<td>3 salmonids</td>
</tr>
<tr>
<td>1500</td>
<td>Reka i Reka</td>
<td>Vruda River</td>
<td>Luga River</td>
<td>Weir</td>
<td>Salmonides, white fish</td>
<td>No data</td>
</tr>
<tr>
<td>1500</td>
<td>No data</td>
<td>Vruda River</td>
<td>Luga River</td>
<td>Weir</td>
<td>Salmonides, white fish</td>
<td>No data</td>
</tr>
<tr>
<td>1500</td>
<td>Prikuplya</td>
<td>Glubokoe Lake</td>
<td>Sista River</td>
<td>Rod</td>
<td>White fish</td>
<td>No data</td>
</tr>
<tr>
<td>1500</td>
<td>Khodobzha</td>
<td>Kernova (Voronka) River</td>
<td>Gulf of Finland</td>
<td>Two weirs</td>
<td>Salmonides, white fish</td>
<td>No data</td>
</tr>
<tr>
<td>1500</td>
<td>No data</td>
<td>Lemovzha River</td>
<td>Luga River</td>
<td>Weir</td>
<td>salmonides, white fish</td>
<td>No data</td>
</tr>
<tr>
<td>1500</td>
<td>Velikaya Pozhnya</td>
<td>Oredezh River</td>
<td>Luga River</td>
<td>Weir</td>
<td>white fish</td>
<td>No data</td>
</tr>
<tr>
<td>1500</td>
<td>Osinovaya Luka</td>
<td>Sista River</td>
<td>Gulf of Finland</td>
<td>No data</td>
<td>whitefish (10 barrels) and Smelt (10000 pieces)</td>
<td>1 barrel of whitefish, 1000 smelt</td>
</tr>
<tr>
<td>1500</td>
<td>Kopanitsa</td>
<td>Sista River</td>
<td>Gulf of Finland</td>
<td>No data</td>
<td>Salmonids (30 pieces)</td>
<td>3 salmonids</td>
</tr>
<tr>
<td>1500</td>
<td>Petrinl</td>
<td>Sista River</td>
<td>Gulf of Finland</td>
<td>No data</td>
<td>Whitefish (10 barrels) and Smelt (10000 pieces)</td>
<td>1 barrel of whitefish, 1000 smelt</td>
</tr>
<tr>
<td>1500</td>
<td>Strelna</td>
<td>Strelna River</td>
<td>Gulf of Finland</td>
<td>No data</td>
<td>Salmonids (20 pieces)</td>
<td>2 salmonids</td>
</tr>
</tbody>
</table>

Table 2. The list of prices for fish to be delivered for the Emperor’s court in 1735 and actual fish consumed in 1751.

<table>
<thead>
<tr>
<th>Fish</th>
<th>Size (original data are provided in arsheens (0.71 m) and vershok (4.45 cm).)</th>
<th>Price per pood (16.38 kg), in rubles</th>
<th>Number of fish consumed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sterlet</td>
<td>89 cm</td>
<td>4.68</td>
<td></td>
</tr>
<tr>
<td>Sterlet</td>
<td>71 cm</td>
<td>4.05</td>
<td></td>
</tr>
<tr>
<td>Sterlet</td>
<td>67 cm</td>
<td>3.685</td>
<td>5268 (unknown size)</td>
</tr>
<tr>
<td>Sterlet</td>
<td>62 cm</td>
<td>3.525</td>
<td></td>
</tr>
<tr>
<td>Sterlet</td>
<td>58 cm</td>
<td>3.435</td>
<td></td>
</tr>
<tr>
<td>Sterlet</td>
<td>53 cm</td>
<td>3.235</td>
<td></td>
</tr>
<tr>
<td>Sterlet</td>
<td>49 cm</td>
<td>2.785</td>
<td></td>
</tr>
<tr>
<td>Sterlet</td>
<td>44 cm</td>
<td>1.735</td>
<td></td>
</tr>
<tr>
<td>Sterlet</td>
<td>40 cm</td>
<td>1.48</td>
<td></td>
</tr>
<tr>
<td>Sterlet</td>
<td>36 cm</td>
<td>1.08</td>
<td></td>
</tr>
<tr>
<td>Sterlet</td>
<td>31 cm</td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td>Pike</td>
<td>71 cm and more</td>
<td>0.73</td>
<td></td>
</tr>
<tr>
<td>Pike</td>
<td>62 - 71 cm</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Pike</td>
<td>49 - 53 cm</td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td>Pike</td>
<td>40 - 49 cm</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>Pike</td>
<td>36 - 40 cm</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>Pike</td>
<td>31 - 36</td>
<td>0.14</td>
<td>51824 (unknown size)</td>
</tr>
<tr>
<td>Chub</td>
<td></td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>Ide</td>
<td>31 cm.</td>
<td>0.14</td>
<td>5165</td>
</tr>
<tr>
<td>Bream</td>
<td>31 - 36 cm</td>
<td>0.3</td>
<td>5332</td>
</tr>
<tr>
<td>Umber</td>
<td>27 - 31 cm</td>
<td>0.19</td>
<td>7855</td>
</tr>
<tr>
<td>Small bream and ide</td>
<td>22 – 27 cm</td>
<td>0.14</td>
<td>51701</td>
</tr>
<tr>
<td>Burbot</td>
<td>22 – 27 cm</td>
<td>0.075</td>
<td>18295</td>
</tr>
<tr>
<td>Perch</td>
<td>22 cm</td>
<td>0.035</td>
<td>25005 (unknown size)</td>
</tr>
<tr>
<td>Perch</td>
<td>9 – 13 cm</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Crucian carp</td>
<td>9 – 13 cm</td>
<td>0.03</td>
<td>234</td>
</tr>
<tr>
<td>Roach</td>
<td>13 or less</td>
<td>0.015</td>
<td>99077</td>
</tr>
<tr>
<td>Eel</td>
<td>71 and more</td>
<td>0.17</td>
<td>851</td>
</tr>
<tr>
<td>Pike-peach</td>
<td>36 cm</td>
<td>0.37</td>
<td>13</td>
</tr>
<tr>
<td>Whitefish (Sig)</td>
<td>31 cm</td>
<td>0.04</td>
<td>32230</td>
</tr>
<tr>
<td>Salmon</td>
<td>71 cm and more</td>
<td>0.95</td>
<td>1585</td>
</tr>
<tr>
<td>Crayfish</td>
<td>(for 100)</td>
<td>0.97</td>
<td>12538</td>
</tr>
<tr>
<td>Ruff</td>
<td>(for 100)</td>
<td>0.43</td>
<td>52851</td>
</tr>
<tr>
<td>Cisco</td>
<td>(for 100)</td>
<td>0.2</td>
<td>9332</td>
</tr>
<tr>
<td>Gudgeon</td>
<td>(for 100)</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Trout</td>
<td>36 cm</td>
<td>0.38</td>
<td>2320</td>
</tr>
</tbody>
</table>

Source: St. Petersburgskie vedomosti, June 2, 1735, August 25, 1752.
Table 3. *Fish (numbers) sold in the markets of the towns of Koporye and Luga in the 18th c.*

<table>
<thead>
<tr>
<th></th>
<th>Market in Koporye town</th>
<th>Market in Luga town</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1729</td>
<td>1730</td>
</tr>
<tr>
<td>Salmonids</td>
<td>250.5</td>
<td>209</td>
</tr>
<tr>
<td>Whitefish</td>
<td>144</td>
<td>1490</td>
</tr>
<tr>
<td>Vimba bream</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td>Eel</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>Lamprey</td>
<td>1197</td>
<td>3600</td>
</tr>
<tr>
<td>V’uin (lamprey ?)</td>
<td>587</td>
<td>1150</td>
</tr>
<tr>
<td>Baltic herring</td>
<td>2000</td>
<td>600</td>
</tr>
<tr>
<td>Burbot</td>
<td>142</td>
<td>300</td>
</tr>
<tr>
<td>Pike</td>
<td>95</td>
<td>204</td>
</tr>
<tr>
<td>Ide</td>
<td>56</td>
<td>76</td>
</tr>
<tr>
<td>Roach</td>
<td>2258</td>
<td>2225</td>
</tr>
<tr>
<td>Perch</td>
<td>51</td>
<td>186</td>
</tr>
<tr>
<td>Crucian carp</td>
<td>201</td>
<td></td>
</tr>
</tbody>
</table>