Acipenser nudiventris Lovetzky, 1828

Ship Sturgeon
Esturgeon à barbillons frangés
Esturión barba de flecos

Order: ACIPENSERIFORMES

Family: ACIPENSERIDAE

SUMMARY

The Ship Sturgeon *Acipenser nudiventris* has always been rare in the Black Sea and the Sea of Azov and their tributaries. There were originally two isolated populations in the northern Caspian Sea, but only the Ural River population is thought to exist today. In Iran (southern Caspian Sea), the species is known to migrate in several rivers. Its former range in the Danube River included Austria and Slovakia. Most range States reported that their wild populations are currently low. Restocking programmes are carried out in Azerbaijan, Iran, and Kazakhstan, but although the species has been in captivity for 60 years, broodstock is currently difficult to obtain. The species is rarely raised in captivity and there is no recorded international trade in products from aquaculture. Of all range States, only Iran, Kazakhstan and the Russian Federation authorise commercial catch of the species. During the past decade, annual catches of *A. nudiventris* have increased in Iran (from 1.9 tonnes (t) in 1990 to 3.5 t in 2000) and in Kazakhstan (from 12 t in 1990 to 23.8 t in 2000). International trade in 1998 totalled 1,156 kg of *A. nudiventris* caviar imports comprising: 1,004 kg from Iran, 87 kg from Kazakhstan, and 65 kg from the Russian Federation, 42% of which was declared as pre-Convention stock. No export quotas were established for specimens of *A. nudiventris* for 1998. Caviar export quotas set by range States increased for Kazakhstan from 1,500 kg for 1999 to 2,000 kg for 2000. The Russian Federation *A. nudiventris* caviar exports amounted 3,000 kg in 1999, that were probably re-exports from Kazakhstan, exceeding the 1999 export quota (1,500 kg) by 100%. Turkmenistan established the first export quota at 400 kg of caviar for 2000. The latter contradicts the fact that commercial catch of the species is prohibited in Turkmenistan waters and that *A. nudiventris* has been included in the country's Red Data Book.

DISTRIBUTION AND POPULATION

The CITES database lists the distribution of *Acipenser nudiventris* as: Armenia, Azerbaijan, Bulgaria, Hungary, Iran, Kazakhstan, Moldova, Romania, Russian Federation, Slovakia, Turkey, Ukraine, Uzbekistan (Anon., 2000a).

A. nudiventris is classified as Endangered by IUCN (1996):
EN A1acde + 2d Azerbaijan, Bulgaria, Hungary, Iran, Kazakhstan (ex), Moldova, Romania, Russian Federation, Ukraine, Uzbekistan (ex) [River Danube]
Black Sea stock: EN A1acde + 2d Russia, Ukraine [Mediterranean and Black Sea]
Caspian Sea stock: EN A1acde + 2d Azerbaijan, Iran, Kazakhstan
Aral Sea Stock: EX Kazakhstan, Uzbekistan [Mediterranean and Black Sea]
River Danube population: CR A1cd + 2cd Hungary, Romania.

Two morphs of the species have been identified, one anadromous and one sedentary. The anadromous morph has been recorded from the Sea of Azov and the Caspian, Black and Aral Seas and enters associated river systems to spawn. *A. nudiventris* has always been less abundant than other sturgeon species and historically contributed to approximately 1% of the total sturgeon catch from the Caspian Sea. The species has always been rare in the Black Sea and the Sea of Azov (Sokolov and Vasil'ev, 1989). There were originally two isolated migratory populations in the Caspian Sea basin which ascended the Ural and Volga rivers respectively, for spawning (Makarov *et al.*, 1991a; Sokolov and Vasil'ev, 1989), however only the Ural River population is thought to remain in the Caspian Sea Basin (Avetissov, 1992). The non-migratory morph occurs in the Danube and some Ukrainian rivers (Banarescu, 1964; Holcik, 1995; Manea, 1966; Pavlov, 1980). There are no estimates of the total population size for this species, but Avetissov (1992) believes that current stocks in all rivers, except the Ural River, are on the verge of extinction. The historic range of the species included Austria (Fitzinger and Heckel, 1863) and Slovakia (Hensel and Holcik, 1997; Holcik, 1995).

Armenia: No current distribution or status information available.

Azerbaijan: In the past, the species entered the Kura River for spawning (Makarov *et al.*, 1991b; Sokolov and Vasil'ev, 1989). This spawning population used to be the largest for this particular species, however, during 1983-1987, the migrating population was estimated to number only 66-112 individuals and by the end of the 1980s, only one to four individuals passed through the spawning sites (Makarov *et al.*, 1991b). The entire existing stock is maintained by aquaculture, but this has failed to restore the former abundance (Makarov *et al.*, 1991b). In addition, the Lenkoranka and Astara River systems are used by a small number of spawning individuals (Makarov *et al.*, 1991b; Sokolov and Vasil'ev, 1989).

Bulgaria: *A. nudiventris* occurs in the Danube River and was listed in the Red Data Book of Bulgaria in 1985 as Critically Endangered (Karapetkova *et al.*, 1995).

Former Czechoslovakia: The former range included Slovakia (Hensel and Holcik, 1997; Holcik, 1995).

Georgia: The Rioni River provided the main spawning sites in Georgia, although the species was rarely found in this area. In addition, the south east coast of the Black Sea is an important feeding and wintering area for several species of sturgeon (*Huso huso*, *Acipenser stellatus*, *A. nudiventris*, *A. persicus colchicus* and *A. sturio*) that migrate upstream in a number of rivers to spawning grounds. The main rivers involved are the Supsa, Inguri, Chorokhi and particularly the Rioni (Zarkua and Tsuladze, 1999).

Hungary: *A. nudiventris* is considered to be very rare in the Danube and Tisza rivers, with the last specimen in the Drava River recorded in 1989 (CITES Management Authority of Hungary, *in litt*. to TRAFFIC Europe, 10 September 2000).

Iran: *A. nudiventris* migrates to the Sefidrud, Tajen and Babulrud Rivers on the Iranian coasts of the Caspian Sea. Sturgeon hatcheries in Iran apparently obtain breeders of *A. nudiventris* and other species from these rivers (Dr M. Pourkazemi, *in litt*. to IUCN/SSC Wildlife Trade Programme, September 2000). However, Dr J. Holcik (*in litt.* to IUCN/SSC Wildlife Trade Programme, September 2000) believes the species no longer enters the Sefidrud rivers to spawn due to construction of the Mangil Dam in 1961. According to Dr M. Pourkazemi (*in litt.* to IUCN/SSC Wildlife Trade Programme, 25 September 2000) among the Mangil Dam and other dams constructed on the Sefidrud River, there is a remaining distance of 45 km from the dam closest to the estuary, and sturgeon breeders are still observed entering the river to spawn.

Kazakhstan: Historically, *A. nudiventris* entered the Ural River to spawn (Makarov *et al.*, 1991b; Sokolov and Vasil'ev, 1989) and from 1978-1990, the number of spawning individuals was estimated at 1,500 –18,600 (Avetissov, 1992). A winter migrating race of the species occurred in the Aral Sea Basin but is believed to have been extinct since the 1970s (Zholdasova, 1997). A population introduced from the Aral Sea occurred in the Ili River, which flows into Lake Balkash (Sokolov and Vasil'ev, 1989). However, even this population is now believed to be extinct because the lake is drying out (Bond *et al.*, 1992).

Moldova: The Moldovan range on the Danube River is 811 m and sturgeon also occur in the Prut River, a tributary of the Danube River (junction at km 137th) (Anon., 2000b). There have been no records to confirm the presence of *A. nudiventris* for 15 years (Dr V. Lobchenco, *in litt*. to IUCN/SSC Wildlife Trade Programme, September 2000).

Romania: Previously, only the sedentary morph occurred in the Danube and its tributaries. *A. nudiventris* is thought to never have been abundant in the Danube, and is now very rare and considered Critically Endangered in the Danube Basin (Hensel and Holcik, 1997*).*

Russian Federation: In the past, *A. nudiventris* entered the Volga to spawn (Makarov *et al.*, 1991b; Sokolov and Vasil'ev, 1989). Only the Ural River spawning population is thought to remain.

Turkey: No current distribution information available (see Threats to Survival and Domestic Use).

Turkmenistan: *A. nudiventris* is close to extinction in the Amu-Darya River and is very rare in the Caspian Sea (Dr Salinkov, *in litt*. to IUCN/SSC Wildlife Trade Programme, September 2000). It is listed in Category 1

of the 1999 Red Data Book of Turkmenistan, which means it is classified as a "Vanishing species that cannot be saved without special measures" (Salnikov, 1999).

Ukraine: Bacalbasca-Dobrovici reports that *A. nudiventris* is critically endangered or extinct in the Ukraine (*in litt*. to IUCN/SSC Wildlife Trade Programme, September 2000). It has been recorded in the Danube and Karadag regions of the Black Sea coast, very rarely near the mouth of the Dnieper River, and is not known in the main Dnieper, Dniester or Bug rivers. It has always been very rare and is not of commercial value in this area (Pavlov, 1980).

Uzbekistan: *A. nudiventris* is apparently extinct in Uzbekistan, following the drying of the Aral Sea (Birstein, 1993).

Former Yugoslavia: *A. nudiventris* is thought to be critically endangered or extinct in the Danube and the Iron Gate II reservoir (Bacalbasa-Dobrovici, 1997) and is classified as Very Rare and Endangered upstream the Djerdap I dam (Jankovic, 1994).

HABITAT AND ECOLOGY

The maximum weight of *A. nudiventris* is around 120 kg. Male sexual maturity is reached at 6-12 years and in females at 12-18 years. Males then spawn at 1-2 year intervals and females at 2-3 year intervals (Hochleithner and Gessner, 1999). *A. nudiventris* may reach a total length of approximately 1.70-2.03 m, and its maximum recorded age is 36 years (Sokolov and Vasil'ev, 1989).

A. nudiventris was most abundant in river mouths, as its preferred habitat is shallow fresh water with muddy bottoms. It is a benthic feeder with a diet of fish, molluscs, insect larvae, crustaceans and occasionally the eggs of other sturgeon species (Dr M. Pourkazemi, *in litt*. to IUCN/SSC Wildlife Trade Programme, September 2000; based on reports from Shahid Marjani hatchery). According to studies conducted in Iran, sexual maturity of this species in the southern shores of the Caspian Sea is attained at average ages of 17 years (from 13 to 22) for females and 13 years (from 11 to 15) for males (International Sturgeon Research Institute, 1998; cited in Dr M. Pourkazemi, *in litt*. to IUCN/SSC Wildlife Trade Programme, September 2000).

Based on catches and caviar production in the late 1970s, the rate of caviar/catch was estimated at 7% in weight for the three main commercial species of the northern Caspian Sea, *Huso huso*, *Acipenser gueldenstaedtii* and *A. stellatus* (Doroshov and Binkowski, 1985; cited in Williot and Bourguignon, 1991).

Kazakhstan: Until 1993, the mouth of the Ural River was dredged annually to allow vessels to travel upstream to Atyrau (former Gur'yev) harbour. Since 1993, this annual management of the river channel has not been carried out and is an obstacle to sturgeon migration (Anon., 2000b).

THREATS TO SURVIVAL AND DOMESTIC USE

Since the 1950s, almost all spawning rivers for this species, with the exception of the Ural River have been dammed for hydroelectric power production and almost all the spawning grounds of the Sea of Azov, the Caspian and the Black Sea region have been lost. Consequently, the species' range has been drastically reduced. In addition, pollution has been rapidly increasing since 1979, the main sources being oil, industrial waste and agricultural chemicals and almost all spawning rivers are now heavily polluted (Anon., 1997).

In the former Soviet Union and Iran, strict sturgeon fishery legislation had been in effect for decades until the emergence of the three new independent States in the Caspian Sea basin in 1992 (Azerbaijan, Kazakhstan and Turkmenistan) (De Meulenaer and Raymakers, 1996). Current information suggests that amendments of previous regulations and/or adoption of new legislation are now in effect in most new range States in the Caspian Sea, as well as in the Black Sea (including the Danube River) and the Sea of Azov basins. In the latter, Bulgaria, Romania and Ukraine are the most important sturgeon fishing nations. However, enforcement measures appear to be lacking and numerous experts as well as government officials have reported an increasing pressure of illegal fishing practices and criminal activities surrounding the caviar trade in much of

the range (Anon., 2000b; Dobbs, 1992; Doward, 2000; Evtouchenko, 1997; King, 1998; Ward, 2000a and 2000b).

Azerbaijan: The Mingechaur Dam constructed on the Kura River prevents sturgeon from accessing spawning grounds higher up the river (Birstein, 1993). *A. nudiventris*, particularly the population of the Kura River, has always been less abundant than other sturgeon species. The share of *A. nudivetnris* has never exceeded 2% of the total sturgeon catch in Azerbaijan (CITES Management Authority of Azerbaijan, *in litt*. to TRAFFIC Europe, 18 September 2000).

Bulgaria: Wild sturgeon populations have been threatened by a decrease in the number of Danube River spawning grounds as a result of human development, particularly hydroelectric facilities. The long lasting unregulated fisheries have disrupted the age composition of the populations due to the selective catch of sexually mature fish and to the incidental catch of young sturgeon in nets set to catch other species when the juveniles migrate to the sea. Water pollution has also influenced the metabolism of the Ship Sturgeon (CITES Management Authority of Bulgaria, *in litt*. to TRAFFIC Europe, 15 September 2000).

Georgia: During the fishing seasons, particularly in the coastal anchovy fisheries, numerous sturgeon fry were caught as by-catch and have perished. The estimated number of sturgeon (no species-specific data) declined from 77,000 individuals in 1977, to 57,000 in 1980 and to 27,000 in 1986. During the 1990s, illegal fishing in Georgia expanded rapidly as a result of poor control (Zarkua and Tsuladze, 1999).

Hungary: Threats to *A. nudiventris* are unknown because of the rarity of the species and very few recent records. However, the species is protected, with domestic use and trade being prohibited (CITES Management Authority of Hungary, *in litt*. to TRAFFIC Europe, 13 September 2000).

Iran: Commercial catch of *A. nudiventris* is allowed in Iranian waters.

For the past 5 years, the Iranian domestic market of caviar and sturgeon meat is estimated to be 5% and 65% of the country's total production respectively (CITES Management Authority of Iran, *in litt*. to TRAFFIC Europe, 24 September 2000).

Annual catch of *A. nudiventris* (in tonnes)

	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000 ***
A. nudiventris	1.9	22.4	19.0	17.5	17.3	15.7	16.6	13.5	19.4	21.0	3.5
Total	*2,296.3*	*2,315.1*	*2,058.0*	*1,462.1*	*1,380.9*	*1,216.3*	*1,310.0*	*1,043.5*	*1,127.9*	*923.3*	*182.4*

* Catch in spring 2000 only.
Source: CITES Management Authority of Iran, *in litt*. to TRAFFIC Europe, 24 September 2000.

Sturgeon meat and caviar production of *A. nudiventris* (tonnes)

	1992				**1999**			
	Meat	**% ***	**Caviar**	**% ***	**Meat**	**% ***	**Caviar**	**% ***
A. nudiventris	15.2	*0.9*	1.5	*0.6*	16.8	*2.3*	2.0	*2.0*
Total	**1,604.2**		**262.3**		**730.2**		**99.3**	

* Percentages relate to the share of *A. nudiventris* products of the total Iranian sturgeon fisheries.
Source: Dr M. Pourkazemi, *in litt.* to IUCN/SSC Wildlife Trade Programme, September 2000

Kazakhstan: The Ural River is susceptible to oil pollution from two oil fields (Sagers, 1994)
Both tributaries of the Aral Sea Basin have been altered for irrigation, consequently, the Aral Sea has decreased to 60-70% of its former volume (Ellis, 1990).

Annual commercial catch of *A. nudiventris* (tonnes)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 *
A. nudiventris	12.0	12.0	19.3	58.0	26.0	22.0	26.0	27.1	40.0	26.0	23.8
Total	*1,963.0*	*1,767.0*	*1,437.3*	*1,109.0*	*556.0*	*573.0*	*367.8*	*389.5*	*490.0*	*279.0*	*230.5*

* Spring catch

Source: CITES Management Authority, *in litt*. to TRAFFIC Europe, 21 September 2000

Moldova: The main threats are dam construction and poaching (Vedrashko *et al.,* 1998).

Russian Federation: The level of domestic consumption of sturgeon products in the Russian Federation is unknown, but is said to be the main outlet of illegal sturgeon fisheries (Mr Roman V. Ivakhnenko, State Fisheries Committee, pers. comm. to TRAFFIC Europe-Russia, September 2000). Based on the number of sets of illegal fishing equipment as recorded by enforcement agencies of the Caspian Sea and the Sea of Azov, the illegal sturgeon catch was estimated at six to ten times the legal catch (Anon., 2000b). In 1997, the estimated volume of the Moscow sturgeon meat market was three times the annual catch quotas for sturgeon species (Anon., 1998).

Turkey: The Yesilirmak River has changed dramatically due to the construction of two dams in 1979, the lowest of which limits upstream migration. The Kizilirmak River was dammed in 1998 and suffers significant amounts of pollution. Spawning ground has been drastically reduced (Edwards and Doroshov, 1989). From 1969 to 1979, Turkish annual sturgeon landings ranged from 10-310 t, with a yearly average of 112 t (Edwards and Doroshov, 1989). In 1989 in Samsun, a Turkish landing site on the Black Sea, a caviar processor claimed that his business had dropped from 8 tonnes/year of caviar of all sturgeon species between the 1940s and the 1970s to 200 kg/year at the end of the 1980s. In 1989, sturgeon were caught as by-catch by trawlers that operated legally along the Turkish coast at a distance greater than three nautical miles from the shore, but also illegally within the three nautical mile limit. This represented the main fishing pressure on sturgeon. In April 1989, *A. stellatus*, *A. gueldenstaedtii*, *Huso huso* and *A. sturio* were observed in Samsun. The investigators were told that *A. nudiventris* was also landed in Samsun (Edwards and Doroshov, 1989).

Ukraine: Catch of *A. nudiventris* in Ukrainian waters is prohibited since the species was listed in the Red Data Book of Ukraine in 1992 (Anon., 2000b).

INTERNATIONAL TRADE

The listing of *A. nudiventris* in CITES Appendix II entered into effect on 1 April 1998. Data for this species were therefore limited to nine months of trade (April-December 1998).

Gross exports and the comparative tabulation of trade in *A. nudiventris* are given in the Appendix. According to 1998 CITES Annual Reports, imports of *A. nudiventris* amounted to 1,156 kg of caviar that originated from three range States: Iran, Kazakhstan and the Russian Federation. Of this, 42% was declared of pre-Convention stock.

Exports of *A. nudiventris* from Russia in 1999 (kilogrammes)

	Quantity (kg)	Description	Importer	No of permits
A. nudiventris	3,000.00	Caviar	US, FR, CH	3 Re-export

Source: CITES M. A. of the Russian Federation, *in litt*. to TRAFFIC Europe, 18 Sept. 2000

For *A. nudiventris,* range States have established export quotas for caviar only.

Caviar exports quotas for 1998, 1999 and 2000 (kilogrammes)

	1998	1999	2000	
	Caviar	**Caviar**	**Caviar**	**Meat**
Kazakhstan		1,500	2,200	34,000
Turkmenistan			400	
Total		***1,500***	***2,600***	***34,000***

Source: **CITES Notification No.s 1998/35-36-61, 1999/21-47-53-68 and 2000/053-056**

Illegal trade: Confiscation of *A. nudiventris* shipments were not reported in 1998, however poaching and smuggling are closely related and have been intensively reported in the media of range States and importing countries (Mc Donald, 2000; Snyder, 2000). However, a great deal of illegally caught sturgeon is destined to the domestic market, particularly meat (Anon., 1998).

CONSERVATION MEASURES

A. nudiventris is not fully protected by legislation in the Caspian region.

Bulgaria, Romania, Russian Federation: Catch is prohibited by the Convention Concerning Fishing In The Black Sea. Bacalbasa-Dobrovici believes that measures which have been put in place are too late to aid species recovery for this species (Pr N. Bacalbasa-Dobrovici, *in litt*. to IUCN/SSC Wildlife Trade Programme, September 2000).

Azerbaijan: The State institution responsible for sturgeon fishery and processing matters is the "State Concern Azerbalyg". Commercial catch of the species is prohibited (Anon., 2000b). The species was listed in the Red Data Book of Azerbaijan in 1994. Three hatcheries were built in the Lower Kura River by the authorities of the former Soviet Union. The total annual capacity was 1-2 million fingerlings which were to be released into the river. World Bank funds have been allocated for the construction of a new sturgeon hatchery that will have the capacity of 15 million fry/year and should be operational in the next couple of years. Concerns have been raised on the availability of adult sturgeon to constitute the broodstock of the farm (CITES Management Authority of Azerbaijan, *in litt*. to TRAFFIC Europe, 18 September 2000).

Estimated number of fry released (million fish)

	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
A. nudiventris	0	0.738	0	0	0	0	0	0.123	0.410	1.120	0.870
Total	*17.523*	*9.082*	*2.980*	*1.838*	*1.142*	*1.242*	*4.070*	*6.065*	*6.220*	*20.290*	*16.965*

Source: CITES Management Authority of Azerbaijan, *in litt*. to TRAFFIC Europe, 18 September 2000

The Intergovernmental Commission for Caspian Biological Resources set a zero catch quota for the species in Azeri waters (Anon., 2000b).

Bulgaria: The fishing of *A. nudiventris* has been banned since 1985, when the species was included in the country's Red Data Book (Anon., 2000b). Conservation measures at the national level are needed, but they must be linked to the co-ordinated activities of all countries in the Black Sea region (CITES Management Authority of Bulgaria, *in litt*. to TRAFFIC Europe, 15 September 2000).

Hungary: The species has been protected since 1989 (Pintér 1991). According to Decree No. 1/1982 (III.15.) on the *Protected and Strictly Protected Species of Flora and Fauna, Value of their Specimens, Determination of the Range of Protected and Strictly Protected Caves and Exemptions from Restrictions and Prohibitions Set for Certain Protected Animal Species*, prior authorisation from the National Park Directorate is required for the: capture, killing, possession, captive breeding, introduction of specimens from exotic population, artificial exchange of genetic matter between populations, exchange, sale and

purchase of *A. nudiventris* (CITES Management Authority of Hungary, *in litt*. to TRAFFIC Europe, 13 September 2000).

Iran: Biometric measurements for all species have been carried out at all sturgeon catch stations for the past 10 years. The age, length, sex and weight of fish landed are recorded. The population structure is estimated on the basis of age groups. As a result of these studies, the number of catch stations were decreased by half, changes were adopted on sturgeon catch methods, and lower export quotas were set for the past five years.

Annual release of *A. nudiventris* fry (in million fish)

	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
A. nudiventris	0	0	0	0	0	0	0.10	0.23	0.68	0.30
Total	*4.56*	*6.60*	*3.45*	*4.17*	*5.91*	*9.13*	*12.35*	*21.63*	*24.56*	*19.10*

Source: CITES Management Authority of Iran, *in litt*. to TRAFFIC Europe, 24 September 2000

Catch of *A. nudiventris* has been restricted in Iranian waters and enforcement of the legislation has been strengthened. Use of gillnets to catch *Rutilus* spp. Roach has been prohibited as sturgeon are caught as bycatch. There has been a forced and drastic reduction in fishing effort for *Rutilus* spp. Fishermen are encouraged to offer incidental catches of all sturgeon species to the Iranian Fisheries authorities for use in their artificial breeding programmes. A restocking programme has produced over one million fingerlings that were released in the rivers leading to the Caspian Sea during 1998-1999. A broodstock shoal of about 3,000 breeders and a gene bank have been established. Egg removal by caesarean has also been practised (Dr. M. Pourkazemi, *in litt*. to IUCN/SSC Wildlife Trade Programme, September 2000).

Kazakhstan: Commercial sturgeon catch is only allowed in the tributaries of the Caspian Sea, but scientific catch is permitted in the open sea with an annual quota of 20 t.

Sturgeon fisheries are regulated by law. There are two fishing seasons, one during spring spawning and one during migration for hibernation. The dates of the fishing seasons vary with the climate and are therefore set annually by authorised scientific-research organisations. As with most former Soviet Republics, "sweep net" (bottom nets that are hauled several times a day) with a minimum mesh size and being marked with the name and address of the owner, is the only legal fishing gear for sturgeon. Each fisherman can only set one net at a time. A fishing license is required. Sturgeon fishing grounds (called "tonia") are limited; there are twelve on the Ural River and eight on the Kigach River. The minimum catch size for *A. nudiventris* is 105 cm. The ratio of males and females caught is not regulated or monitored. The purchase price at the landing site is based on a fixed legal rate of caviar weight extracted per female. *A. nudiventris* is set at 18.6% of the total body weight. The annual commercial catch quotas allocated to Kazakhstan by the Intergovernmental Commission for Caspian Biological Resources that meets annually in Astrakhan

Annual commercial catch quotas allocated to Kazakhstan (tonnes)

	1996	**1997**	**1998**	**1999**	**2000**
A. nudiventris			40	50	35
Total	***375***	***480***	***460***	***405***	***371***

Source: CITES Management Authority of Kazakhstan, *in litt.* to TRAFFIC Europe, 21 Sept. 2000

Two hatcheries exist in Kazahstan; Uralo-Atyrau and Atyurau. These have been operational since 1998.

Annual release of *A. nudiventris* fry (number of fingerlings)

	1998	**1999**	**2000**
A. nudiventris		729,000	277,800
Total	*1,706,193*	*5,318,471*	*5,507,160*

Source: CITES Management Authority of Kazakhstan, *in litt.* to TRAFFIC Europe, 21 Sept. 2000

Russian Federation: For Caspian Sea populations, the former Soviet Republics set annual catch quotas in agreement with Iran. Sturgeon catch quotas have been established by the Intergovernmental Commission

for Caspian Biological Resources for many years. The annual share of sturgeon catches of each former USSR Caspian range State as adopted by the Commission since 1993 are as follows: the Russian Federation 70%, Kazakhstan 17.6%, Azerbaijan 6.1% and Turkmenistan 6.3%. There are two fishing seasons in the Caspian Sea waters: from ice melting to 5 June, and from 1 September until the time of ice formation. A license is required to catch sturgeon in Russian waters. The minimum size limit for Ship Sturgeon caught in Russian waters is 105 cm. Russian catch quotas are declared by the Federal Government following the recommendations given by the State Fisheries Committee in consensus with an independent council of experts.

Export quotas established by the CITES Management Authority consist of 90% of the caviar production, which in turn depends on the catch quotas set for each species of sturgeon (Mr Roman V. Ivakhnenko, State Fisheries Committee, pers. comm. to TRAFFIC Europe-Russia, September 2000). The annual catch quotas or Total Allowable Catches (TACs) allocated by the State Fisheries Committee, are based on the recommendations of scientific agencies such as the Russian Federal Research Institute of Fisheries and Oceanography ("VNIRO") and the Pacific Research Institute of Fisheries and Oceanography ("TINRO"). The TAC includes the commercial catch, the scientific catch, and the catch of mature males and females destined to captive breeding.

There has been no release of *A. nudiventris* fry by Russian hatcheries in the Volga River. Recent data on the monitoring of catch per species, including the size composition and sex ratio of fish caught, are not available. The domestic consumption of sturgeon products in the Russian Federation, mostly meat and caviar, is unknown (Mr Roman V. Ivakhnenko, State Fisheries Committee, pers. comm. to TRAFFIC Europe-Russia, September 2000).

Moldova: All sturgeon fisheries are prohibited by the Law of the Republic of Moldova on Fund of Natural Areas Protected by State (1998) (Anon. 1999).

Turkey: In 1979, with the exception of *Huso huso* Beluga of more than 140 cm long, the fishery for sturgeon was prohibited in Turkish waters (Edwards and Doroshov, 1989). Circular 34/1, effective from 2000-2002, prohibits the collection of Acipenseriformes (CITES Management Authority of Turkey, *in litt*. to TRAFFIC Europe, 20 September 2000).

Turkmenistan: *A. nudiventris* was included in the country's Red Data Book in 1999 (Anon., 2000b). Commercial catch is prohibited but there are no surveys or management plans for this species (Dr. P. Salinkov, *in litt*. to IUCN/SSC Wildlife Trade Programme, September 2000).

Ukraine: Catch of *A. nudiventris* in Ukrainian waters is prohibited since the species was listed in the Red Data Book of Ukraine in 1992 (Anon., 2000b).

CAPTIVE BREEDING

In the former Soviet Union *A. nudiventris* has been bred in captivity since the 1960s in order to maintain the spawning stocks for commercial harvests of the Sea of Azov and the Caspian and Black seas. An average of 0.8 million fry were released annually into the southern Caspian Sea at the end of the 1980s. Most hatcheries of Azerbaijan, Kazakhstan and the Russian Federation, stopped being operational in the early- to mid-1990s following shortage of government funds (De Meulenaer and Raymakers, 1996).

Captive breeding is not occurring at present as there are no mature individuals available to create a broodstock. M. Hochleithner (*in litt*. to IUCN/SSC Wildlife Trade Programme, September 2000) notes that restocking projects for the non-migratory form of the species are planned.

Georgia: Up to the early 1990s, artificial breeding of sturgeon was carried out in the Varistkhi Sturgeon Plant built in 1983 on the Rioni River with mixed results (Zarkua and Tsuladze, 1999).

Hungary: There are no breeding facilities in Hungary (CITES Management Authority of Hungary, *in litt*. to TRAFFIC Europe, 13 September 2000).

Kazakhstan: The two hatcheries, Uralo-Atyrau and Atyurau, have been operational since 1998, and restocking of fry has restarted (CITES Management Authority of Kazakhstan, *in litt.* to TRAFFIC Europe, 21 September 2000).

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APPENDIX

Gross exports of *Acipenser nudiventris* 1998

TAXON	TERM	UNIT	Exporter	1998
Acipenser nudiventris	eggs		DE	44
Acipenser nudiventris	eggs	kg	AE	330
Acipenser nudiventris	eggs	kg	CH	21
Acipenser nudiventris	eggs	kg	DE	601
Acipenser nudiventris	eggs	kg	FR	154
Acipenser nudiventris	eggs	kg	IR	510

Comparative tabulation of trade in *Acipenser nudiventris* 1998

				Imports reported					Exports reported				
Year	Imp.	Exp.	Origin	Quantity	Unit	Term	P	S	Quantity	Unit	Term	P	S
1998	CH	AE	IR	330	Kg	eggs	T	W					
1998	FR	CH	IR	2	Kg	eggs	T	O	2	kg	eggs		O
1998	HK	CH	IR						9	kg	eggs		O
1998	MC	CH	IR	7	Kg	eggs	T	O	7	kg	eggs		O
1998	MX	CH	IR						2	kg	eggs		O
1998	CH	DE	RU	22	Kg	eggs	T	O	22	kg	eggs	T	O
1998	JP	DE	KZ						108	kg	eggs	T	O
1998	NO	DE	RU						6	kg	eggs	T	O
1998	US	DE	KZ	44		eggs	T	O					
1998	US	DE	KZ	43	Kg	eggs	T	O	465	kg	eggs	T	O
1998	US	DE	RU	43	Kg	eggs	T	O					
1998	CH	FR	IR	154	Kg	eggs	T	W					
1998	CH	IR		500	Kg	eggs	T	O					
1998	CH	IR		11	Kg	eggs	T	W					
			Total:	**1,156**	**Kg**								