

Internat. Rev. Hydrobiol.	87	2002	5–6	525–537
<b>I. Conservation and Broodstock Management</b>				

CAROLINE RAYMAKERS

TRAFFIC Europe Regional Office, Boulevard Emile Jacqmain 90, B-1000 Brussels, Belgium;  
e-mail: craymakers@traffic-europe.com

## International Trade in Sturgeon and Paddlefish Species – the Effect of CITES listing

*key words:* sturgeon, paddlefish, conservation, trade, fisheries, caviar

### Abstract

Since 1 April 1998, the international trade in Acipenseriformes (25 species of sturgeon and 2 paddlefish) is monitored and controlled under CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora). CITES trade data for 1998 suggest that the international trade in caviar is substantial, totalling 275 tonnes, and dominated by a few nations: 95% of the caviar is exported and imported by less than 20 countries. The 1998 world exports, as reported by CITES Parties, also included 44.6 tonnes of sturgeon meat and 0.5 million live specimens (juveniles and fertilised eggs) of sturgeon and paddlefish. Data analysis and consultation with relevant authorities and traders indicate that CITES listing of all Acipenseriformes has resulted in better monitoring and control of the international trade of these species. Range states were recommended to establish annual export quotas for specimens and products of Acipenseriformes, but the scientific bases for setting these quotas are often unclear and would benefit from verification by independent experts. This mechanism was initiated following the decision adopted in April 2000 of incorporating Acipenseriformes in the Significant Trade Review of CITES. Primary results concluded that for six species (*Acipenser gueldenstaedti*, *A. nudiiventris*, *A. schrencki*, *A. stellatus*, *Huso huso* and *H. dauricus*) the provisions of CITES were not implemented properly by range States and international trade may therefore be detrimental to the survival of wild populations. Under the Significant Trade Review CITES has the capacity to influence the conservation strategy implemented by exporting countries that are Parties to the Convention. It is an on-going process that will continue as long as the CITES forum considers that range States do not comply with CITES provisions.

### 1. Introduction

In June 1997, at the 10<sup>th</sup> meeting of the Conference of the Parties (COP 10), CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora, also known as the “Washington Convention”) addressed the dramatic world wide depletion of wild populations of Acipenseriformes (Annex 1, ref. CITES website). This situation was caused, by enlarge, to the unstable geopolitical situation in the Caspian Sea region and to the high value of caviar on the world market (DE MEULENAER and RAYMAKERS, 1996). Over 120 signatory member States (Parties) decided to list 23 species of Acipenseriformes (sturgeon and paddlefish) in Appendix II of the Convention. This decision entered into force on 1 April 1998 because they agreed to delay the effective date of the listing to allow responsible services of Parties and the private sector adequate time to adapt and prepare. Since 1 April 1998, all specimens, parts and derivatives of sturgeon and paddlefish, for instance caviar, meat, live fish and fertilised eggs, in international trade fall under the provisions of CITES. The remaining four species of Acipenseriformes were already included in the Appendices: the Atlantic sturgeon (*Acipenser oxyrinchus*) and the American paddlefish (*Polyodon*

*spathula*) in Appendix II and the Common or Baltic sturgeon (*A. sturio*) as well as the Shortnose sturgeon (*A. brevirostrum*) in Appendix I (see Annex 1).

The listing was accompanied by the adoption of Resolution Conf. 10.12 "Conservation of Sturgeons" (Acipenseriformes) that includes recommendations addressed to the members of the CITES Animals Committee, the CITES Secretariat and CITES Parties (see CITES web-site for further information). The recommendations comprise a series of measures to be taken to ensure the implementation of the listing and good management of wild populations of Acipenseriformes, including the establishment of annual export quotas for specimens, parts and derivatives of species listed in Appendix II.

An assessment of the implementation of the CITES listing of all sturgeon and paddlefish was undertaken in January 2000, after almost two years of the entry into force of COP 10<sup>th</sup> decisions, to update information on the status of and trade in these fish. The results were made available to Parties at COP 11 and assisted them in taking adequate steps for long term conservation of Acipenseriformes.

## 2. Materials and Methods

Data on catch and aquaculture production of sturgeon and paddlefish from 1984 to 1998 were analysed and the FAO Fishstat (a database of the Food Agriculture Organisation of the United Nations, ref. FAO website) was consulted to this effect.

With regard to customs data, three sources were used and analysed for this study: Eurostat (European statistics bureau for 15 European Union (EU) Member States, European Communities (EC) Commission in Brussels, the "Intra- and Extra-EU trade"), statistics of the United States Department of Commerce and statistics of the Japanese Customs.

Documents prepared and distributed by the CITES Secretariat were used. For instance Notifications to the Parties (ANON., 1998a, 1999, 2000 and 2001) were used to look at the evolution of annual export quotas set by CITES Parties from 1998 to 2001. Also, document Doc. SC.40.5.3 (ANON., 1998b), distributed at the 40<sup>th</sup> meeting of the CITES Standing Committee, was consulted in the context of the status of fisheries management regimes adopted and enforced by sturgeon and paddlefish fishing nations.

Two types of questionnaires were sent to the private sector (caviar traders and fish farms) and to the CITES Management Authority (MA) of caviar trading countries to investigate the opinion of stakeholders on the effect of CITES listing and collect specific information such as the level of seizures performed.

## 3. Results

### 3.1. Catch and Aquaculture Production

Government's reported catch figures for Acipenseriformes around the world continued to drop, from 5,723 tonnes in 1995 to 3,715 tonnes in 1998, of which 80% originate from the Caspian Sea, 14% from the North American inland and coastal waters and 6% from the Danube River, the Black Sea and the Sea of Azov (FAO Fishstat, ref. FAO website, March 2000). The aquaculture production of sturgeon and paddlefish in farms which was 160 tonnes in 1987, reached 1,142 tonnes in 1995 and had doubled in 1997 when it totalled 2,032 tonnes but the reported value of aquaculture products dropped from USD 16 kg<sup>-1</sup> in 1990 to USD 8.2 kg<sup>-1</sup> in 1997. As shown in Figure 1, 38% of the global sturgeon aquaculture production in 1997 was produced in the Russian Federation, 35% in the EU and 27% in the USA (FAO, February 2000).

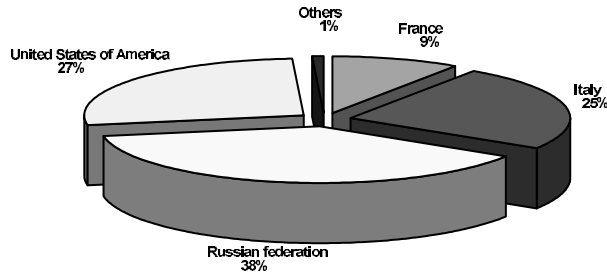


Figure 1. Sturgeon and paddlefish farming in the world in 1997 (Source: FAO, February 2000).

### 3.2. CITES Procedures

International trade in CITES Appendix II specimens requires the prior issuance of a (re-) export document by the CITES MA of the (re-)exporting Party. Certain importing nations, including EU Member States, require the issuance of an import permit (Ref. European wild-life trade regulation website). Customs officers at exporting and importing borders are supposed to control shipments together with the accompanying documents and to inform their CITES MA by returning verified, and amended when applicable, one of the three original copies of the CITES permit or certificate.

### 3.3. CITES Trade Data Collection

The CITES MA of each Party compiles, on annual basis and in a prescribed, standardised manner (ANON., 1994 and 1999), all information indicated on CITES documents, including: the scientific name of the species as included in Appendices I, II and III (Annex 1); the Appendix it belongs to; the State(s) with which such trade occurred, namely country(ies) of origin (and re-export, where applicable); the numbers or quantities and types of specimens present in each shipment – where applicable, based on the notes of the customs officer at the back of the document; the source (for example wild, ranched or captive bred) of the specimens; the purpose of the transaction (for instance commercial or scientific); and where applicable the size and sex of the specimen(s) in question (WIJNSTEKERS, 2001).

### 3.4. Reporting of CITES Data

Parties are required to prepare Annual Reports on their recorded CITES trade and to forward these reports by 31 October of the following year, at the latest, to the CITES Secretariat and/or World Conservation Monitoring Centre (WCMC) where all reports are compiled and a database is maintained for the global monitoring of the trade in CITES listed species. However, countries may postpone the submission of their report as long as the CITES Secretariat is informed of this delay. In March 2000, more than four major caviar trading nations had not yet submitted their report for 1998 and in February 2001 reports for 1999 of at least five important caviar supplying countries were not available.

Table 1. Customs records of caviar imports in the European Union (EU), Japan and the USA.

Sources: Eurostat, Japanese Customs and US Department of Commerce, 2000.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>tonnes</b>	272	293	311	383	305	326	294	283	257	263
<b>US\$/kg</b>	203	204	205	160	193	184	194	219	242	255

### 3.5. Caviar Traded Internationally

The total annual volume of caviar traded internationally, as recorded by custom services of major importing countries under the special tariff code (Harmonised System: 1604 30 10), decreased from 326 tonnes in 1995 to 263 tonnes in 1999 (Eurostat, US Department of Commerce and Japanese Customs). Customs data also suggest that caviar remains an exclusive trade commodity: the average declared import value rose from USD 184 kg<sup>-1</sup> in 1995 to USD 236 kg<sup>-1</sup> in 1998 (Table 1).

For 1998, total caviar imports recorded by customs (257 tonnes, Table 1) and through CITES monitoring (275 tonnes) only differ by 18 tonnes. The 275 tonnes reported by CITES caviar importing Parties cover the volume traded internationally from 1 April (entry into effect of the CITES listing) to 31 December 1998 (CITES Annual Reports for 1998) and include more than 15 tonnes of seized caviar. 100% of the caviar in trade was reported to be of wild source according to CITES provisions.

With regard to the various species targeted by the trade and the proportions in which they are present on the import-export market, the result of the analysis of CITES records for 1998 are represented in figure 2. It shows that Stellate sturgeon (*Acipenser stellatus*) accounted for 46% of the caviar, followed by 31% consisting of Russian sturgeon (*A. gueldenstaedti*) and by 9% (see Fig. 2) of Beluga (*Huso huso*).

In 1998, the main countries of origin of CITES monitored caviar were the Russian Federation (110 tonnes, 44%), Iran (42%) and Kazakhstan (9%) (Fig. 3). Switzerland (60 tonnes, 23%), France (18%), the USA (18%) and Germany (16%) were the main first destination of the caviar recorded in CITES trade in 1998. About 50% of the total caviar traded internationally in 1998 was imported by the EU.

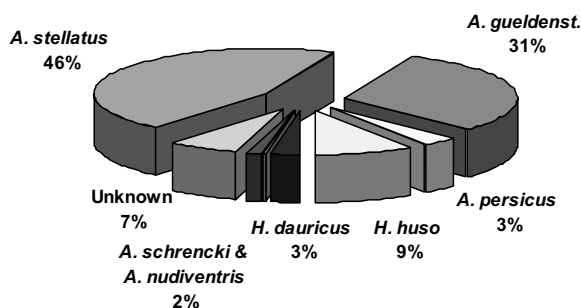


Figure 2. Sturgeon species in trade in 1998. Total volume of caviar: 275 tonnes (Source: CITES Annual Reports for 1998).

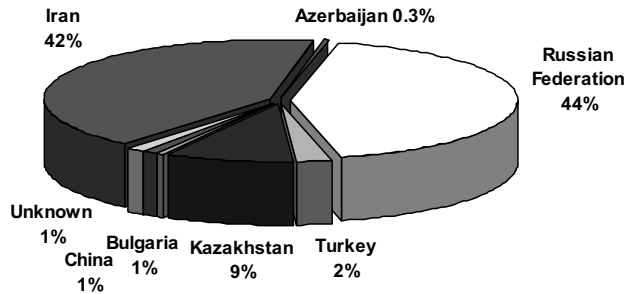


Figure 3. Origin of caviar traded in 1998. Total volume: 275 tonnes (Source: CITES Annual Reports for 1998).

### 3.6. Dubious Reports and Origin of Some Caviar Traded Illegally

Caviar reported to be of Turkish and Kyrgyz origin are probably the result of involuntary or voluntary recording or reporting errors because of the absence of significant wild sturgeon populations in these countries and no recorded aquaculture facilities with second generation specimens as defined under CITES provisions for captive bred specimens (RAYMAKERS, 1999). Custom services of 8 CITES Parties reported to have seized a total of 21.5 tonnes of caviar during 1998 and part of 1999. The main origin of caviar seized due to a violation of the Convention was the Russian Federation (72%) (Fig. 4). Only importing countries reported seizures. In most countries of origin no seizure had been performed and one CITES Management Authority responsible for Acipenseriformes species reported that this kind of customs information was not accessible.

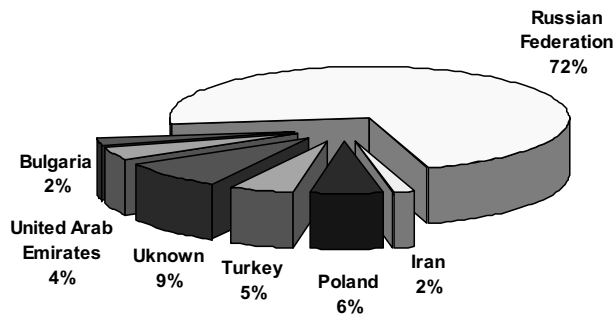


Figure 4. Countries of origin or re-export of caviar seized in 1998 and 1999. Total volume: 21.5 tonnes (Source: Custom services of 8 CITES Parties, 2000).

### 3.7. Caviar Export Quotas

The establishment of annual export quotas for specimens of Appendix II species is the responsibility of range States. A comparison of caviar export quotas for 1998 and 1999

Table 2. Export quotas established for Eurasian species of Acipenseriformes by CITES Parties (kg).

Source: Notification to the Parties No. 1998/36-56-61, 1999/21-34-47-53-68  
2000/053-056-061 and 2001/005-042.

Scientific name	Common name		1998	1999	2000	2001
<i>Acipenser baeri</i>	Siberian sturgeon	caviar	19,000	2,000	400	
<i>A. gueldenstaedti</i>	Russian sturgeon	caviar meat	79,100	66,720 53,500	60,840 142,000	40,210 161,000
<i>A. nudiventris</i>	Ship sturgeon	caviar meat		1,500	5,600	3,500 14,350
<i>A. persicus</i>	Persian sturgeon	caviar meat	45,000	53,000	38,000	51,000 140,000
<i>A. ruthenus</i>	Sterlet	caviar meat		30	300 2,000	100
<i>A. schrencki</i>	Amur sturgeon	caviar meat	5,483	4,010	4,510 4,000	4,650 4,000
<i>A. stellatus</i>	Stellate sturgeon	caviar meat	135,000	111,800 42,000	94,000 133,000	76,690 247,230
<i>H. dauricus</i>	Kaluga	caviar meat	8,587	6,930	9,430 18,000	10,430 20,000
<i>H. huso</i>	Beluga	caviar meat	12,900	16,584 15,500	21,500 56,000	18,020 156,900
<b>TOTAL (kg)</b>		<b>caviar meat</b>	<b>305,070</b>	<b>262,574 111,000</b>	<b>234,580 355,000</b>	<b>204,600 743,480</b>

reveals that for Beluga *Huso huso*, a species that is widely recognised as a highly threatened species of sturgeon (BIRSTEIN *et al.*, 1997), the quota for caviar increased from 12.9 tonnes in 1998 to 16.6 tonnes in 1999 (Table 2).

### 3.8. Caviar Traders' Opinion

A questionnaire prepared for traders and fish farmers was sent to 21 companies represented in China, Europe, Japan and North America. Thirteen answers were received, 62% return. The most interesting and common position of the private sectors was the recognition that CITES listing of sturgeon and paddlefish improved international trade controls since 1998. The following observations were made: the CITES documentation makes it easier to discriminate legal from illegal products, offers of caviar from dubious suppliers or of questionable origins have decreased and there has been greater awareness about the conservation status of the species amongst suppliers, buyers and customs officers.

### 3.9. Meat Traded Internationally

Of the 44.6 tonnes of sturgeon meat reported under CITES for 1998, 25 tonnes (56%) originated from Iran and Canada (41%). The EU and the USA, specialised in the smoking and preparation of sturgeon meat, were their major clients. Lake sturgeon (*A. fulvescens*) accounted for 40% of the trade in meat recorded by CITES Parties in 1998, 35% consisted of *H. huso* and 20% of *A. stellatus* (CITES Annual Reports for 1998).

### 3.10. Live Specimens Traded Internationally

The international trade in live specimens of sturgeon and paddlefish recorded by CITES Parties in 1998 totalled 505,000 live individuals, comprising specimens declared to be of captive bred source only. The live specimens in trade consisted of 65% fry and juvenile fish as well as 35% fertilised eggs. The species composition was reported as follows: 33% were American paddlefish (*Polyodon spathula*), 32% *A. baeri*, 15% *A. ruthenus*, 14% *A. gueldenstaedti* and 4% *A. stellatus* (CITES Annual Reports for 1998).

The USA, Canada, Hungary and Poland, in decreasing order of importance, were the main suppliers of live sturgeon specimens in 1998 (CITES Annual Reports). The USA (200,000 individuals, 31%), China (28%), Germany (17%), the Netherlands (7%), Belgium (6%), the UK (5%), and France (2%) imported most of them to meet the demand from fish farmers and from the aquarium trade.

*Polyodon spathula* was listed in CITES Appendix II in 1992 (COP 8). Large numbers of live paddlefish and fertilised eggs were recorded in the US CITES annual trade reports since 1993. From 1993 to 1997, the USA exports of *Polyodon spathula* totalled about 0.55 million live fish and 0.52 million fertilised eggs (Fig. 5).

During the same five years, China has been the major importer with at total of 0.4 million fry and fertilised eggs that originated from the USA (CITES Annual Reports 1998) (Fig. 6). In 1998, China officially imported 70,000 fertilised eggs of *Polyodon spathula* from the USA, 88% of US' 1998 exports of live *P. spathula* (CITES Annual Reports 1998).

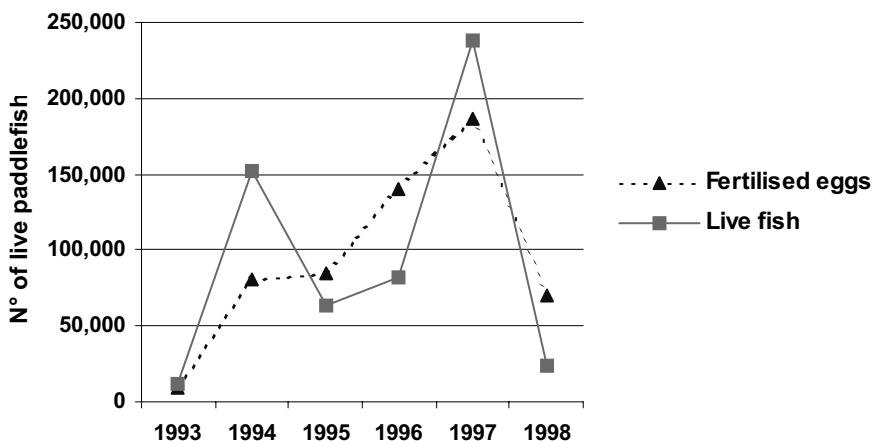


Figure 5. Live specimens of *Polyodon spathula* in trade from 1993 to 1997 (Source: CITES Annual Reports from 1993 to 1997).

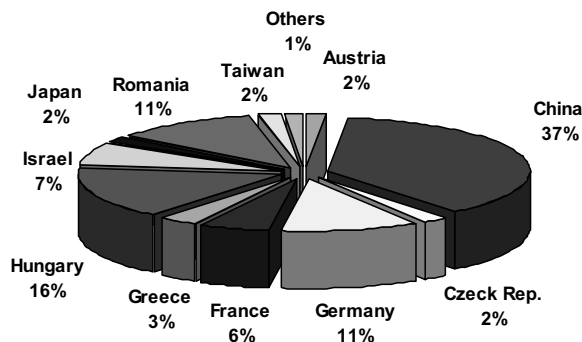


Figure 6. Destinations of live American paddlefish from 1993 to 1997. Total in five years: 1,060,000 individuals (Source: CITES Annual Reports from 1993 to 1997).

#### 4. Discussion

CITES listing of all *Acipenseriformes* has resulted in better monitoring and control of the international trade in specimens of these species. Detailed information has been collected on the species targeted for caviar, meat and other specimens, on the source of the products (wild or captive bred fish), on the growing importance of “non-caviar” commodities in trade, and on the countries of origin, destination and re-export.

##### 4.1. Comparison of Data

The levels of caviar imports recorded in CITES annual reports and by Custom services (e.g. Eurostat) of importing countries show a comforting consistency of 275 and 257 tonnes of caviar imports respectively.

The combined analysis of CITES and customs data is also important because they compile complementary information on the international trade. CITES trade data include the scientific name of species, purpose of the trade, e.g. commercial versus scientific, the source of specimens, e.g. wild versus captive-bred. In turn, caviar being a luxury food product with high import duties, Customs record include the value of caviar shipments for taxation purposes which are not incorporated in CITES data. The results of combined analyses provide comprehensive information on trends of legal markets and help investigate possible dubious operations that are unveiled by discrepancies between data. This kind of analyses can be used to describe the potential threat on wild populations induced by legal, and sometimes illegal, international trade. However, a complete set of CITES data is often available only one year or more after the trade has happened and recommendations based on their analyses may therefore be obsolete at the time they are published.

##### 4.2. Establishment of Export Quotas

Great attention was paid to the establishment of annual export quotas at the “First meeting on Conservation of Sturgeons and on Enforcement Aspects of their Inclusion in CITES Appendix II” held in Moscow from 19 to 23 January 1998 and catch and export quotas were referred to in 7 of about 40 recommendations emanating from this meeting.



Concern regarding the establishment of export quotas were related to the fact that the current status of wild populations was not always assessed and when data were available they were not necessarily taken into consideration for the establishment of export quotas. This is particularly obvious when stocks have been reported to be depleted and commercial harvest prohibited while caviar exports quotas set annually by range States since 1998 have increased steadily, e.g. Russian export quotas for Kaluga caviar (*Huso dauricus*), endemic to the Amur River, raised from 3.6 tonnes in 1998, to 6 tonnes in 2000 and 7 tonnes in 2001 (ANON., 2001).

Additionally, volumes of sturgeon and paddlefish products consumed domestically are believed to be sizeable and the harvesting for local consumption of CITES specimens must be taken into consideration in order for the range States to establish acceptable annual export quotas. However, local markets are often not monitored and sometimes unknown, e.g. in the Russian Federation (IVAKHNENKO (State Fisheries Committee), pers. com. to TRAFFIC Europe-Russia, September 2000). Surveys in Russian shops and an investigation of the suppliers and routes of the domestic market in the Russian Federation suggest that sturgeon products, particularly smoked meat, are widely available in fish markets and supermarkets from Astrakhan on the Caspian Sea to Moscow (VAISMAN, unpublished, 1997). In 1996 and 1997 for instance, it was estimated that about 10 tonnes of sturgeon meat were brought into Moscow everyday (VAISMAN, unpublished, 1997), 3,650 tonnes per year, about 3.5 times the annual catch quota established for the Russian Volga-Caspian region at that time. Similar observations were made in Baku in Azerbaijan (CAROLINE RAYMAKERS, TRAFFIC Europe, *in litt.*, 1997) and in Georgia (Tbilisi) (GESSNER, pers. comm. March 2000).

The caviar export policies of certain CITES Parties that are range States of sturgeon and paddlefish has been under the scrutiny of caviar importing nations such as the European Union. The Scientific Authorities of the EU initiated for instance a dialogue with certain caviar exporting countries to obtain better and up-to-date scientific information particularly on the status of the species in the country and on annual catch and caviar production levels. In view of the response of CITES Scientific Authorities of range States, the EU may decide to suspend importation of products and specimens of certain species. The suspension of imports can be lifted when it is fully clear that the importation from range State into the EU would not have a harmful effect on the abundance and the distribution of the species wild populations. In other words, when the non-detrimental character of caviar exports on the species concerned is justified.

Most Acipenseriformes are migratory species and one population of fish can be shared by several range States that border the same river basin. For instance Bulgaria, Moldova, Romania, Ukraine and Yugoslavia (Serbia) share the Sturgeon populations that occur in the Danube River while Azerbaijan, Iran, Kazakhstan, the Russian Federation and Turkmenistan share the Caspian Sea populations. Bearing in mind this particular aspect of the biology of Acipenseriformes, CITES Parties that exploit a common sturgeon fisheries stock were recommended to negotiate agreements on management and sustainable use of these trans-boundary resources. These neighbouring countries were also recommended to determine catch and export quotas by basin principles and sturgeon fishing nations with endemic sturgeon and paddlefish species were requested to establish quotas per basin (ANON., 1998b). A couple of these recommendations are particularly important for Kaluga (*Huso dauricus*) and the Amur Sturgeon (*Acipenser schrencki*) that are endemic species of the Amur River where they are commercially exploited by both bordering states, China and the Russian Federation. No action related to these recommendations has been reported by CITES Parties in 1998 and 1999.

### 4.3. CITES Significant Trade Review Process

When it is felt that CITES provisions are not properly implemented for fauna listed under Appendix II, and that the non-detriment impact of the catch on wild populations to supply domestic and international markets should be reviewed, Parties may decide to include the species in the Significant Trade Process. Two years after the entry into effect of the most recent CITES listing of *Acipenseriformes*, in April 2000, at CITES COP 11, 25 species of sturgeon and paddlefish listed in Appendix II were included in the Significant Trade Review. Based on TRAFFIC's assessment of the implementation of CITES listing of *Acipenseriformes* in 1998, 10 species (nine sturgeon and one paddlefish) most involved in international trade in 1998 were selected. The CITES Secretariat contracted TRAFFIC to undertake this work and start the review which was carried out in consultation with 17 countries, including two that were not Parties to CITES. The experts of the Sturgeon Specialist Group of the IUCN Species Survival Commission also participated and provided information on most sections to be covered by the review, which are: Distribution and population; Habitat and ecology; Threats to survival and domestic use; International trade (including illegal trade); Conservation measures; and Captive breeding.

In December 2000, the report was discussed by the members of the CITES Animals Committee who decided to take drastic action: six species (*Acipenser gueldenstaedti*, *A. nudi-ventris*, *A. schrencki*, *A. stellatus*, *Huso huso* and *H. dauricus*) were classified as species for which the provisions of CITES were not implemented properly by range States (e.g. Caspian Sea, Danube River and Amur River basins) and international trade may therefore be detrimental to the survival of wild populations. The four remaining species (*Acipenser baeri*, *A. fulvescens*, *A. ruthenus* and *Polyodon spathula*) were classified as species for which not enough information had been provided by range States to conclude if the Convention is implemented in a way that ensures that international trade is not detrimental to the species.

Detailed recommendations and questions about fisheries management and trade control measures must be addressed and answered. For most range States, the major problems identified are linked to the establishment of the annual catch and export quotas of sturgeon and sturgeon products. Particular gaps are related to the scarcity of data on updated accurate stock assessments for the various basins, the lack of knowledge on the effectiveness of restocking programmes and the absence of commitment to concerted regional management.

If Parties do not react before early May 2001, or if their response is considered unsatisfactory by the CITES Secretariat, the CITES Standing Committee will be in a position to recommend that CITES Parties do not accept any shipment of particular species of sturgeon from countries of concern. Range States are strongly encouraged to improve their sturgeon fisheries management and trade controls to avoid a CITES prohibition on exports of products and specimens of these species before the end of August 2001.

### 4.4. The Role of Aquaculture

Commercial production of sturgeon and paddlefish in captive breeding facilities is not an alternative to overfishing or a solution to conservation of these species in the wild (PAVLOV, 1998). The level of caviar produced in aquaculture does not currently meet the demand and production costs of meat from farms remain high compared to wild sources. The lack of wild adults of certain species may represent a limiting factor to the wide development of farming of sturgeon and paddlefish species that are not yet bred in captivity because new aquaculture facilities need to constitute a healthy and genetically diverse broodstock (WILLIOT, 1998). In extreme situations, captive broodstock may prevent the total extinction of a popu-

lation (CHEBANOV, 1998). However, to preserve intra- and inter-specific biodiversity of Acipenseriformes long term actions should focus on the restoration of river habitats, including access to spawning grounds in combination with other initiatives particularly genetic research (PAVLOV, 1998), and on a carefully monitored enhancement of wild stocks (ST. PIERRE, 1999). Also, potential risks of intensive commercial farming should be taken into consideration, including the possible loss of genetic diversity of a species (ANDREASEN, 1999). Although literature is apparently lacking on the subject, hybridisation between specimens that would have escaped from farms and specimens of remaining, sometimes endemic, wild populations should not be excluded. This risk should be better studied because it may represent a threat to species that are close to small populations of rare species of sturgeon and paddlefish, particularly in regions where aquaculture is developing fast. The Chinese paddlefish *Psephurus gladius* in China and the common or Baltic sturgeon *A. sturio* in Western Europe are examples of species that might be under such threat.

#### 4.5. Recommendations Addressed to CITES

Serious concerns remain regarding threats to wild populations by overfishing in certain range States that supply the world market of caviar and other sturgeon products. Such threats particularly relate to levels of trade, including large quantities or Acipenseriformes specimens sold on domestic markets, and to the lack of adequate fisheries management and control measures.

Based on information collected since 1998, the role of CITES can be more efficient. The following improvements are proposed,

- Request that CITES Annual Report on trade data are submitted sooner (e.g. end June of the following year instead of end October) in order to have more recent international trade data available to adjust the level of export quotas; and
- Implement the necessary measures to be able to trace back the source of sturgeon products and thereby decrease illegal trade, and subsequently poaching, through the implementation of the universal labelling system for caviar entering international trade. All trading countries should accept to extend the universal system to other specimens (e.g. meat) and to re-exports.

CITES provisions should be used to assist range States to comply with their obligations under Appendix II listing of Acipenseriformes species that are targeted by caviar trade, and prevent to the extend possible Appendix I listing, or the imposition of zero export quotas. Such measures ruin the lever that international trade partners may have on range States, while the impact of domestic consumption and poaching are not being addressed. Through the Significant Trade Process CITES has the capacity to reach beyond international trade and influence conservation strategies implemented in countries of origin that are Parties to the Convention.

### 5. Acknowledgements

Special knowledge is expressed to Prof. ROLAND BILLARD and Prof. FRANK KIRSCHBAUM who promoted the link between conservation organisations and scientists in the context of a EC project (CT 96 1005) (European Commission, INCO-COPERNICUS) and provided valuable input to the present article. All colleagues of TRAFFIC, a programme of the World Wide Fund for Nature (WWF) and The World Conservation Union (IUCN) who collaborated to this study are particularly thanked for their contribution.

## 6. References

- ANDREASEN, L., 1999: Captive propagation as a recovery tool for North American Sturgeon. – *In*: WILLIAMSON, D. F., G. W. BENZ, and C. HOOVER (eds.) Proceedings of the Symposium on the Harvest, Trade and Conservation of North American Paddlefish and Sturgeon, May 7–8, 1998, Chattanooga, TN. TRAFFIC North America/WWF, Washington, DC, USA. 121–129.
- ANONYMOUS, 1994 and 1999: Notification to the Parties No. 1999/85 (5 November 1999) on ‘Guidelines for the Preparation and Submission of CITES Annual Reports’ replacing Notification to the Parties No. 788 (10 March 1994). CITES Secretariat, Geneva.
- ANONYMOUS, 1998a and 1999: Notification to the Parties No. 1998/36, 56, 61 and No. 1999/21, 34, 47, 53, 68, No. 2000/053-056-061 and 2001/005. CITES Secretariat, Geneva.
- ANONYMOUS, 1998b: Doc. SC.40.5.3 Implementation of the Decisions of the Conference of the Parties related to species; STURGEONS. CITES Secretariat, Geneva.
- ANONYMOUS, 2001: Doc. AC. 16.7.2 – Significant Trade Review of 10 species of Acipenseriformes. CITES Secretariat, Geneva, Switzerland. 120 pp.
- BIRSTEIN, V., A. BAUER, and A. KAISER-POHLMANN (eds.), 1997: Sturgeon Stocks and Caviar Trade Workshop. IUCN, Gland, Switzerland and Cambridge, UK. viii + 88 pp.
- CHEBANOV, M., 1998: Sturgeon culture in the Sea of Azov basin: problems and prospects of a new biotechnology. Caspian Environment Program; Proceedings from the first bio-network workshop. Bordeaux, November 1997. World Bank, Washington DC: 29–42
- CITES website: [www.cites.org](http://www.cites.org)
- DE MEULENAER, T. and C. RAYMAKERS, 1996: Sturgeons of the Caspian Sea and the INTERNATIONAL TRADE IN CAVIAR. TRAFFIC INTERNATIONAL, IV + 71 Pp.
- PAVLOV, D., 1998: Access to spawning grounds and natural reproduction in Caspian Acipenseridae. Caspian Environment Program; Proceedings from the first bio-network workshop. Bordeaux, November 1997. World Bank, Washington DC: 1–9.
- EUROPEAN WILDLIFE TRADE REGULATION website: [www.wcmc.org.uk/species/trade/eu/index.html](http://www.wcmc.org.uk/species/trade/eu/index.html)
- FAO website: [www.fao.org](http://www.fao.org)
- RAYMAKERS, C., 1999: Trade in Sturgeons from the Caspian Sea. – *In*: WILLIAMSON, D. F., G. W. BENZ, and C. HOOVER (eds.) Proceedings of the Symposium on the Harvest, Trade and Conservation of North American Paddlefish and Sturgeon, May 7–8, 1998, Chattanooga, TN. TRAFFIC North America/WWF, Washington, DC, USA: 149–161.
- ST. PIERRE, R., 1999: Restoration of Atlantic sturgeon in the northeastern USA with special emphasis on culture and restocking. – *J. Appl. Ichthyol.* **15**: 180–182.
- TRAFFIC website: [www.traffic.org](http://www.traffic.org)
- VAISMAN, A., Unpublished: Sturgeon catch and trade in the Russian part of the Caspian Sea. TRAFFIC Europe-Russia, Field investigations 1997, Pp. 21.
- WINSTEEKERS, W., 2001: The Evolution of CITES. 6th Edition. CITES Secretariat, 492 pp.
- WILLIOT, P., 1998: Conservation of Caspian Sturgeon: some questions and suggestions. Caspian Environment Program; Proceedings from the first bio-network workshop. Bordeaux, November 1997. World Bank, Washington DC, 50–60.

## ANNEX 1

### BACKGROUND CITES and Acipenseriformes

- 1975: Entry into effect of CITES
- 1997: 10<sup>th</sup> meeting of the Conference of the Parties (COP 10)  
Inclusion of 23 species of sturgeon and paddlefish (Acipenseriformes)  
and adoption of Resolution Conf. 10.12 Conservation of Sturgeons
- 1 April 1998: Entry into force of the CITES listing of all Acipenseriformes in CITES  
appendices\* and the Resolution.

- March 2000:
- 150 countries are Parties (members) to CITES (Azerbaijan, Kazakhstan and Ukraine acceded to CITES after 1 April 1998)
  - about 30,000 species of plants (~65%) and animals (~35%) are listed in CITES Appendices<sup>1</sup>
- 10–20 April 2000: 11<sup>th</sup> meeting of the Conference of the Parties (COP 11), Nairobi (UNEP)  
2 years assessment of the implementation of the CITES listing of Acipenseriformes and of Resolution Conf. 10.12.
- \*Appendix I. Species that are threaten with extinction for which prohibition of international commercial trade in specimens of wild origin.
- Appendix II. Species that may become threaten unless their international trade is strictly controlled and for which international commercial trade is authorised with CITES documents: export or import permit and re-export certificates + certificate for the introduction from the sea.
- Appendix III. Species that are considered by the range State to be threaten and therefore listed under CITES to better monitor and control the international trade after having adopted special national conservation measures and eventually restrictions on the domestic trade in specimens of this species.