

Historical occurrence of Atlantic sturgeon, *Acipenser oxyrinchus* Mitchill, 1815, in the tributaries of the Vistula River in Poland

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Abstract. All known historical accounts of the occurrence of Atlantic sturgeon (*Acipenser oxyrinchus* Mitchill) in the tributaries of the Vistula River are presented and analyzed. Sturgeon occurred in most large, medium, and small Vistula tributaries and in the upper reaches of the Vistula River in Silesia. The fish either migrated or strayed there rarely and irregularly, usually as single specimens and mainly during high waters. The data available do not provide evidence that sturgeon spawned successfully in any of the tributaries. In particular, the data do not support the commonly held view that Drwęca was the most important spawning river after 1918, which is the basis of the ongoing sturgeon reintroduction program.

Keywords: environmental history, fish distribution, history of fisheries, fish reintroduction

Introduction

Atlantic sturgeon (*Acipenser oxyrinchus* Mitchill) is a diadromous species. According to Kolman et al. (2008), the migration from the Baltic Sea started early in spring, with spawning occurring in the Vistula River and its tributaries from May until

August, and soon afterwards the fish returned to the sea. It reproduced in large, deep (>3 m) rivers. Since the Middle Ages, sturgeon was one of the most important fishes in Poland economically because of its large size and abundance (Cios 2007, 2009). The last specimen was caught in the Vistula River in 1965, and since 2004 a reintroduction program has been ongoing using material imported from Canada (Kolman et al. 2011a).

Sturgeon catches in Poland early in the twentieth century were first analyzed by Kulmatycki (1932). Later, several other ichthyologists briefly outlined the history of Atlantic sturgeon in Poland (e.g., Dyduch 1979, Mamcarz 2000, Kolman et al. 2011a), mainly based on old fisheries and natural history literature that contained only short notes on the species, so many aspects of its biology remain poorly understood. Other historical sources provide much more information that enable a broader approach and a better understanding of sturgeon biology, while also permitting learning about new processes, reinterpreting several statements, and providing the possibility of verifying currently accepted views.

One of the *lacunae* in the knowledge of Atlantic sturgeon is its occurrence in the Vistula River basin, specifically in which tributaries it occurred and what the possible implications are of such information,

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including for natural reproduction. There has been no previous attempt to study this issue in depth, although Kolman et al. (2011b) states that the main spawning grounds were in the Drwęca, Narew, Bug, San, Wisłok, Wisłoka, and Dunajec rivers. The purpose of this article is twofold: 1) to collect empirical and descriptive data, 2) to assess the issue of sturgeon occurrence in Vistula tributaries, and, in particular, to verify current views on natural reproduction. The data and conclusions presented here may be helpful for future activities related to the reintroduction of Atlantic sturgeon in Polish waters and also for interpreting sturgeon remains in archaeological material from various areas in Poland. This study is part of this author's ongoing research on the history of sturgeon in Poland in the nineteenth and twentieth centuries (Cios 2023ab, 2024).

Material and Methods

The study is based on printed evidence. All available published sources were checked for references to sturgeon in the Vistula River basin. Newspapers from all over Poland provided the bulk of the information on sturgeon sightings or catches, and there are many more references in these sources than in the fisheries literature. Both paper and electronic sources were searched. Digital libraries were helpful, but several collections in Poland (including those with German publications) were created without optical character recognition or with low quality versions that limited research using keywords like *jesiotr* and *jesiotrowy* (sturgeon), or archaic or aberrant forms like *yesotr*. Most of the information presented is from newspaper columns on local and domestic issues. The records are usually brief, sometimes consisting of just one sentence. In some cases, data such as the weight and/or length of the fish, the location and method of the catch, the sale of the fish, the name of the fisherman and brief comments are given. All translations were done by the author.

Two types of records were found. The first concerns the catch (and sale) of the fish killed. In 1936,

a law protecting sturgeon was adopted that completely banned catching and killing sturgeon in Poland for three years. However, it was not always obeyed and some fish were poached. Since poaching is illegal, how many fish were killed and in which waters is unknown. Nevertheless, it can be assumed that their number after 1936 was small, because this fish was rare. Therefore, presumably a majority of sturgeon was recorded, also because it was difficult to keep catches of such large fish secret.

The second type of record is sturgeon sightings in the rivers. Since sturgeon often migrated just below the water surface, they were readily visible, even quite far from the banks (e.g., Anonymous 1869). In many cases fishers or poachers tried to catch the fish but were unsuccessful (e.g., Anonymous 1907, 1926a, 1955a, 1955b, Rudnicki 1963).

Knowledge of the occurrence of sturgeon in Vistula River tributaries comes mainly from naturalists (including ichthyologists) working in the field and members of the educated classes living in the countryside, especially those who lived close to rivers. Thanks to these people, reports of the unusual appearance or catch of sturgeon were reported in newspapers but less frequently in other sources. As a rule, the knowledge of illiterate fishers and peasants was lost with their deaths. For these reasons, the data presented in this paper offer fragmentary historic knowledge about sturgeon. However, since some of the data are from the period when sturgeon was abundant in the Vistula River basin up to approximately 1890 when sturgeon could access many waters, presumably the available information is also representative of the status of sturgeon at that time.

Few accounts were published before 1850 because the few newspapers published were not widely available. Members of the educated classes in small towns were also not in the habit of sending correspondence from the countryside. Later, increased newspaper circulation and an increase in magazine publication accompanied by increasing affluence, better education, and growing interest in the natural environment facilitated greater media coverage of all issues related to fisheries, including of sturgeon, which was of particular interest as the largest of the

freshwater fish species in Poland. Knowledge of some catches is due to the fact that the fish were sent to Warsaw for sale and thus was reported in the press. Data from the upper Vistula River in Silesia, upstream of the confluence with the Soła River, are also included. This reach of the river is small and the occurrence of sturgeon in it was always considered unusual (Fig. 1).

(1896) corrected this report stating that, according to the municipality in Przemyśl, the fish was 1.5 m in length and weighed 80 kgs and was sent to Budapest. However, details such as these do not affect the conclusions of the present analysis, because the focus of the paper is the occurrence of sturgeon in various waters and not on how the fish were utilized.

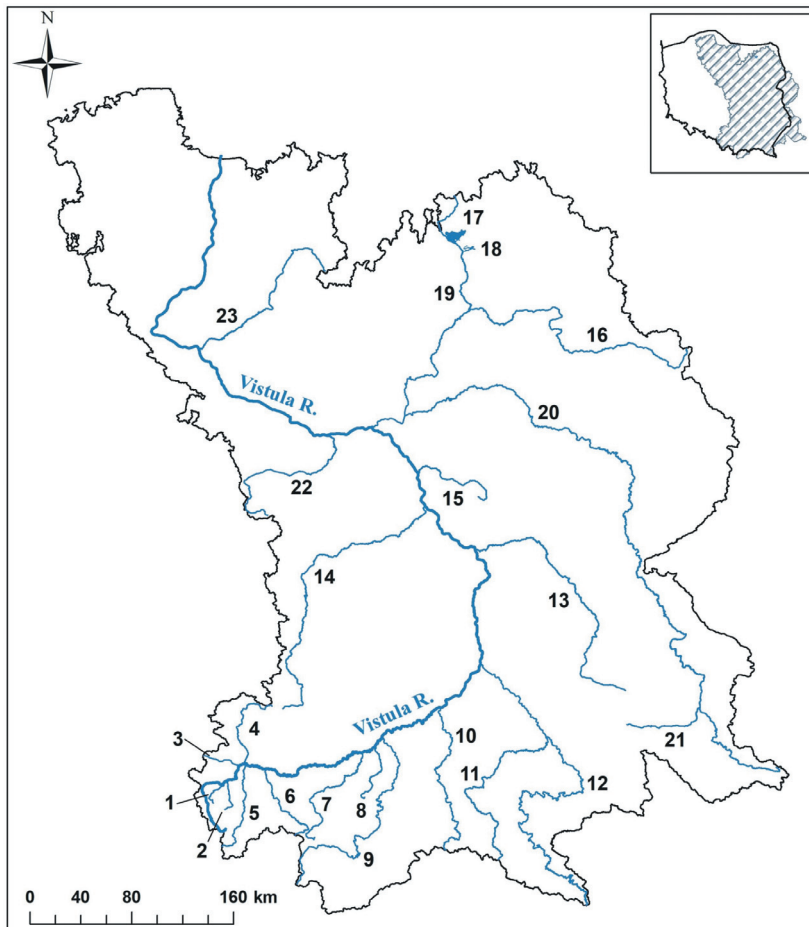


Figure 1. Vistula River drainage area with rivers and lakes mentioned in the text: 1 – Hownica, 2 – Biała, 3 – Gostynia, 4 – Przemsza, 5 – Soła, 6 – Skawa, 7 – Raba, 8 – Uszwica, 9 – Dunajec, 10 – Wiśloka, 11 – Wiślok, 12 – San, 13 – Wieprz, 14 – Pilica, 15 – Świder, 16 – Narew, 17 – Śniardwy, 18 – Roś, 19 – Pisa, 20 – Bug, 21 – Rata, 22 – Bzura, 23 – Drwęca.

In general, the authenticity of reports does not raise doubts. However, some details may demand cautious interpretation. A good example is information about a sturgeon catch in the San River on July 10, 1896. In one report, the weight of the fish was reported as 250 kg, and it was allegedly bought by Jews and sent to Vienna (Anonymous 1896a). Wilkosz

Results

Table 1 presents a list of sightings or catches of sturgeon in Vistula River tributaries. The data are presented in hydrological and chronological order with upstream tributaries listed from the top and downstream tributaries following to the bottom of the

Table 1
Sturgeon sightings and catches in Vistula River tributaries

River/Lake	Date	Source	Comments
Hownica	?	Nowicki (1880a)	Killed with poles
Pond Paprocany	1882	Anonymous (1882)	≈38 kg, caught when a large pond on the Gostynia was emptied
Przemsza near Mysłówice	1845? 1846?	G. (1851)	5 large fish were caught approximately 5–6 years ago
Skawa	1930	Anonim (1955c)	Killed with an axe
Raba in Baczków	1901	Anonymous (1901)	Fish was stuck in the mill-wheel and killed with axes, sold in Bochnia
Dunajec near Niedzica	VI 1924	Anonymous (1925b)	3 m, around Easter 1924 the fish was sighted near Dębno
Wisłoka upstream of Dębica	24 VI 1906	Rozwadowski (1906)	Caught in a pool after high water
San near Jarosław	VI/VII 1840	Anonymous (1840)	Rare news – during spawning many sturgeon were caught
San near Jarosław	1847	Anonymous (1847)	>80 fish were caught
San	1864	Krafft (1874)	4 fish were caught, largest 136 lb
San in Przemyśl	30 V 1869	Anonymous (1869)	People in Przemyśl panicked after seeing many sturgeon in the river
San near Przemyśl	1870	Anonymous (1870)	A few fish were caught
San near Przemyśl	VI (?) 1873	Anonymous (1873b)	11 large fish were caught
lphaSan near Przemyśl	10 VII 1896	Wilkosz (1896)	80 kg, sold in Budapest
San in Babice, near Przemyśl	1900-1910	Rolik (1959)	One fish
San near Jarosław	X 1907	Anonymous (1907)	A large fish was sighted
San in Radymno	Before 1915	Anonymous (1929a)	1 fish was caught
San near Sobiecin	13 VII 1929	Anonymous (1929a)	2 fish were caught, sold to a restaurant
San in Jarosław	VI 1937	Anonymous (1937a)	≈2 m, >100 kg, caught and released
San near Stalowa Wola	26 VI 1955	Anonymous (1955b)	2 fish were sighted, later in Smierdząca Wola until July 5
San in Michałówka	V 1957	Anonymous (1957)	132 kg, poached with a net
Wisłok near Budy Łańcuckie	10 VI 1890	Anonymous (1890a)	≈50 kg, sold to military officers in Przeworsk
Wisłok in Czarne near Łańcut	VIII 1897	Anonymous (1897a)	2 m, 82 kg, sold to a restaurant
Wisłok near Łańcut	25 VII 1900	Anonymous (1900)	3 m, 150 kg, sold in Rzeszów
Wieprz	?	Opalko (1925)	
Pilica near Myszakowice	1899	Anonymous (1899a)	≈300 lb
Świder near Otwock	1889	Anonymous (1889)	≈200 lb, found in shallow water
Narew near Augustów	1845	Kurp (1870)	Author was not sure whether the fish swam from the Nemunas or Vistula rivers
Narew near Łomża	V 1856	Anonymous (1856)	Up to 200 lb
Narew near Łomża	1866	Kurp (1870)	≈180 lb, kept in a cage, exhibited for a fee
Narew near Nowogród	20 VII 1870	Kurp (1870)	>70 lb, sold in Łomża, the catch was a rare event
Narew near Szczuczyn	VI 1918	Grabda (1968)	≈5–6 kg
Narew near Nowogród	1936	Anonymous (1955a)	100 kg, killed with explosives by soldiers
Narew lower reach	27 VI 1938	Rudnicki (1963)	112 kg, 2.5 m, sold in Warsaw
Narew near Szczuczyn	VI 1948	Grabda (1968)	A few fish approximately 6 kg
Narew between Zegrze and Ostrołęka	1954	Anonymous (1955a)	Fish sighted
Narew	1955	Rudnicki (1963)	2 fish

River/Lake	Date	Source	Comments
Narew	1957	Rudnicki (1963)	1 fish
Narew near Czarnów	28 VII 1959	Rudnicki (1963)	3 m, >200 kg, escorted discretely from Tczew, caught dead after being hit by a motor boat
Pisa near its confluence with Narew	VII 1908	Chętnik (1908)	Caught with a spear near a mill
Pisa near Morgowniki	15 VII 1926	Anonymous (1926a)	Fish sighted and later caught, sold in Warsaw
Pisa near Koziół	1945	Cios (2024)	Caught with explosives
defaultLake Roś near Pisz	1880	Benecke (1882)	
Bug near Brok	1865	Anonymous (1865)	105 lb, allegedly first catch in Bug
Bug between Sławatycze and Włodawa	VIII 1873	Anonymous (1873a)	>180 lb
Bug near Nur	V 1925	Anonymous (1925a)	140 kg, killed with a pitchfork, sold in Warsaw
Bug	IX 1927	Anonymous 1927	>3 m, 100 kg, sold in Warsaw
Bug near Słopsk	VII 1934	Anonymous (1934)	98 kg, 2.5 m, caught with a net, hit with an oar, sold in Warsaw
Bug	27 VI 1938	Rudnicki (1963)	112 kg, 2.5 m, sold in Warsaw
Rata (affluent of Bug) near Parchacz-Roczynia	1935	Anonymous (1935)	90 kg, 2.3 m
Bzura near Wyszogród	1932	Anonymous (1932)	980 kg [sic], sighted in shallow water, destroyed 18 nets

table. The empirical material is from 14 tributaries of the Vistula River; the largest are the San, Bug and Narew, the medium sized rivers are the Skawa, Raba, Dunajec, Wisłoka, Wieprz, and Pilica, and the smaller rivers are the Przemsza, Bzura, Hłownica, Gostynia, and Świder. The material also includes information from the Wisłok, Rata, and Pisa rivers that are tributaries of the San, Bug, and Narew rivers, respectively. There are also two lakes – Paprocany retention pond on the Gostynia River and Lake Roś from which the Pisa River flows. The distance sturgeon covered during migrations was up to 1,000 km. Sometimes sturgeon reached the trout zone in the upper Vistula, the Dunajec, and the San rivers. Sturgeon caught by various methods from 1840 to 1957 in the tributaries weighed from approximately 5 to >200 kg.

The descriptive material includes general references to the occasional occurrence or catches of sturgeon in some of the rivers mentioned. Nowicki (1879, 1880a, 1880b, 1882) reports sturgeon from

the Vistula River near Skoczów at the lower border of the trout zone, the Dunajec River at the confluence with the Vistula River and in Tarnów, and the Wisłoka River. According to Borne (1882), sturgeon rarely appeared in the Przemsza River (and probably also in Brynica River, but this information is unclear). There are also two advertisements in the newspapers *Kurjer Warszawski* and *Ognisko* (in 1847 and 1860) of the sale of an estate close to the mouth of the Dunajec River, with information about the possibility of catching sturgeon in this river. Balicki (1831) reports that sturgeon were caught in the Dunajec River. In her memoirs from the early nineteenth century, Grzegorzewska (1889) mentions “the famous sturgeon and salmon caught in the Dunajec River” on her family’s tables.

On November 3, 1897, a sturgeon was spotted and then caught in the upper Vistula River in the village of Zarzecze (which was partly flooded when the Goczałkowicki Reservoir was constructed in 1956). The fish was 2.5 m long and weighed 168 lb (

Anonymous 1897b). The memory of this event survived for almost 30 years (Anonymous 1928a), indicating the uniqueness of the catch. Another sturgeon, weighing about 250 lb, was caught on May 24, 1928, in the Vistula River in Silesia (Anonymous 1928b).

While there is no definitive proof of sturgeon having been caught in the Soła River, in June 1859 several sturgeon weighing from 150 to 200 lb were caught near Oświęcim, a city on the Soła River located approximately 2 km from its confluence with the Vistula. The fish were stranded and could not move. This report includes the comment that sturgeon migrate far upstream in the Vistula River and “even venture into its tributaries” (Anonymous 1859). Toczyski (1853), in his description of the Wisłoka River, stated that “there are no fish except sturgeon, which are fished around St. John’s Day [June 24].”

There are several references to sturgeon in the San River. In a description of Mazovia first published in 1634, Świącicki (1974) states that in spring migrating sturgeon reached only the mouth of the San River. Similarly Kluk (1780) notes that sturgeon migrate up the Vistula River “until they taste the waters of the San River,” and then return. He adds that he does not know why fishers believed this, but raises the possibility that either sturgeon could not find food upstream of the San River mouth or the “natural travel time forces the fish to return.” Hence, both these authors indicate that it was commonly believed that sturgeon usually did not enter the San River, nor did they migrate farther upstream in the Vistula River. A similar view was also expressed later (Anonymous 1853).

Later publications provide information on the occurrence of sturgeon in the San River as far upstream as Przemyśl (Heckel and Kner 1858, Wałecki 1863, 1864) and even Sanok (Nowicki 1880c). Różański (1913), a fisher in Cracow, states in his memoirs that from 1865 to 1871, while living in Jarosław on the San River, he saw sturgeon at the market constantly in June. The fish were caught in such large numbers that fishers had special nets with large meshes, and there were sturgeon slaughterhouses in the city. Often for weeks, fishers kept many large sturgeon tied

with ropes to the bridge because they could not or did not want to sell them since the price was too low. In contrast, Girtler (1999), who was in Przemyśl at the time (he wrote his memoirs around 1870), reports that only “sometimes in July was there sturgeon”.

Sturgeon also appeared in the Wisłok River, a tributary of the San River. This was first reported by the authorities of the city of Krosno, who stated that sturgeon enter the river only when the water is high (Anonymous 1880).

In 1518, a delegation of Italian dignitaries stopped in the city of Warka where they were served a “sturgeon of enormous size” that had been caught in the Pilica River (Cios 2024). Other sources confirm that sturgeon sometimes entered the Pilica River (Anonim 1875, Wiercieński 1920).

Sturgeon was reported in the Bug and Narew rivers (Anonymous 1860). Seligo (1906) states that sturgeon reached the upper reaches of the Bug River, but he did not provide the source of his information. Ślaski (1917) stated that “until recently” sturgeon were not rare in the Narew River; perhaps he meant the lower reach of the river downstream from the confluence with the Bug River.

There are also general references to the occurrence of sturgeon in three other tributaries of the Vistula River not mentioned in Table 1. They are the Biała near Bielsko (Nowicki 1880ac), the Uszwica (Wilkoś 1899), and the Drwęca. According to Borne (1882) and Seligo (1902), sturgeon rarely appeared in the Drwęca River. A similar statement was made by Herwig (1883), although one was allegedly caught in the area of Kurzętnik. Grabda (1968) states that before 1900, up to six to 10 sturgeon were kept by fishers in the Drwęca River in Złotoria, a village located near the river approximately 2 km from its confluence with the Vistula, and were sent by ship to Warsaw. He does not state, however, that the fish had been caught in this river.

Benecke (1882) mentions that he had reports of sporadic sturgeon catches in Lake Śniardwy in the Masurian Lakeland. Sturgeon caught in the Bzura River supplied eggs to a caviar factory in Łódź (C.B. 1864), so there must have been quite a few fish in this river.

Spawning is mentioned in two rivers - the San and the Drwęca. The catch of many sturgeon in the San River during spawning was reported as “rare news” (Anonymous 1840). Grabda (1968) states that, according to fishers, young specimens “drifted downstream en masse” from the Drwęca to the Vistula. Therefore, he concludes that in the period after World War I the main sturgeon spawning river was the Drwęca, but the weir built at its mouth in conjunction with the construction of the mill in Lubicz was an obstacle to sturgeon migration.

Sturgeon entering small rivers were even the basis for April Fools’ hoaxes. Readers of two newspapers were informed about catches of sturgeon in the small Brynica and Rawa rivers in Silesia and were encouraged to come see them for a fee (Anonymous 1925c, 1937b). The next day, the newspapers admitted this story was a prank, noting the large number of curious people who had gone to see the fish.

Discussion

The empirical and descriptive data indicate that sturgeon formerly appeared in most of the waters in the Vistula River basin (17 tributaries and in their drainage areas – rivers Wisłok, Rata and Pisa, two lakes) and in the upper reaches of the river, in which they were sighted rarely, usually as single specimens and mainly during high waters. The data suggest that sturgeon probably entered every tributary since they were also recorded in the Hłownica, Gostynia, Uszwica, and Świder rivers.

The largest numbers of sturgeon were caught in the San River. The oldest sources reporting that sturgeon did not enter the San River and a report of “rare news” (Anonymous 1840) can be interpreted as an indication of the irregular occurrence of sturgeon in this river, mainly during high water as indicated in many accounts. The low economic value of historical fisheries combined with the small number of fishers in the San River (Cios 2024) also suggest that sturgeon was not a regular or common fish in this river.

The second largest number of sturgeon was reported in the Narew River. The rare occurrence of sturgeon in this river is testified to in Gloger’s (1881) statement that sturgeon almost never appeared in the upper reach of the Narew River in the Podlasie region and also by the folk opinion from the city of Łomża, located in the middle reach of the river, about a “terrible monster [i.e. sturgeon], never seen here” (Anonymous 1856). Sturgeon occurred in Masurian lakes in ancient times as is indicated by sturgeon remains identified in archaeological material from the 2,000-year-old site in Stare Kiełbonki by Lake Mokre (Mellin-Wyczółkowska 2007) that is connected with the Masurian Lakeland through the Krutynia River. Unfortunately, Benecke (1882) does not present any details of sturgeon catches in Masurian lakes. Sturgeon could have reached the Masurian Lakeland not only through the Pisa River but also through the Węgorapa River (Angerapp) that flows north into the Pregola River. For example, two fish were caught in the lower reach of this river in spring 1890 near Instertburg (Černâhovska) and in 1899 near Tammowischke (Timofeevka) (Anonymous 1890b, 1899b). However, the eel weir in Węgorzewo, built in the Middle Ages, probably made it difficult for sturgeon to enter the lakes. In contrast, there were no such obstacles on the Pisa River. In the mid-nineteenth century there were a few mills on the river, both floating and stationary, that still permitted fish migrations since the Pisa was a navigable river, and it was forbidden to construct anything that blocked the free flow of water (Grabowski 1863).

Sturgeon occurred in a few lakes and ponds in the southern Baltic Sea catchment area including in the lakes of the Masurian Lakeland, Paprocany retention pond, the mill-pond near Rokutów on the Proсна River (a tributary of the Warta River flowing into the Oder River) (Anonymous 1896b), Lake Grójeckie on the Obra River (a tributary of the Warta River) (Anonymous 1929b), Lake Resko near Kołobrzeg (on the Baltic Sea coast) (Anonymous 1949), and a lake near Berlin (Schulz 1845). The occurrence of sturgeon in lakes is a poorly understood element of its biology in this region (the Lake Ladoga population is better understood).

Grabda's (1968) information about sturgeon in the Drwęca River (where the fish were only kept there awaiting sale) is imprecise and caution is necessary interpreting it since the German sources mentioned indicate that sturgeon was a rare fish in this river. In other papers (Anonymous 1885, Borne 1887) it was pointed out that the weirs in Lubicz were an obstacle to salmon migration and that the effectiveness of the fish pass was limited by the sandy shallows at the confluence of the Drwęca and Vistula rivers. If salmon had difficulty migrating, then it must have been even more problematic for sturgeon. Grabda (1968) based his paper on the accounts of fishers made about thirty years after the catches, and memory fades with time. These sturgeon were probably caught in the Vistula River and then kept in the Drwęca River close to the fishers' houses. Until 1900, fish caught in the Vistula River in this area were chained to poles by the bridge on the Drwęca River awaiting merchants from Toruń (Żelechowska 1964). Similarly, a sturgeon was caught in the Vistula River at the mouth of the Brda River (Anonymous 1933), although some old press reports incorrectly mention the Brda River.

In 1901 a public auction was held in Złotonia organized by a bailiff (announcement signed by Bendrik 1901). The items on sale included a 120-fathom (approximately 200 m) sturgeon net. This suggests that fishermen in the village did not catch sturgeon in the Drwęca River, because it was not possible to use such a large net there, but only in the Vistula River.

This view is supported by the fact that two eminent ichthyologists, Dr. Arthur Seligo and Dr. Włodzimierz Kulmatycki, had good knowledge of the fisheries in the lower Drwęca River. Seligo was the secretary of the Fisheries Association in Złotonia (Anonymous 1888), while Kulmatycki worked in the Agricultural Institute in Bydgoszcz from 1922 until his death in 1939. Had sturgeon been reproducing in the Drwęca River, they would have known this and reported it in their papers. Kulmatycki (1932) even states that fishers in the lower Vistula River believed that sturgeon migrated to the upper reaches of the river to reproduce there.

Old fisheries publications lack information on spawning sites in the Vistula River basin. This includes Wałęcki (1964), although it is referenced as such a source by Kolman et al. (2011b). Information on spawning in the Vistula River, in particular that from Sapalski (1862), will be analyzed in a separate paper currently being written by this author. As regards the San River, the only account (Anonymous 1840) must also be considered with caution since there is a lack of any other information on spawning in this river.

Grabda's (1968) conclusion that Drwęca was the main sturgeon spawning river in the Vistula basin is unfounded and lacks credible evidence, especially regarding the exact locations, times, and years of small sturgeon catches. Other unsubstantiated statements in his paper must be treated with caution such as the assertion that Warsaw was "the main supplier" of caviar to St. Petersburg. The only information available on the occurrence of a large number of small sturgeon (10–17 cm long), but of unknown origin, is from the lower Vistula (Anonymous 1926b). Similarly, Kulmatycki (1932) notes that Vistula fishers sometimes caught sturgeon <20 cm long in the fall. Perhaps Kulmatycki (1932) and these fishers in the Drwęca River were referring to information that was published in a few newspapers at that time.

The occurrence of sturgeon in Vistula River tributaries cannot be interpreted as evidence that this species spawned in these waters. The sporadic occurrence of sturgeon suggests strongly that it strayed into these waters. Even if spawning occurred sometimes, there is no evidence that it was effective because no populations regularly returned to these spawning grounds. The situation in the Warta River was similar (Cios 2023ab). Brevé et al. (2022) also report that the species displays homing and that in Western Europe sturgeon most probably strayed into minor rivers since they did not provide suitable spawning habitats.

The possibility of sturgeon occurring throughout the Vistula River basin should be taken into account when interpreting fish remains in archaeological materials. However, Polish studies generally follow the opinion of Kaj (1957) that the identification of fish

that do not occur in surrounding waters is an indication that they entered human habitats through trade or were tributes.

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