

Structural Changes of Sturgeon Catches in the Bulgarian Danube Section

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Abstract: An analysis was made of the catches of sturgeons along the Bulgarian stretch of the Danube River for the last 80 years. The total average annual catches decreased from 64 t in 20s-40s of the 20th century to 25 t in the last 8 years. The participation of different species in the catches considerably changes during the studied period. Both the Russian sturgeon and the Stellate sturgeon what occupied the most part in the catches in the past have lost their economical value at present. Similar situation with the Sterlet sturgeon was registered. The Beluga sturgeon is the most significant species in the Bulgarian catches of sturgeons being the main source of caviar during the last years as well.

It is necessary to restock the native sturgeon species, as well as to stop the catches in the Black Sea and the catches with hook lines in the Danube River. A complete defence of sturgeon catches in all countries of the region is suggested for at least 5 years.

Key words: Sturgeon catches, Low Danube River

Introduction

The sturgeons were always a desired subject for fishing due to their delicious meat and caviar. There are some data reported in the archaeological studies (Sokolov, Tsepkin, 1996) about the presence of sturgeons in the fish catches more than 2000 years ago. The human influence on the sturgeon catches is started in the 16th and the 17th centuries (Balon, 1968). Stable decrease of the world stocks was recorded since the late 19th century up to present days (Hensel, Holcik, 1997; Khodorevskaya *et al.*, 2000; Vaysman, Raymakers, 2001; Reinartz 2002). In the Black Sea region the most significant part for the nourishment, growth and spatial distribution of sturgeons is the North-Western part of the Black Sea (Ambroz, 1964, 1966; Salnikov *et al.*, 1975; Ambroz, Kirilyuk, 1979; Chepurnova, Dimitrova, 1981; Shkyahov, Akselev, 1993).

During the first 15 years of the last century, along the Danube River are realized annual catches of sturgeons for about 1000 t (Reinartz, 2002). According to Navodaru *et al.* (1999), during the last years of 20th century, the average annual draughts are about 300 t. Unfortunately, the last official statistic reports for the real catches are not always correct. Usually it is not reported for the poacher's catches, which is possible to exceed the legal catches (Bacalbasa-Dobrovici, Patrishe, 1999).

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Material and Methods

The quantitative characteristics of catches (by weights) is based on the official statistical data and are reported from MAF (Ministry of Agriculture and Forestry). In Bulgaria the statistics of fishing began during the 20th years of the last century (Drensky, 1928) and it is not completed. It does not include generally all years of the century. The data for the region's catches along the Bulgarian Danube River stretch are related for the next 4 species: Beluga sturgeon (*Huso huso*), Russian sturgeon (*Acipenser guldenstaedti*), Stellate sturgeon (*A. stellatus*) and Sterlet sturgeon (*A. ruthenus*). Until 1945, the draughts are reported generally to be divided by species.

During 2001 and 2002, parallel with the official data, the catches in the Danube River were estimated by using rapid rural assessment method (Navodaru *et al.* 1999).

Results and Discussion

Generally the catches of Beluga sturgeon, Russian sturgeon, Stellate sturgeon and Sterlet sturgeon along the Bulgarian stretch of the Danube River for the period 1920-1926 year varied from 29.3 to 72.4 t.

The average annual catches (with the exception of Stellate sturgeon) for that period is 45.1 t (Table 1, Fig. 1). During 1942 the total catch of sturgeon in the Bulgarian Danube River section is 64 t (Grozev, 1952).

Between 1945-1949 (Table 2) Beluga, Russian sturgeon and Stellate sturgeon are recorded in the catches. In that period there are not recorded any data for the Sterlet sturgeon.

According to Marinov (1978) for the time from 1929 to 1959 the Sterlet sturgeon is about 4.3 % from the total catch for the Bulgarian Danube River section.

In terms that the total annual average catch for the period 1929-1959 is 728.4 t, for the Sterlet sturgeon about 31 t, total average catches is obtained namely almost the half of the catches of anadromous sturgeons (48.8 %). During the period of 1945-1949, the main part of the anadromous sturgeon catches were the Russian the sturgeon and the Stellate sturgeon, which represented respectively 50.8 % and 43.5 % of the draughts. The Beluga sturgeon is constituted as 5.7 % percentage.

The data of the average annual catch of sturgeons along the Bulgarian stretch of the Danube River during the period 1960-1974, are submitted in Table 3. At that time the catches are respectively as follows: Sterlet sturgeon – 58.3 % (most of the catches); Russian sturgeon - 28.7 %; Stellate sturgeon - 8.4 %; Beluga - 4.6 %.

Taking into a consideration the average catches in Table 2 and 3, it is noticed the tendency towards decrease is noticed: for the Sterlet sturgeon - 1.5 times, for the Russian sturgeon - 1.6 times and for the Stellate sturgeon – 4.7 times (the greatest decrease). There are no significant differences in the average catches of Beluga .

During the last 8 years unexpected variation is observed of the species prevalence in the sturgeon catches along the Bulgarian stretch of the river (Table 4). Most dominant is the Beluga – 79.1 % from the total sturgeon catch. The tendency of decreasing for the rest of the sturgeon catches is stable and significant. That tendency coincides with the total decrease of catches, which has begun in the 20s of the last century and still continues as well.

The distribution and the significance of the different species of sturgeon during the last 57 years is shown in Table 5 and Fig. 2.

Table 1. Total sturgeon catch (t) in the Bulgarian Danube River section for the period 1920-1926 (according to Drensky, 1928).

1920	1921	1922	1923	1924	1925	1926	Average
29.3	72.4	30.3	44.9	48.9	45.1	45.0	45.1

Remark: The catch of *A. stellatus* is not included

Table 2. Sturgeon catch (t) in the Bulgarian Danube River section for the period 1945-1949 (according to Drensky, 1951).

Species	1945	1946	1947	1948	1949	Average
<i>H. huso</i>	1.4	1.6	1.8	1.6	2.9	1.9
<i>A. gueldenstaedti</i>	13.5	9.8	12.2	25.4	21.7	16.5
<i>A. stellatus</i>	15.6	13.8	16.9	9.7	14.6	14.1
<i>A. ruthenus</i>						31.0
Total	30.5	25.2	30.9	36.7	39.2	63.5

Table 3. Average annual sturgeon catch (t) in the Bulgarian Danube River section for the period 1960-1974 (according to Marinov, 1978).

Species	1960/64	1965/69	1970/74	Average
<i>H. huso</i>	1.0	2.3	1.7	1.7
<i>A. gueldenstaedti</i>	5.5	10.1	15.3	10.3
<i>A. stellatus</i>	3.8	3.0	2.3	3.0
<i>A. ruthenus</i>	21.2	17.7	24.0	21.0
Total	31.5	33.1	43.3	36.0

Table 4. Sturgeon catch (t) in the Bulgarian Danube River section for the period 1995-2002 (data of NAFA, MAF).

Species	1995	1996	1997	1998	1999	2000	2001	2002	Average
<i>H. huso</i>	10.8	23.5	30.7	31.2	27.0	18.4	6.6	9.9	19.8
<i>A. gueldenstaedti</i>	3.8	1.7	3.6	5.3	4.0	0.9	0.6	1.2	2.6
<i>A. stellatus</i>	0.03	0.5	0.2	3.7	6.0	1.1	0.7	1.7	1.7
<i>A. ruthenus</i>	0.06	0.8	0.4	1.2	1.5	1.6	1.2	2.8	1.2
Total	14.7	26.5	34.9	41.4	38.5	22.0	9.1	15.6	25.3

Table 5. Percentage proportion by species of the sturgeon catch in the Bulgarian Danube River section for the period 1945-2002.

Species	1945-1949	1960-1974	1995-2002
<i>H. huso</i>	3.0	4.6	79.1
<i>A. gueldenstaedti</i>	26.0	28.7	10.5
<i>A. stellatus</i>	22.2	8.4	6.7
<i>A. ruthenus</i>	48.8	58.3	3.7
Total	100	100	100

Until the 50s of the last century the most significant species from the anadromous sturgeons along the Bulgarian section of the Danube River are the Russian sturgeon and the Stellate sturgeon – more than 90 %. During the 60s and 70s the catches of these sturgeons decrease about 3 times and in the recent years the Russian sturgeon and the Stellate sturgeon catches are hardly 17 %. The catches of Sterlet sturgeon are

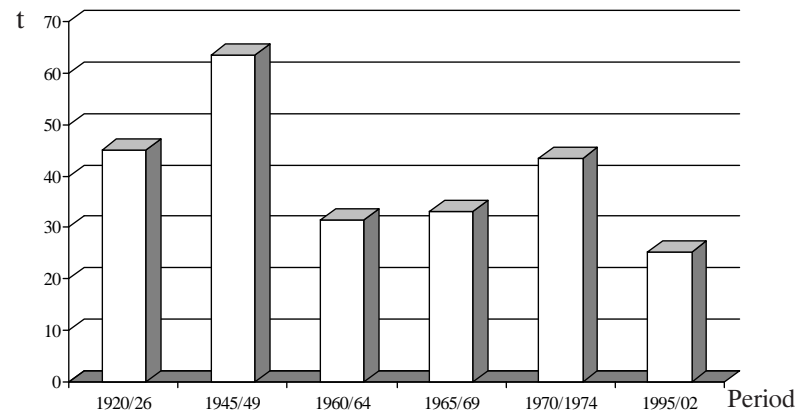


Fig. 1. Average annual sturgeon catch (t) in the Bulgarian Danube River section for the period 1920-2002. (The catch of *A. stellatus* is not included for the period 1920-1926)

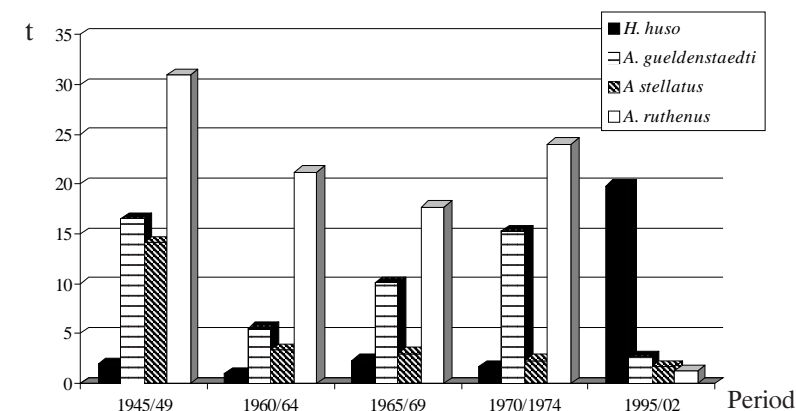


Fig. 2. Average annual sturgeon catch (t) by species in the Bulgarian Danube River section for the period 1945-2002

also significant and till the 70s are almost the half of the total sturgeon catch. During the last 8 years their share is about 4 %.

According to the data for the draughts of the Russian sturgeon, the Stellate sturgeon and the Sterlet sturgeon, a tendency of significant decrease in their stocks is observed. Those species have already lost the main part of the sturgeon catches along the Bulgarian stretch of the Danube. That fact could be explained with the excessive catches during the last 50 years, as well as with the catches of juvenile individuals (Drensky, 1951; Bacalbasa-Dobrovici, Patrishe, 1999).

The building of “Iron Gates” 1 and 2 is the reason for breaking the main passage of sturgeon migration. It reduced also the spawning places. This is quite obvious, especially in the Middle stretch of the Danube River (Hensel, Holcik, 1997), where as a matter of fact, those species of sturgeons appeared to be extinct. On the other hand after the building of “Iron Gates” 2 the catches of Beluga in the Bulgarian Danube River section increased significantly.

This could be explained with the movement of the main spawning sites of Beluga sturgeon during the last years. At present they are located between “Iron Gates” 2 -

863 rkm, and Lom - 750 rkm (Vassilev, 2003), where the Beluga is concentrated for reproduction.

Exactly along this stretch and further downstream (845-690 rkm), about 85 % from the total Beluga catches are realized along the Bulgarian stretch of the Danube. In this case the increasing of Beluga draughts does not mean that the stocks of the species have grown up.

According to our evaluation, accomplished by the RRA method (Navodaru *et al.*, 1999), the official data for the Beluga catches in 2001-2002 are reduced almost 2 times.

It means that the real data for the Beluga catches during the last 2 years are 16.5 t at average (about 150 individuals annually). The main reason of this is not the illegal catch, but the fact that fishermen do not report the real catches because of the taxes.

Another index, which shows that the stocks of Beluga sturgeon decrease is the insufficient use of the natural spawning sites (Vassilev, 2003). It means that those natural places are still not reached by the producers ready for spawning.

Taking into consideration that the abundance of Beluga in the Danube River and the Black Sea is entirely determined only by the natural reproductivity, the fact with great significance is how in the future the human would be ready to exploit the Beluga sturgeon and its stocks.

Conclusions

Because of the permanent tendency of stable decrease of sturgeon catches and respectively of their stocks in the Low Danube River and the Black Sea, as well as, the fact that the spawning sites are not reached still by spawners, the artificial restocking with fingerlings is quite necessary.

It is urgent to lay down interdiction for sturgeon catches in the Black Sea. The sturgeon catch with hook lines in the Danube River must be stopped. Practically, the best way for restoration of sturgeon stock in the Low Danube River and the Black Sea is the prohibition of catches in all countries in the region for at least 5 years.

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Промени в уловите на есетровите риби от българския сектор на река Дунав

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(Резюме)

Направен е анализ на уловите на есетрови риби в българския сектор на р. Дунав за последните 80 години.

Средните годишни улови са намалели от около 64 t през 20-те - 40-те години на миналия век до 25 t през последните 8 г. През целия период значително се променя участието на отделните видове в уловите. Руската есетра и пъстругата, които са заемали най-голям дял от уловите на проходните есетрови, понастоящем са загубили стопанското си значение. Подобно е положението и с чизгата. Най-голямо значение за българските есетрови улови и получаването на черен хайвер през последните години има моруната.

Необходимо е изкуствено заребяване с автохтонните видове есетрови риби, спирането на улова им в Черно море и уловите с кърмаци в р. Дунав. Предлага се пълна забрана за улов на есетрови риби за всички страни от региона за срок най-малко от 5 години.