

Inferring functional extinction based on sighting records

Online Appendix

Length and weight data of the assessed specimens, and the age estimation

Sighting records of ship sturgeon within the Danube River Basin were gathered from the literature and from scientists actively working on sturgeon research in the studied area (Table 1). For each observed specimen, reported total body length, weight and gender were obtained when available. Sightings recorded before 1955 were excluded, since they were based either on the total weight of all caught specimens, without the data on the exact number of specimens (Manea, 1980), or they lacked individual length or weight data (Ristić, 1963). The two ship sturgeon specimens, which were observed in the Tisza River in 1998 and reported as being adults with more than 5 kg body weight (Harka, pers. comm.), were not used for further analysis as well, since they lacked exact body weight and length data.

For the relationship of ship sturgeon length and weight with age, individual data on fish age, length and weight reported for the Caspian and Aral Sea (Borzenko, 1950 cit. in Holčík et al., 1989; Tleuov and Sagitov, 1973 cit. in Holčík et al., 1989) were used (Table 2). Age was estimated for each specimen as a mean value based on total length or weight, or both when available. If there was no data on the specimen's sex, relationships for both sexes were used to determine fish age. To account for the inaccuracy in sturgeon aging, correction factor for age assignment by Bruch et al. (2009) was applied ($\text{TrueAge} = \text{EstimatedAge}^{1.054796}$). Resulting age estimations are presented in Table 3.

Table 1. Documented sightings of ship sturgeon (*Acipenser nudiventris*) in the Danube River since 1955, with the reported total body length and weight.

No.	Sighting year	Specimen length (cm)	Specimen weight (kg)	Sex	References
1.	1956	/	16	/	Vásárhely, 1957
2.	1957	/	1.5	/	Vásárhely, 1957
3.	1957	/	6	/	Vásárhely, 1957
4.	1957 ¹	17.5	/	/	Vásárhely, 1957
5.	1961	150	23.5	/	Kálmán, 1961
6.	1975	70	/	/	Hensel and Holčík, 1997
7.	1989	147	20.5	/	Hensel and Holčík, 1997
8.	1992	112	9.1	/	Guti, 2006
9.	1998 ²	/	/	/	Harka, pers. comm.
10.	2003	198	50	/	Sallai, pers.comm.
11.	2003	176	56.2	M	Simonović et al., 2005
12.	2005	/	50	/	Guti, 2006
13.	2009	140	22	M	Suciu, 2009

¹ Between 8 and 10 fingerlings caught, with 15-20 cm body length range (Vásárhely, 1957)

² Two adult specimens with no size data (>5 kg) caught in 1998 in the Tisza River (Harka, pers. comm.)

Table 2. Relationship between ship sturgeon (*Acipenser nudiventris*) age (A) and total body length (TL) and weight (W), estimated based on the individual data on fish age, length and weight reported for the Caspian and Aral Sea (Holčík et al., 1989).

	Caspian Sea	Aral Sea
Length/age relationship (males)	$TL = 30.362 \times A^{0.5981}$	$TL = 44.790 \times A^{0.4120}$
Length/age relationship (females)	$TL = 75.810 \times A^{0.3020}$	$TL = 35.311 \times A^{0.5055}$
Weight/age relationship (males)	$W = 0.1095 \times A^{1.9465}$	$W = 0.0054 \times A^{2.8594}$
Weight/age relationship (females)	$W = 4.1115 \times A^{0.7918}$	$W = 0.1822 \times A^{1.6378}$

Table 3. Age estimations of ship sturgeon (*Acipenser nudiiventris*) in the Danube River based on Holčík et al. (1989) and correction factor by Bruch et al. (2009).

No.	Sighting year	Estimated age ¹	Estimated birthyear ¹	Corrected birthyear ²
1.	1956	13	1943	1941
2.	1957	4	1953	1953
3.	1957	7	1950	1949
4.	1957	0	1957	1957
5.	1961	15	1946	1944
6.	1975	3	1972	1972
7.	1989	14	1975	1973
8.	1992	9	1983	1982
9.	1998	/	/	/
10.	2003	27	1976	1971
11.	2003	24	1979	1974
12.	2005	25	1980	1975
13.	2009	16	1993	1990

¹ Based on Holčík et al. (1989)

² Based on the correction factor by Bruch et al. (2009)

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