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Protection of Endangered Species: Sturgeon: Struggle for Survival Has Become Critical

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PROTECTION OF ENDANGERED SPECIES. STURGEON:

STRUGGLE FOR SURVIVAL HAS BECOME CRITICAL

I. Introduction

My interest in this subject was sparked by memories from my experience as a fourth grader in the secondary school I attended in Russia. I remember we had a subject entitled “The Science of Nature”. As a part of the class work we examined pictures of plants, animals and birds, wrote notes on the weather changes and studied the endangered species from the Red Book. It was not until this moment when I sat down for my current research I have realized that the Red Book was actually a locally generated list initiated as a part of international effort by the IUCN, - International Union for the Conservation of Nature. This proves that already in the 80-s despite the Cold War and rather hostile relations between the countries of the West and those of the Soviet Bloc, efforts on the international level to protect the world’s nature existed and were being implemented. I believe this is the way it should be. Political and other tensions should not get in the way of solving problems of nature protection. Unfortunately, it does not seem to be the reality in the international arena at the current stage, where during conferences of parties, states unable to concentrate less egocentrically on the solving of the problem instead seek to promote their interests and act accordingly.

Why is it important to protect the environment and in particular biodiversity? Several theories and approaches to this question exist among scientists. Some emphasize the instrumental value aspect, others (arguably a minority) consider the intrinsic value as the main element. In addition to the instrumental values that include: i) agriculture, timber, drugs and medicine; ii) tourism and recreation and iii).ecosystem services I would

like to emphasize the non-instrumental values which in my opinion are nowadays somewhat overlooked in mankind's pursuitto achieve profit.

Charles Birch, Professor of Zoology at the University of Sydney in March, 1979 said: "Living organisms are not only means but ends. In addition to their instrumental value to humans and other living organisms, they have an intrinsic value."[1] Interestingly, in his statement professor Birch talks about the intrinsic value of living organisms as an addition to the instrumental value. This, perhaps, reflects the usual approach to them as utilizable material for humans. However, the better in my opinion and even less anthropocentric approach was suggested in the Preamble of the World Charter for Nature in 1982 which reads: "Every form of life is unique, warranting respect regardless of its worth to man, and to accord other organisms such recognition, man must be guided by a moral code of conduct."[2] The key words here seem to be "regardless of its worth to man." According to this Preamble the instrumental value of nature and potential of its objects for our utilization is absolutely irrelevant in the question of protection.

The Preamble focuses on the intrinsic value. The right to exist is not dependent on the esthetic, scientific, economic or any other value of the species to mankind, rather this right is present without any context in which the species can be used by us. Paul and Ann Ehrlich in their book entitled "Extinction. The Causes and Consequences of the Disappearance of Species"[3] talk about ethics. "To our minds this is the first and foremost argument for the preservation of all nonhuman species."[4] The authors also discuss the nonhomocentric point of view offered by David Ehrenfeld, according to whom species need to be conserved "because they exist and because this existence is itself but the present expression of a continuing historical process of immense antiquity and majesty.

Long-standing existence of Nature is deemed to carry with it the unimpeachable right to continued existence." [5] Ehrenfeld says species exist parallel to us and it is our moral responsibility to exist peacefully and with respect of our co-inhabitants.[6]

Unfortunately in a lot of instances we have failed to fulfill this moral responsibility; and some species are threatened for extinction because of our own irresponsible behavior and damaging actions. One of such instances is sturgeon which is the main focus of my research.

II. (1) Basic features and characteristics of sturgeon

Due to their history and features, sturgeons represent a truly special and unique species. Being an ancient fish, they have managed to preserve their "antique" look and qualities. Sturgeons are one of the oldest types of living vertebrate on earth. [7] Having evolved 250 millions years ago and survived the disappearances of the dinosaurs, these fish are often considered 'living fossils.'[8]

The look of sturgeon takes us back to the prehistoric times. The Hudson River educator Christofer Letts expressed it in the following statement: "If you've ever had a chance to look into the eyes of a sturgeon, there are unfathomable depths there that take you back millennia; they take you back ages and ages ago. And having looked into the eyes of a sturgeon, you can fully understand that these animals swam practically unchanged from the way they are today when dinosaurs walked the earth. [9]

Sturgeon fish are clad in bony plates and have broad snouts which contribute to their unique look. They have cylindrical bodies with five rows of bony scuta, or shield-like plates. [10] Some sources also point out that sturgeon scales have been known to be hard enough to repel bullets.[11] Although the current taxonomy is debated as to the

number of species, it is usually accepted that there are twenty five species of sturgeon.[12] However, some source, like IUCN indicate as many as twenty seven. [13]

Sturgeons are very large: the length of some adult species ranges from 80 cm to over five meters. [14] The larges species called the Kaluga *Huso dauricus*, known as the largest freshwater fish, sometimes reaches over 5,6 meters in length and more than one ton in weight.[15] Some sturgeons of the larger species may live to the age exceeding 140 years.

Sturgeons are inhabitants of rivers, coastal marine waters and lakes in the temperature zones of the whole Northern Hemisphere.[16] Sturgeons either migrate upon reaching maturity from the sea to rivers for spawning with the juvenile fish returning to the sea (anadromous) or spend their whole life in freshwater. [17] Most of sturgeon species exhibit high tolerance to sharp changes in salinity, however, all species spawn only in freshwater, "pebble deposits on river beds and side channels often serving as spawning grounds." [18] High water levels in the rivers help up-stream travel of the fish thus facilitating the efficiency of sturgeon reproduction. [19]

Benthic organisms, meaning those organisms that live at the bottom of seas and lakes, including some plants are the source of food for the sturgeons. [20] Interesting morphology of the head is well adapted to the sturgeon's feeding habits: the fish's mouth being located "on the underside of a long snout and preceded by four conspicuous barbells, used to search for benthic animals such as worms, mollusks, small shrimp and insect larvae" [21] The scientists note that such kind of feeding behavior make it more difficult for the sturgeon to escape nets used in bottom- trawling and dredging as well as making it more vulnerable to the unfavorable affects of water pollutants, which can

increase particularly in benthic communities sometimes even to the dramatic point of complete food depletion sufficient to cause mass starvation among sturgeon populations.[22] Thus we should note that due to special characteristics and features of the sturgeon such as bottom aquatic level inhabitation and feeding preferences this unique ancient fish is put in great danger of pollution and bottom net fishing practices. However, there are more characteristics contributing to the threat of the sturgeon's habitat.

The bony exterior of sturgeons effectively protects them from attacks of non-human predators, but populations of this fish are exceptionally vulnerable to overfishing due to two factors. [23] One is the sturgeon's late sexual maturity age which depending on the gender and the species varies between six and twenty five years. Another reason is the limited quantity of spawning grounds.[24]

Among the most valuable and most threatened kinds of sturgeon are the three Caspian Sea sturgeon species – beluga sturgeon, Russian sturgeon (osetra) and stellate sturgeon (sevruga). These species have been recognized to produce the most delicious kinds of black caviar, therefore they are particularly sought after.

Even though sturgeon can be found in the basins of the Azov and Black Seas as well as in the reservoirs of Siberia and Far East, it is the Caspian Sea that historically has become home for the world's largest abundance of sturgeon. [25] The Caspian Sea represents an exceptional reservoir having produced in recent years up to 92% of the sturgeon fish in Russia. [26] This Sea is "the largest and most voluminous inland water body on earth…stretching for more than 1000 km from north to south in a depression between the European and Asian continental plates. [27] To the north and east of the Caspian Sea are the deserts and to the west and south are forests and grasslands. [28] Some

130 rivers supply fresh water into the Caspian, thus the level of the sea salinity being low.[29] Among the most important rivers for sturgeon is the 3530km-long Russian river Volga. It supplies a total of 75 percent of all the Caspian Sea's sturgeon catch.[30]

Stellate Sturgeon, Belugas, and Russian Sturgeons primarily reside in the northern part of the Caspian, however for the colder months starting from October the fish moves south towards the deeper areas of the Sea before mature species migrate up-river to their spawning sites in the months of spring.[31] Recently in the rivers that flow into the Caspian Sea, the sturgeons' access to their usual spawning areas had been hindered by various physical obstacles including dams and reservoirs.[32]

II. (2). Commercial craft in sturgeon in Russia and threats

The commercial trade of sturgeon in the Volga-Caspian basin is considered traditional in Russia and has a centuries-old history. [33] Centuries ago already the sturgeon was being sold on a large scale with the crafts of only one large owner reaching up to 1875 tons annually. [34] Even at that time beluga was considered rare compared with other kinds of sturgeon in the Volga River. [35] Up until the 1860-s the production of the sturgeon craft and product distribution, especially for caviar, was carried out almost exclusively to the domestic market.[36] This has to do with the fact that, even after being salted, the storage terms for caviar are extremely limited.[37] Without an efficient and rapid transportation system it simply was not feasible to transport this valuable product to any distant locations. Thus the caviar export from the Volga River across the vast territory of the Russian Empire to the Western European countries was not possible until the emergence of the railway system.[38] Only in the second half of the 1860-s the Russian caviar entered the European market following its presentation at the Russian Pavilion of

the Paris world exhibition.[39] Previously European countries received sturgeon caviar from North America and some insignificant amount of it from the states of the Low Danube.[40] Unfortunately since that time already, "the tendency to the reduction of the sturgeon breed in the Volga and the Caspian Sea was marked by the experts even at the end of the last century."[41] The reasons for depletion that the experts named included non-controllable industrial craft, poaching and fishing in the Caspian Sea on a massive scale of the young species.[42] A number of controlling authorities was established; among them were the state police and the special guards, kept there at the expense of the craft owners.[43] The crafts owners possessed the same rights as police and struggled against the poachers together with state authorities.[44]

However, since the 1860-s, the situation not only had not improved, but in fact only gotten worse. Nowadays, all the species of sturgeon and their close relatives, paddlefish, are undergoing a sharp decline and are on the verge of extinction. Particularly alarming is the situation in the Caspian Sea with regards to the beluga sturgeon. The disturbing statistics reveal that populations of beluga have dramatically declined – by more than 90 percent over the past twenty years.[45] The scientists, workers and other experts agree that in two years the number of sturgeon will reach such a low point that the craft of sturgeon fishing will no longer be possible. Several sturgeon species are now facing imminent extinction.[46]

II. (3) Current situation and reasons for depletion.

Ironically the main reasons for the most catastrophic of the sturgeon species depletion are mainly the same reasons that threatened the ancient fish in the second half of the XIX century.

The first set of issues associated with the decline of sturgeon includes overfishing and poaching. Non-controllable industrial craft – this term was used in the 1860-s describing one of the problems.[47] This seems to be a direct reference to overfishing and lack of control over the quantity of the catches. TRAFFIC in its report name the uncontrollable sea fishing as the first reason of the reduction of sturgeon stocks. Such uncontrollable fishing is accompanied by the significant fishing of sturgeon species that have not yet reached the spawning stage.[48]

After the Revolution in 1917 the new government imposed strict regulations for the entire sturgeon fishery.[49] Since 1951 it was decided to concentrate sturgeon harvesting on the lower Volga River instead of harvesting on the Caspian Sea itself.[50] Eight years later, in 1959 the government banned trawling and targeting sturgeon in the open waters of the Caspian Sea.[51] By 1962 sea fishing of sturgeon was completely forbidden.[52] Between then and 1991, the year when the Soviet Union ceased to exist, sturgeons could only be taken as by-catch in the sea. [53] A set of special measures was implemented by the Soviet Union in order to regulate the catching of sturgeon.[54] During the peak seasons of the sturgeon fishery fishing was allowed for a period of ten days followed by another ten days of no fishing.[55] The fishing nets were not allowed to touch the bottom and sides of the river so that juveniles migrating to the sea would be able to escape the nets; thus destruction of the benthic communities was prevented.[56] Trawling was not allowed and all the fish caught was immediately checked; then all the male and immature female species were returned to the water.[57]

Mature female fish "were transferred to one of five factory boats moored in the Volga delta, close to the fishing grounds, for extraction of their oocytes. Despite the

existing control system and effective state regulation the authorities initiated artificial reproduction and stock enhancement programs for Beluga, Russian and Stellate Sturgeons in hatcheries along the Volga River. The technologies used by these hatcheries were considered a state secret and kept undisclosed. The scientists believe that "these management tactics greatly benefited Caspian sturgeon populations."[58]

Even though the poachers existed already in the Soviet era, the researchers point out that "up until the early1990-s illegal catch seems to have been limited in scale…"[59] Indeed, the USSR demonstrated a firm and strict policy and adherence to the regulations. Poachers and other violators feared punishment and a majority of the population were reluctant to violate the imposed regulations.

However, the collapse of the Soviet Union at the end of 1992 drastically changed the situation. Theoretically, the laws regulating fishing and the functioning of the Volga fisheries remained unchanged: trawling is prohibited.[60] However, in the absence of their own fisheries and regulations, the former republics found themselves in a more difficult situation.[61] Due to the lack of clear legislation and regulations sturgeon fishing has resumed at sea and as some authors point out "it is common to observe nets and trawlers in the Caspian Sea, while poachers are proliferating and operate openly."[62] Similar problems exit in the territory of the Russian Federation. Although the rules still exist, like with all other laws and regulations, there is a noticeable lack of centralized control to provide the strict enforcement of the existing laws. This is true not only for sturgeon fishing, but for all other spheres of life. The experts note that in 1995 illegal catch accounted for approximately 90% of all sturgeons caught in the Northern Caspian

basin.[63] Some suggest that "in the Volga River poachers withdraw the quantity of sturgeon as a minimum equal to the quote established for legal commercial use"[64]

The TRAFFIC report mentions that all coastal population in Dagestan is involved in an illegal craft of the sturgeons and their processing.[65] The violators include both individual poachers and organized groups which tend to be protected by the highest government officials who in turn get their share in the illegal fishing business.[66] The poachers bribe the guards and militia and continue their illegal poaching activities openly without fearing punishment.[67] The poachers that are caught are usually those individual violators who did not pay off in time.[68]

As the authors of the TRAFFIC report indicate "Thus it is necessary to understand clearly, that, despite the wide powers given to the workers of organizations of fish guard, at existing rather mediocre technical equipment and low salaries of the inspectors on the one hand, and financial power of local illegal caviar structures and their penetration into echelons of authority, with another, at mass corruption of fish-guards and water militia on the Low Volga and over the Caspian Sea, the struggle is poorly effective" [69] TRAFFIC's report revealed an interesting table indicating the dynamics of offenses connected with fishing sturgeon in the Volga-Caspian basin in 1991-1995. [70]

Years	The number of open offences	Withdrawn from the infringers of sturgeon (tons)	Withdrawn from the infringers of caviar (tons)	Punished infringers
1991	5300	42,70	6,1	500
1992	5100	53,10	12, 0	499
1993	4600	72, 0	12, 6	420
1994	5200	173, 1	9, 4	535
1995	5400	288, 0	12, 2	797

And even though the data provided in the table is not the most recent, the chart reveals the tendency of a stable increase in the number of open offenses per year without any parallel increase in the number of punished infringers. On contrary, the increases in the amount of punished infringers are rather random and do not indicate any particular pattern of a stable increase.

It also looks like the figure indicating amounts of caviar withdrawn from infringers is stably declining. However, there is little reason to believe that this happens because of the actual decrease in the illegal caviar trade. Rather this is an indication of a badly corrupted system, where the caviar is not beingconfiscated from the infringers; and violators get away and moreover keep the illegally obtained valuable product. Does it suggest increased bribing and corruption within the system of state authorities responsible for fisheries regulations? Perhaps.

Another alarming factor is that during the OMON ('detachment of police for special assignments'), or special forces operations in the Caspian Sea, fisheries and patrol groups confiscate not only fish and caviar but also large quantities of illegal fire-arms. This number is significantly increasing: from 142 units of confiscated illegal fire-arms in 1994 to 944 such units in 1995.[71] So it looks like illegal fishing now has taken the shape of an organized and widespread criminal activity which involves the participation of authorities, frequent practices of bribing and the use of illegal weapons.

Thus, once existing strict and efficient mechanism for control, that had protected the sturgeon population of the Caspian and other Russian seas and rivers, weakened as a result of the collapse of the Soviet Union and was subsequently replaced by a state of chaos, corruption and injustice. The most devastating issue here is that sturgeon, the

beautiful ancient fish, has become a victim of the overall disorder and the poor state of control in the country.

Another critical set of reasons for the loss of the sturgeon populations in the Caspian is the pollution of the environment and degradation and destruction of natural habitat which inevitably lead to the reduction of degree of natural reproduction and the creation of unfavorable conditions for the sturgeon. This includes changing water levels, damming and pollution.[72]

Construction of dams on the Volga River at the most vital sites for spawning of the Caspian sturgeons started already during the Soviet period in the 1950s.[73] The construction of the Hydroelectric Power Station on the River Volga reduced sturgeon's spawning places by 80% [74]. According to another source, before the construction of the Volgograd Dam in 1962, the total area of the spawning grounds for the sturgeon was 3390 hectares.[75] After the erection of the Dam some artificial spawning reefs were added, however the area for spawning habitat did not exceed 372 hectares, which is merely about one tenth of the previously existing spawning territory. [76]

Dams themselves are not the only obstructions for the sturgeons. Another physical barrier is the uptake of water for industrial and agricultural purposes from the rivers that flow into the Caspian Sea.[77] This water uptake reaches such high volume as to causing the deltas to dry which prevents adult sturgeon from reaching the sea.[78] In spite of a number of attempts of engineers to design 'sturgeon-passages' for the species to get around the dams, these efforts have not solved the problem since such passages appeared ineffective.[79]

The report prepared by the Ministry of Natural Resources and Environmental Protection if the Republic of Kazakhstan in the frames of their National Environmental Action Plan for Sustainable Development (NEAP) addresses a number of problems in the Republic.[79] The problems include the raising level of the Caspian Sea when more than 200 oilfields and oil wells were flooded threatening biological diversity as well as the overall environmental system of the Caspian Sea.[80]

The report also provides statistics on the situation regarding sturgeon fish craft in the Ural River, another river flowing from the Caspian Sea. Nowadays the Ural is the only large river entering the northern part of the Caspian Sea in which natural reproduction still occurs.[81] For the last ten years the commercial fish catch has reduced by ten times.[82] The graph showing the dynamics of sturgeon fish catching in the Ural River reveals some disturbing numbers.[83] From the figure of over 8000 tons of the annual beluga catch in 1980, the amount decreased by the year 1996 to as low as under 500 tones.[84] Despite the fact that the Ural River did not suffer any hydroelectric dams, as much as 50% of spawning grounds were lost there because of sedimentation and pollution.[85]

In particular, historically established harvesting methods of the Soviet collective farms included practices of depositing fertilizers and pesticides, contributing to the pollution of the Ural River waters. [86] Water pollution is another one of the eminent threats that sturgeon are currently facing. "Pollution from oil and industrial sewage output have caused serious degradation of the water quality and of the benthos (the flora and fauna living at the bottom of a lake or sea), essential sturgeon food."[87] According to the NEAP report from Kazakhstan, the region surrounding the Ural River is substantially

industrialized with steel mills; where the mining operations conducted on the wide scale cause metal concentrations of Ferrum, Cuprum, and Zink in the Ural River leading to increases of these figures to the threatening levels.[88]

Azerbaijan, located to the south-west of the Caspian Sea, also contributes to the petrochemical pollution of the waters.[89] As early as in 1985 surveys conducted by the scientists in the Soviet Union reflected the negative effect on sturgeon reproduction in the Caspian Sea due to the pollution from oil products and heavy metals.[90] For the period of twelve years from 1980 until 1992 the content of copper in the Volga River increased by 11.5 times, zinc – by 9.8 times, lead and cadmium- by 4.9 times.[91]

By 1989 the Caspian Sea accumulated substantial concentrations of phenols, pesticides and surface active agents; with the concentration of petroleum products in the northern part of the Sea exceeding by nine times the maximum amount allowed by the Government. [92] As a result of this substantial water pollution sturgeon started to exhibit signs of anomalities. By 1984 the first specimens of Russian sturgeon with degenerated muscles started to appear in the Volga River as well as in the Caspian Sea. [93] In 1987 muscle degeneration and mass starvation were noted on a large scale among all of the three species – Beluga, Russian and Stellate Sturgeon.[94] Scientists began to research the phenomena of muscle atrophy and came to conclusion that "fibrils of the striated muscle tissues degenerated and were replaced by fat and connective tissues."[95]

The researchers suggested that such muscle atrophy was "caused by cumulative toxicosis resulting from increasing pollution levels in the Caspian Sea basin."[96] In particular it is such common oil products as diesel fuel that usually lead to anomalities in muscles of the juvenile specimen of sturgeon. [97]

Even though in recent years most of the polluting industries and factories in the Caspian Sea region shut down, causing some decline in the incidence of muscle atrophy, there has not been any substantial improvement in the environmental conditions for the sturgeons to escape the threat of habitat degradation.[98]

The intense pollution and water contamination of the past had cast its negative effect on the present species and some scientific data is truly devastating. In particular, the specialists of the Russian Academy of Sciences reported that 100% of the mature sturgeon oocytes from the fish in the Volga River collected in 1990 had "various anomalies" and that "all the eggs were deformed."[99] In addition, "foreign inclusions were noted in almost all eggs under the membranes and between them and the yolk granules."[100] The researchers announced that unless the quality of the water improved significantly in the nearest future, reproduction rates of sturgeon fish would continue declining resulting in the total extinction of the sturgeon in the Caspian.[101]

Thus even in the absence of overfishing and poaching, the position of sturgeon would be far from favorable. At the present moment we are faced with the following major problems – overfishing, poaching, and habitat destruction of the sturgeon. Some of these issues, like pollution, have been steadily increasing throughout the history during the existence of the USSR. Others, like poaching, had reached this troubling high degree only after 1991. Therefore, in order to improve the conditions for sturgeon and ensure their survival, it is crucial for our generations to carry out systematic attempts which would address all of the above issues. I will include my suggestions on such efforts in the concluding chapters, but first I would like to consider the question of international and local developments and efforts that have been carried out up to this day.

II. (4). Efforts and Developments

The CITES listing first mentioned species of sturgeon in 1975 when *Acipenser brevirostrum*, or the Shortnose sturgeon was included in Appendix I. At the same time two other species, *Acipenser fulvescens* (Lake sturgeon) and *Acipenser oxyrhynchus* (Atlantic sturgeon) were listed in Appendix II and Appendix I accordingly.[102] With the subsequent addition of the European Sturgeon, by 1989 four species were listed in the CITES.[103] At the Tenth Conference of Parties that took place in 1997, Germany and the United Stated suggested to list 23 species of sturgeon in Appendix II. This initiative received the support of the majority and the proposal was approved by consensus thus leading to the listing of all sturgeon species in the CITES.[104] The listing entered into force on April 1 1998 in order to allow Parties some time to introduce control and managing plans prior to the implementation of the listing.[105]

Parallel to the listing, the parties adopted a Resolution entitled "Conservation of Sturgeons."[106] In this Resolution[107] the Conference of the Parties to the Convention urged the range states of sturgeon species to 1). encourage scientific research especially in Eurasia with the purpose of promoting the sustainability of sturgeon fisheries through management programs; 2) restrain illegal fishing as well as export of sturgeon through by improving the enforcement of existing laws regulating the work of fisheries and export in close contact with the CITES Secretariat, Interpol and the World Customs Organization; 3). Search for means to enhance the participation of representatives of all agencies that are responsible for sturgeon fisheries in conservation and sustainable-use programs for the species; 4) promote regional agreements between range States of sturgeon species aiming at proper management and sustainable exploitation of sturgeon fish. [108]

The recommendations to the parties included: providing the CITES Secretariat with the documents on local legislation on sturgeon and connected with the export of personal property, submission of the list of all legal exporters of sturgeon and related products, enhancing control of the sturgeon specimen unloading.[109] Other proposals included: ensuring cooperation with all other relevant agencies in attempts to establish the efficient organization and scientific and control mechanisms necessary for implementation of the Convention provision regarding sturgeon and any projects directed at conservation of sturgeon species, considering introduction of a 250 gram per person limit as caviar exemption under CITES article VII, monitoring the storage, processing and packaging of the sturgeons in the customs and other free zones.[110]

The Resolution also recommended that the Secretariat in cooperation with the Animals Committee explore marking systems for sturgeon products, and "that the Animal Committee consider sturgeons under the review of Significant Trade."[110] Such review produced primary and secondary recommendations concerning ten sturgeon species. These recommendations were subsequently communicated to the States in February 2001. In June 2001 at the Paris meeting, the Committee agreed on the recommendations of the Secretariat for Caspian sea stocks of The Russian sturgeon, Stellate Sturgeon and Beluga, - three of the most endangered species. [112] The result of this cooperation was the Paris Agreement where four Caspian states, - Russian Federation, Azerbaijan, Kazakhstan and Turkmenistan committed themselves to a series of urgent measures aimed at addressing alarm over plummeting sturgeon stocks. [113] Significantly, Turkmenistan, the only Caspian state non-party of the CITES still agreed to cooperate on a large scale and carry out some of the agreed upon actions.

The measures included further export restrictions, suspension of all commercial harvesting for the remainder of 2001, significant increase in efforts to fight illegal harvesting and trade. [114]

However, in March 2004 TRAFFIC expressed concerns regarding methodology used to assess sturgeon stocks in the Caspian. It is possible that despite the announcement of its serious international commitments for sturgeon preservation, the four countries simply were not able to overcome the state of chaos and corruption in the conditions of an unstable economy and the overall impoverishment of the population. This suggestion is supported by the statement by Caroline Raymakers, the regional director of TRAFFIC monitoring trade in endangered species. [115] She indicated that enforcement of existing laws is one of the great problems in the Caspian region. "Laws are very difficult to enforce, because it is hard to have [guard] patrols on the sea, everywhere and at all times," claimed Raymakers. "So long as you do have these very poor economic conditions around the Caspian Sea, it's very difficult to struggle against poaching." [116] She also mentioned another major issue, - the extent of corruption describing it as reaching "very high levels"[117]

Meanwhile, in April 2004, the US Fish and Wildlife Service listed beluga as a threatened species, although it has postponed any actions to protect the sturgeon for another six months.[118] Environmentalists expressed their disagreement with this delay noting that it is essential to impose an immediate and long-lasting ban on beluga caviar imports by the United States, - the number one caviar consumer in the world.[119] One of the leading scientists in the field [120] explained that a ban imposed only six months later

will not be able to protect sturgeon this year, because "most of the fishing season will be over by then."[121]

The Bern Convention, also known as Convention on Conservation of European Wildlife and Natural Habitats listed Stellate Sturgeon and Beluga in Appendix II requiring to take measures and insure protection for the species.[122] Such measures consist of introducing closed seasons and other restriction on the exploitation, prohibition of exploitation, and strict regulations on trade.[123]

The five Caspian states recognized the need to create an initiative on the international level among them. Although cooperation efforts had been delayed by the refusal of Azerbaijan, which still allows its fishermen to catch sturgeon in the open sea, to adhere to the proposed terms, the states were able to set up a Committee for the Conservation and Use of Biological Resources in the Caspian Sea. [123] The Committee conducts discussions targeted at a common agreement. It is aided by the Russian Ecological Academy and received financial pledges from the UN and the World Bank.[124]

The threat to sturgeon has also been regularly evaluated by the World Conservation Union, also known as IUCN. In 1996 IUCN's Red List of Threatened Animals categorized twenty seven species of sturgeon.[125] That year already the Red List indicated as many as seven species as critically endangered and two extinct (in respect to a stock of certain location, -like Adriatic Sea or Aral Sea).[126] The list is reassessed on the constant basis, and in 2004 three more species were added to the list of critically endangered.[127] The Sturgeon Specialist Group was formed in 1994. Among the main purposes of the group is assessment of the status of the sturgeon by the participating scientists. It is this group in particular that conducted an evaluation and submitted their

recommendations of all sturgeon species for the 1996 IUCN Red List. Upon discussion, this evaluation was approved at the workshop Marine Fish and the IUCN Red List of Threatened Animals in close cooperation with WWF and IUCN in London's Zoological Society within the same year. The goal of the Sturgeon Specialist Group is to "promote restoration of sturgeon species in the wild and their habitats through development and implementation of…conservation actions, including sustainable use." [128] The group also aims to communicate "the urgency and scale of conservation problems…to prevent the extinction of these valuable species…"[129] The proposed future action by the Group includes efforts to assess the effects of local management of the sturgeon habitat to conservation, re-stocking, to create a gene bank to protect the fish's biodiversity, develop a regional action plan and work with the sturgeon stakeholders.[130]

The catastrophic situation with the sturgeon, despite international commitments, programs and measures, still did not show significant signs of improvement, therefore on January 3, 2005 an international ban on the export of caviar and all products from wild sturgeon entered into force. The ban was decreed by CITES and applied only to wild sturgeon primarily from the Caspian and Black sea basins, - places where implementation and especially enforcement of strict measures seemed most problematic. [130]

In October 2005 in the frames of the European Union's two-year Caspian basin assistance program three meetings were organized in Iran. [131]

In January 2006 CITES banned export of black caviar and sturgeon products from all Caspian states requiring as a condition for reconsideration precise information about population of sturgeon and urgent measures to stop poaching.

Most recently, on April 11, 2006 CITES announced its decision to extend indefinitely global suspension of exports for caviar and sturgeon products from the Russian Federation, Kazakhstan, Azerbaijan and Turkmenistan.

In December 2005, the project coordinator for the World Wildlife Fund for Nature urged the Russians not to eat caviar this holiday season.[132]

II. (5). My Survey and Some Thoughts in its Relation

However, some families, including mine had black caviar at the holiday table. I conducted a survey attempting to see the tendency and attitude of the Russians to the issue. My respondents were twenty employed middle class Russian people. According to my survey only ten people out of twenty knew about the threat and/or the seriousness of the threat to sturgeon; two out of twenty had sturgeon on their holiday table (most respondents explained that prices for it are far from affordable), and nineteen out of twenty claimed that they would agree to give up caviar and other sturgeon-related products if the new about the seriousness of the threat (nearly extinction of some species). This survey brought me to several conclusions:

1). The public is not as informed regarding the threat to sturgeon. One of my respondents said they incidentally heard an announcement on the radio regarding the issue, however after the radio report neither the extent nor the eminence of the problem was clear. Only half of the respondents actually knew about the threat, some of them claiming that they "had some vague idea" or heard something about the issue. So, it looks like the mass media in Russia failed to communicate about the danger on an adequate scale to the audience.

2. Sturgeon products (caviar and sliced smoked flesh) are not consumed by an overage Russian on a regular basis due to the high prices, and even the holiday season did not become an exception for the majority of families. This means that since the majority of the population had not developed a habit of regular consumption of caviar, it would not be difficult to give up this luxurious product.

3. Those people who did have the caviar as a part of their New Year's holiday supper would agree to give it up for next year. Some explained that they wanted to indulge for the last time.

I can see the possible objection to my survey: the interviewer did not select the right group for the surveying purposes by picking middle class instead of upper class. However, the upper class in the Russian Federation is currently rather small; it is a minority, and in my survey I tried to reflect the trend in society in general. This explains my selection of respondents who were able to reveal the state of affairs and perception of the majority.

II. (6) My Suggestions

The current situation with the depletion of sturgeon is so devastating and surrounded by corruption, therefore the measures I would like to propose should be carried out in accord with one another. They should be implemented as coordinated efforts, forming a particular policy. One single effort or implementation of merely one of them would not be able to aid the situation. The efficiency largely depends on the coordination of efforts.

My first proposal would be to increase significantly the punishment for poaching and declare illegal fishing as a more grave crime than it currently is. The term of

imprisonment for such violations should be increased from several months to years. Interestingly, Iran, which now has the monopoly for export of the Caspian sturgeon products, imposes prosecution by death penalty in public.[133] Police can shoot at poachers caught at sea without warnings.[134] Does that mean the Russian measures should be as harsh? Probably not. However, it would be plausible to punish poachers by deprivation of freedom for a significantly lower term. In addition to a deterring effect, this would send a clear message to the violators and indicate the firmness in policy of the state in this question.

My second suggestion is to create and enforce a strict system of control for the Caspian (and other) waters. We need to introduce frequent raids by various units of police, military, permanent guards of the sea patrol who would closely collaborate in their fight against poaching. This measure is effective if it is combined with the other series of steps. Otherwise, there is a threat of corruption, or to be exact, of its continuation.

The next measure is to address the issue of corruption through changes and rearrangements in management structure. In order to prevent future corruption of the higher inspectors and authorities we need to implement control mechanisms on all levels. These control mechanisms should not be single, but consist of several officials representing different groups. It would be plausible to engage more scientists and members of the environmental organizations in this work and give them certain supervising functions allowing random inspections at all stages.

The fourth element concentrates on information and public education. Authorities should initiate a campaign educating the citizens about the threat to the sturgeons. I

would also provide some photographs depicting the sturgeons, communicating both the ancient and unique look of these fascinating fish and showing sturgeon as innocent victims of poachers. Perhaps we would be able to find an NGO that would be willing to sponsor a short informational video clip on TV. Such a clip would run right before or after the TV commercials and include some pictures of sturgeon as well as their illegal capture. In my opinion, such video can provide an excellent educational material to the widest circles of the population and will turn most or at least, some people from unknowing and indifferent outsiders into caring and environmentally conscious citizens.

Reminiscing on my personal experience I would emphasize the importance of the class education for school children during their Nature Science or similar lessons. The earlier you raise awareness, the more motivated and conscious children will become in the future.

The fifth proposal focuses on encouragement and assistance with scientific research and programs directed at the preservation of sturgeon through the improvement of habitat and living conditions for the species. These efforts need to be performed in corroboration with many participants (organizations, businesses, government representatives) and on the international level. Such programs should include special projects on restoration and maintenance of environmentally safe conditions of the waters and surrounding territories. It is essential to carry out efforts for clean up in the contaminated areas and legislatively reaffirm intolerance towards the polluters. One of the initiatives should be dedicated to the task of creating the effective passages for the sturgeon through the dams that block their travel to the spawning sites, another - supporting the successful operation of the hatchery. When the breeding of sturgeons is

initiated at a breeding facility, such efforts should not be aimed at the future extraction of caviar, but rather at the preservation and multiplication of the species themselves. However, it is not implausible to have hatcheries where the purpose is the extraction of caviar. In connection with it, we can raise two issues : a). Practice of caviar extraction without killing should be given further consideration and research, b). It is necessary to consider alternatives to the black caviar and other products from endangered species, like beluga.

III. Conclusion

However, this point is debatable. Many researchers draw our attention to the existence of the sustainable alternatives: caviar from sturgeons at the breeding plants, artificially created caviar, caviar from species of sturgeon that are not threatened. Why may these alternatives not be good enough? If we switch to eating caviar from the non-threatened sturgeon species, then such species too will soon become endangered, or even extinct. Breeding plants will remind us that sturgeon takes such a long time for maturity (up to twenty five years) that this method would not be able to afford a remedy to the current problems and is impractical due to the severe time constraints.

The background issue is that by proposing alternatives we preserve the habit itself, the underlying hunger for caviar. And then, no matter how many delicious and fancy alternatives we create, somewhere deep inside we will still secretly crave that only irreplaceable and forbidden beluga caviar, - the quintessence of it all.

I would like to share an observation regarding common suggestions on sturgeon preservation among the authors. In the process of my research I have not been able to find authors who would propose and widely advocate changing the attitudes of the

society. Why? Is that too bold a task? Environmental groups and organizations address the question in a manner where our established habit, the need for caviar consumption, is taken for granted. People love and want to eat caviar, this is the presupposed fact which serves as a basic assumption for all suggestions. It looks like these organizations are saying: "Yes, here we are - the society guilty of eating caviar. But we must preserve the sturgeon. Let's find the alternatives, the 'safe' caviar."

This premise may not work as effectively as it may seem, because none of the suggested alternatives go to the root of the problem. On contrary, if we do discourage caviar eating habits (no longer associate caviar with luxury, but extinction instead; focus on and praise beneficial qualities of other products), chances for the survival of the endangered sturgeon, - these amazing creatures of nature, would be much higher. Such change does not happen overnight, and we should start by educating people of the dangers, condemning the violators' actions, focusing on the species themselves and their intrinsic value. Some may think that caviar *is* the intrinsic value of the sturgeon. Did we really go that far in this arrogance of humanism, using the terminology of David Ehrenfeld? [135] I hope not.

However, the situation is that we are the ones in charge here, or at least we think we are. We have already done a lot of irreparable damage to our co-inhabitants, but there must be some point for us to start doubting our omnipotence. We have to exercise our moral responsibility and not deprive sturgeon, the magical and mysterious 'dinosaur fish', of their 'unimpeachable right to continued existence."

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