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STATE OF THE STURGEON STOCKS IN THE DANUBE RIVER

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Abstract. Approximately 3/4 of the world sturgeon catches consist of species *Huso huso* L i n n a e u s, 1758 (beluga), *Acipenser gueldenstaedti* B r a n d t, 1833 (osetra) and *Acipenser stellatus* P a l l a s, 1771 (sevruga), and distribution and fishing of these fish species are confined to the hydrographic basins of Caspian Sea, Sea of Azov and the Black Sea, operated by the states of CIS, Iran, Romania, Bulgaria, Turkey, Ukraine and Serbia. Annual sturgeon catches have declined recently in most countries exploiting these fish stocks, although it is widely recognised that it is impossible to assess the quantity sold on the black market. Despite errors of assessment of real catch, a general trend of rapid decline of breeding stock is observed. Regarding the progeny resulting from natural spawning, the data and observations of research fisheries have revealed the following aspects: in the catches were recorded juvenile specimens of *Acipenser stellatus (*sevruga) with lengths between 12–20 cm, juvenile specimens of *Huso huso* (20–25 cm), and *Acipenser gueldenstaedti* (12–18 cm); the percentage of the total number of juvenile individuals caught, *Acipenser stellatus* is 70%, of *Huso huso* – 29% and of *Acipenser gueldenstaedti* – 1%.

Keywords: sturgeon, migration, stocks, catches.

AIMS AND BACKGROUND

A knowledge of the current characteristics of inland waters and of creatures which inhabit them is needed in order to gather useful elements for the substantiation of measures to ensure, on the one hand, decrease of the negative effects and, on the other, to identify the best ways for realisation of production potential.

The Danube is a veritable natural axis of Europe, and had increasingly participated in the expanding economic trends on the continent[1]. The continuous process of industrial development, as well the barrier practiced in flooded meadows of the Danube river and in the interior rivers for agriculture, and dams builder to achieve accumulation of water have caused essential changes in the characteristics of flowing waters with direct consequences on the life of hydrobiontes[2].

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Approximately ¾ of the world sturgeon catches include the species *Huso huso* L i n n a e u s, 1758 (beluga), *Acipenser gueldenstaedti* B r a n d t, 1833 (osetra) and *Acipenser stellatus* P a l l a s, 1771 (sevruga), and distribution and fishing of these fish species are confined to the hydrographic basins of the Caspian Sea, Sea of Azov and the Black Sea, operated by the states of CIS, Iran, Romania, Bulgaria, Turkey, Ukraine and Serbia. Annual sturgeon catches have declined recently in most countries exploiting these fish stocks, although it is widely recognised that it is impossible to assess the quantity sold on the black market. Despite errors of assessment of real catch, a general trend of rapid decline of breeding stock is observed[3].

With an appreciable sector (ca. 1075), it is imperative that Romania must show an active and constructive position in the policy of exploitation and protection of fishery resources in the Danube river. Recent years there is probably the most severe crisis in the history of sturgeon showing an evidence through records from FAO databases, although, it is widely agreed that these data are not the real, relying only on the catches reported without taking into account the local markets or quantities on the black market[4].

EXPERIMENTAL

The continuous process of industrial development, as well as barrier practiced in flooded meadows of the Danube river and interior rivers for agriculture, and also dams constructed to achieve accumulation of water have caused essential changes in the characteristics of flowing waters, with direct consequences on the life of hydrobionts.

Characterisation of marine sturgeon migration for 2008. The study of migration and breeding areas was performed by analysis of catches in the area of Danube delta Biosphere Reserve (DDBR) and upstream on the Danube to the Iron gates II, based on the results of scientific fishing activity in the various river sectors. Breeding areas were rated after sturgeon agglomeration on certain sectors of the Danube where the frequency of catches was higher.

RESULTS AND DISCUSSION

Distribution of catches in the Danube river shows that the territory of DDBR, in general, has more than 50% of the fished on Romanian territory, although it represents 40% of the length of the migration area of sturgeon in condition of using about 22% of the Romanian fishing effort[5]. Statistical analysis of the marine migratory sturgeon catch in 1994–2005 (statement made on the basis of official reports) reveals that they are maintained at a relatively low level compared with

the previous period (after the implementation of hydropower and navigation Iron Gates II (Table 1).

Table 1. Statistics of marine migratory catch sturgeon in Romanian sector of the Danube river

Species	Catches		Area Grindu city		Crindu city – Iron Gates II	
	kg	%	kg	%	kg	%
		2000				
Huso huso	26182	100	10542	40.26	15640	59.74
Acipenser gueldenstaedti	17842.5	100	4147.5	23.25	13695	76.75
Acipenser stellatus	29513.5	100	9963.5	33.76	19550	66.24
Total catches	73538	100	24653	33.53	48885	66.47
		2001				
Huso huso	30623	100	11104	36.26	19519	63.74
Acipenser gueldenstaedti	20936	100	4206	20.09	16730	79.91
Acipenser stellatus	27940	100	8420	30.14	19520	69.86
Total catches	79499	100	23730	29.85	55769	70.15
		2002				
Huso huso	16590	100	9030	54.43	7560	45.57
Acipenser gueldenstaedti	2535	100	1298	51.20	1237	48.80
Acipenser stellatus	9677	100	7191	74.31	2486	25.69
Total catches	28802	100	17519	60.82	11283	39.18
		2003				
Huso huso	14211	100	7073	49.77	7138	50.23
Acipenser gueldenstaedti	943	100	312	33.08	631	66.92
Acipenser stellatus	3800	100	3197	84.13	603	15.87
Total general	18954	100	10582	55.83	8372	44.17
		2004				
Huso huso	13239	76.6	13239	76.6		
Acipenser gueldenstaedti	360.2	2.1	360.2	2.1		
Acipenser stellatus	3689.6	21.3	3689.6	21.3		
Total catches	17288.8	100	17288.8	100		
		2005				
Huso huso	7318.6	67.5	7318.6	67.5		
Acipenser gueldenstaedti	144.0	1.3	144.0	1.3		
Acipenser stellatus	3375.7	31.2	3375.7	31.2		
Total catches	10838.3	100	10838.3	100		

In 2004–2005 in the recorded catches between Grindu area and Iron Gates II are also included the quantities used for artificial spawning of sturgeon species. Regarding the progeny resulting from natural spawning, the data and observations of research fisheries have revealed the following aspects:

- in the catches were recorded juvenile specimens of *Acipenser stellatus* (sevruga) with lengths between 12–20 cm, juvenile specimens of *Huso huso* (20–25 cm), and *Acipenser gueldenstaedti* (12–18 cm);
- the percentage of the total number of juvenile individuals caught of *Acipenser stellatus* is 70%, of *Huso huso* – 29% and of *Acipenser gueldenstaedti* – 1%.

Catch and data analysis of scientific fishing activity reveals that the first migratory species has been beluga (*Huso huso*) in March, then followed osetra (*Acipenser gueldenstaedti*) and sevruga (*Acipenser stellatus*) in April. During May–July the migration of these three species has overlapped. Although, sturgeon migration has a maximum in the spring, followed by a second peak, but with lower magnitudes fall, practically it is carried out throughout the year, and due to lower stocks the typical migration is distorted lately. Relative to biomass, by species, dominant in the catch was beluga (*Huso huso*), followed by sevruga (*Acipenser stellatus*) and osetra (*Acipenser gueldenstaedti*) presented in Figs 1 and 2.

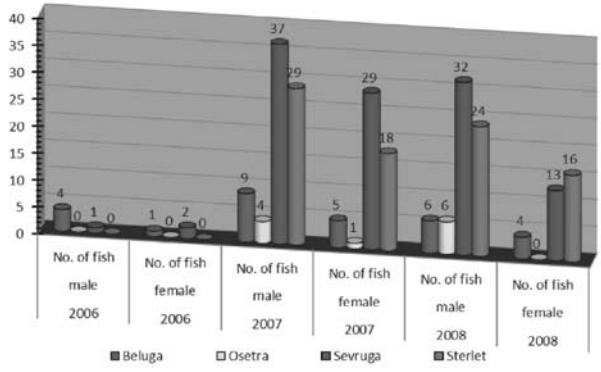

Fig. 1. Situation of sturgeon catches in the period 2006–2008 using for artificial spawning (fish number)

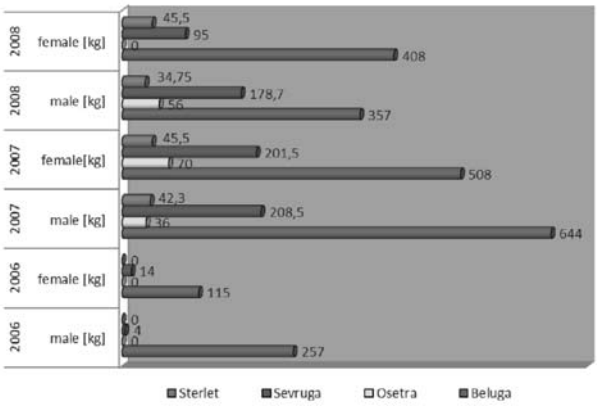

Fig. 2. Situation of sturgeon catches in the period 2006-2008 using for artificial spawning (kg)

Numerically, the sevruga records a higher percentage in the catches followed by beluga and osetra. Although, the migration of these three species is easily differed in period due to temperature values of water which stimulates the triggered migration, the statistical model shows that migration is the same for all species.

CONCLUSIONS

As a general feature it should be noted that during the spring is recorded a higher intensity of migration that is demonstrated by the quantities of sturgeon caught in research fishing activity and artificial spawning program to achieve the populating program of Danube and the development of aquaculture.

To restore the state of marine migratory sturgeon reserves we believe that vigorous measures should be taken for protection in order to maintain and increase stocks of sturgeon in the Danube, through: making special passages at hydroelectric dams to enable passing for brood stock of sturgeon migratory species towards spawning area; to protect juvenile sturgeon, avoiding capturing them in the gear used for fishing in the Danube; collaboration with all riparian countries to locate breeding places and agglomeration of juveniles and their protection; to enrich the fund of sturgeon in the Danube basin through artificial spawning and conducted growth of progeny in specially equipped nursery for populating natural waters.

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