

# VIENNA DECLARATION

## on Global Sturgeon Conservation

### Part II

*Acipenser gueldenstaedtii*

### Detailed recommendations on subject areas and justifications

Neu Wulmstorf (Germany), Vienna (Austria), April 12<sup>th</sup>, 2018



Presented to and discussed by the participants of the 8th International Symposium on Sturgeons (ISS 8) during the final session and finalized by correspondence through expert contributions

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## Introduction

Most of the 27 sturgeon species are highly endangered according to the IUCN Red List, while several of these species have recently reached critical status. As such, the situation calls for more coordinated and concise action to prevent the species from extinction, while at the same time, sturgeons in this context also serve as an umbrella species for other faunal elements that are affected by the same drivers. In this respect, sturgeon conservation is a synonym for the protection of the typical faunal elements, their respective habitats and communities.

Numerous international and regional (e.g. European) agreements, legislation and activities (the *Convention on Biological Diversity (CBD)*, the *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)*, the *Convention on Migratory Species of Wild Animals (CMS)*, the *Ramsar Convention on Wetlands of International Importance*, the *Bern Convention on the Conservation of European Wildlife*, the *United Nation Food and Agriculture Organization (FAO)*, the *European Union Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive)*, the *EU Water Framework Directive*, and *EU Wildlife Trade Regulations*) provide sound framework for the management and protection of endangered wildlife, including sturgeons. While the these documents set the obligations of member countries, practical implementation is impeded by lack of funding, lack of political will, or conflicting interests of other sectors interfering with the targets of the conservation strategies.

Whereas biodiversity loss is reflected in almost every habitat, freshwater habitats experience a far greater decline than most terrestrial habitats. It is challenging to conserve freshwater/aquatic habitats, their functions and their biodiversity, since they are focal areas of human settlements and serve as sinks for the landscapes. In particular, river habitats of the Northern Hemisphere are home to the most vulnerable phases of sturgeon development. As such, the strong impacts of structural and functional modification of the river basins, as well as the impacts by dams, pollution, invasive aquatic species, unsustainable gravel extractions, and water withdrawal for agricultural or industrial purposes, adversely affect the reproduction and the early life phases of sturgeons. Rivers, as well as sturgeons, often range across administrative and political boundaries thus requiring collaborative forms of shared protection.

Despite the fact that attempts to save the sturgeons have been ongoing for decades, the results clearly reveal that the effectiveness of the measures are determined by the serious limitations imposed by the adverse human impacts on populations, their habitats, and the associated ecosystems. Approaches that try to establish a compromise between short-term exploitation and subsequent stocking have been inefficient and, in many cases, have worsened the situation for the sturgeon populations in question through uncontrolled or unintentional adverse manipulation of the population characteristics. It is therefore, essential to rely on efficient *conservation measures in the natural environment of the fish (in situ)* to reduce causes of increased mortality in order to allow populations to recover on their own accord.

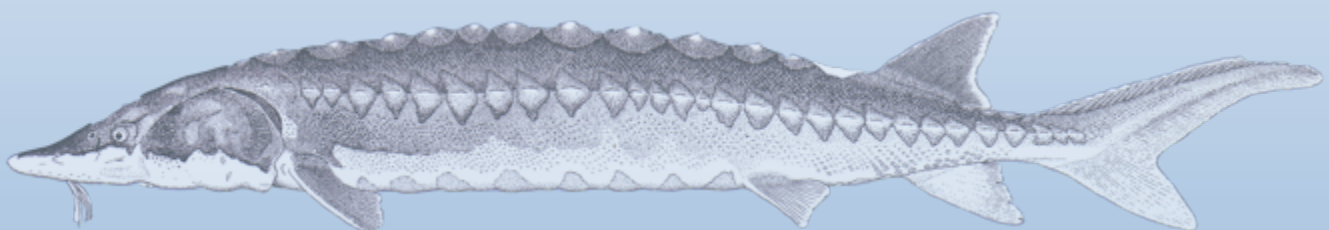


Recognizing the complexity of threats imposed upon sturgeons, the World Sturgeon Conservation Society (WSCS) published the RAMSAR DECLARATION ON GLOBAL STURGEON CONSERVATION in 2005 outlining the guiding principles for measures urgently needed to ensure the future of sturgeons, while also addressing the time horizon for proper action. Today, the international science community feels the need to re-iterate, update, and partly revise the key recommendations, while including new insights such as effects of climate change, in order to focus the attention of conservation and fisheries managers, decision-makers, as well as national and inter-governmental agencies involved in environmental protection policies, upon critical issues affecting the effectiveness of conservation management. There is a need to emphasize the need for best practices when planning or implementing activities that could have positive or negative effects on sturgeon populations. At the same time, sturgeons are excellent ambassadors for such habitat-related conservation approaches, which will evoke restrictions on the utilization of rivers, coastal and marine waters and the resources associated to them.

To meet the persisting and emerging challenges in sturgeon conservation, the 8th International Symposium on Sturgeons (ISS 8) held from September 10 to September 16, 2017 in Vienna with a participation of about 300 sturgeon specialists from 32 countries identified the following targets to:

1. protect and preserve sturgeon species as emblematic flagship or umbrella species on biodiversity conservation for future generations,
2. account for the need for long-term and adequately-resourced sturgeon conservation measures supported by improved governance frameworks,
3. protect and restore rivers as dynamic, disturbance driven systems. Their hydro morphology and ecosystem services depend upon intact functionality in terms of longitudinal and lateral connectivity as well as the ability for lateral erosion;
4. ensure that restoration and protection attempts for sturgeon populations are accompanied by effective control measures to combat fraud and illegal, unregulated and unrecorded catch and trade while at the same time supporting sustainable aqua-culture as an alternative mode of production of sturgeon commodities in high demand.

To serve these targets aiming at increased effectiveness of conservation and restoration of sturgeons, the ISS8 developed the following recommendations, which are accompanied by detailed justifications for consideration by the respective sturgeon range states, regional and international agencies dealing with species conservation.



*Acipenser oxyrinchus*



## Recommendations and Justifications

### Habitat Quality and Restoration

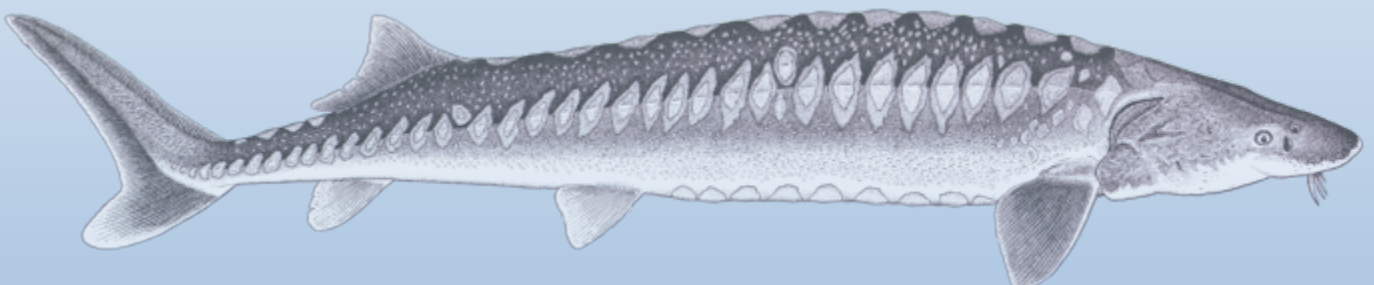
#### *Habitat protection, river regulation, flood protection, and inland navigation*

**Recommendation 1:** Recovery measures through *ex situ* conservation and re-stocking programs require urgent and vigorous *in situ* protection and habitat restoration measures: (a) all spawning habitats of Acipenseriformes must be identified and effectively protected through national and eventually international legislation; (b) the legal frameworks such as the EU Habitats Directive as well as Conventions such as RAMSAR, Biological Diversity, Bern, Oslo-Paris, Helsinki, Bucharest, and Barcelona must be fully implemented to effectively enhance the conservation status of the species through improvements of their extended habitats.

**Justification:** Despite ongoing efforts in sturgeon and paddlefish conservation in most range states, habitat destruction continues in the majority of cases due to ongoing anthropogenic pressures adversely affecting the respective food webs. Studies on ecosystem change should accompany any sturgeon rehabilitation program to understand the consequence of management decisions. Long-term trends of environmental change, partly linked to global change, require adaptive habitat improvement measures in the long-term programs for sturgeon conservation to provide multiple benefits for future generations.

**Recommendation 2:** Flood protection and inland navigation infrastructure have to be planned in an integrated fashion aiming to maintain to the greatest extent possible the natural hydrodynamics as well as to ensure connectivity and functionality of ecosystems. Infrastructure projects that have not been designed in such an integrated fashion must not be implemented.

**Justification:** Billions have been spent degrading rivers during their transformation into “waterways”, and floodplains have frequently been drowned. Mitigation measures that cost only a tiny percentage of these past investments cannot reverse the damage. However, examples demonstrate the feasibility of an integrated approach in planning and implementing such navigation and flood mitigation infrastructure. By working with nature, taking a step by step approach, and by involving conservation experts and stakeholders from the start, the need for high impact infrastructure measures can be greatly reduced through the application of alternative solutions.



*Acipenser naccarii*

### **Damming**

**Recommendation 3:** New dams on sturgeon and paddlefish rivers should not be constructed. However, if unavoidable, they must be designed with state-of-the-art mitigation measures, such as properly designed passage facilities accommodating free upstream and downstream migration of all life phases of sturgeons (adults up to several meters long as well as fragile early life phases), other faunal elements, as well as permit sediment transport. Furthermore, these measures must also protect habitats and benthic communities in the upstream and downstream sections. Design considerations must incorporate climate change effects, anticipating the dynamic changes in precipitation patterns (e.g. extreme floods and extreme droughts) over a time horizon of at least 50 to 80 years, further reducing the proportion of the flow available for energy generation.

**Justification:** Designing structures to facilitate sturgeon migration is a daunting engineering challenge not only due to the size of the facilities required. In addition, evidence is growing rapidly that precipitation patterns associated with climate change increasingly include extremes with sudden, massive rainfall, an overall substantial increase in flood levels, and substantially longer periods of droughts. This will make it even more difficult to design functioning fish migration aids that will work over a long period of time while securing viable levels of energy production. These changes will also have long-term ecological and economic effects upon hydrodam operation. These must be assessed at watershed level as to their ecological and economic consequences whenever hydro-constructions are planned. Solutions that only utilize a fraction of the hydro-potential available have been shown to produce fewer side effects upon fish populations and on hydromorphology. As such, these solutions provide a sound alternative to utilize the potential for energy production along with maintaining the ecological functionality and integrity.

**Recommendation 4:** Dams have eliminated river habitat availability for sturgeon in spawning and overwintering habitats upstream or downstream of the installations. The existing facilities have to be retrofitted with structures for effective fish protection and passage both upstream and downstream (for early life phases and adults). Other dam impacts, for instance, on sediment transport and discharge (e.g. out of season peak discharge, hydro-peaking, changes in temperature regime) require mitigation as well. Side channels with at least 30% of the flow under any conditions would massively reduce the impact of such facilities.

**Justification:** Dams as migration barriers completely eliminate access to upstream river habitat for sturgeon spawning, nursery phases and over-wintering. Furthermore, they also change the habitat quality of upstream and downstream sections. While facilitation of fish migration is a prerequisite to mitigate the most obvious adverse side effect of a migration barrier, lateral connectivity bears great importance to maintain the functions (with regard to hydromorphology, hydrodynamics, nutrient cycling and biodiversity) of the river ecosystem, including its floodplains.



*Pseudoscaphirhynchus kaufmanni*

As such, lateral connectivity requires qualified fluctuations of discharge over time to become fully functional. Continuous monitoring is required to ensure mitigation measures are performing to the degree requested and to constantly improve the design of future mitigation measures.

**Recommendation 5:** Where the construction of efficient fish passage is not viable as a result of the low capacity of the existing facilities, the removal of such facilities must be considered.

**Justification:** For old hydropower plants, the costs for the direct and indirect alterations of the environment must be considered and, therefore, mitigation measures must be implemented. Furthermore, the effect of climate change with short periods of massive rainfall and long droughts during which hydropower generation is restricted can render it more profitable to remove a facility rather than to continue to operate such systems with their massive effects on the river ecology.

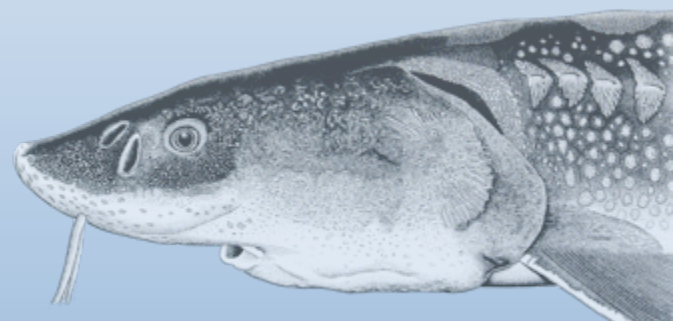
**Recommendation 6:** Prioritization of conservation and mitigation measures on sturgeon rivers should be applied at catchment level to maintain the ecological functions and to ensure the highest feasibility and the lowest adverse impact of technical infrastructure.

**Justification:** Integrated river basin management has become good practice in the water sector. It applies a holistic approach, which takes into consideration both upstream and downstream impacts of human interventions on the river. Impacts should be avoided, mitigated or compensated in that order. Compensation measures should primarily be applied near the impacted site restoring similar river structures as those being lost.

## Fisheries Management

**Recommendation 7:** Fisheries management (e.g. planning, inspection, supervision, protection, and enforcement) and other conservation actions must be properly integrated at all levels to ensure that both aspects are adequately implemented by personnel with appropriate expertise and resources, backed up by an efficient and integrated legal framework.

**Justification:** Sturgeon stock management with increasing threats gradually become an issue for conservation rather than for fisheries agencies, which in most countries implies a shift of responsibility to agencies with fewer resources. As a result, the associated obstacles can be minimized by increased inter-agency cooperation. National decision-makers must thus act to ensure proper cross-sectorial policy integration towards effective population management.



*Acipenser transmontanus*

**Recommendation 8:** The legal prerequisites of fisheries regulations must reflect the dimension that poaching imposes on conservation efforts and on populations of long-lived species. Therefore, substantial fines and/or custodian sentences have to be in place. The judiciary should be adequately informed about the context and implications of such offenses to ensure that substantial penalties are imposed.

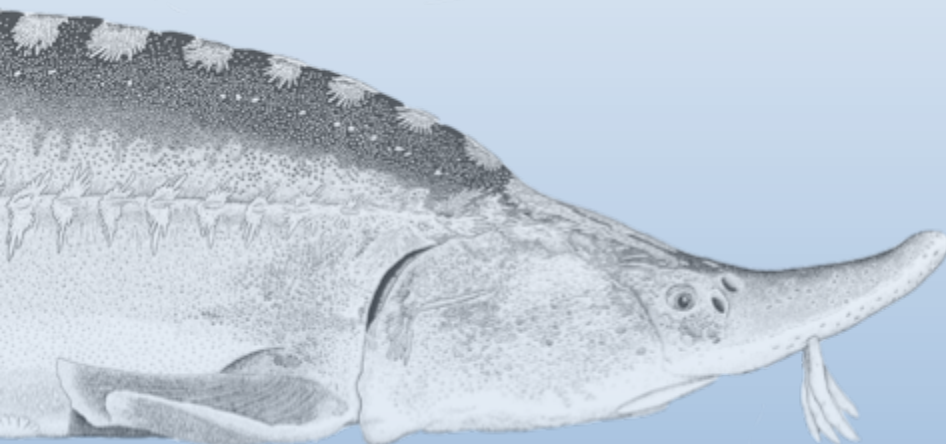
**Justification:** The illegal harvest and possession of protected animals is not a petty offense but has serious implications for conservation and restoration programs. Effective enforcement of regulations within fisheries and in trade is a vital prerequisite to successfully combat poaching and illegal wildlife trade within countries and across borders. The fines must reflect the effect of the offense on conservation efforts for the species and thus be much higher than the economic value of the specimen or their products on the black market.

**Recommendation 9:** Communities that traditionally relied on sturgeon fisheries for their livelihood have to be supported in generating alternative means of income in order to facilitate compliance with fisheries bans or harvest slots.

**Justification:** Economic alternatives help local communities to overcome transition periods during the implementation of protection measures and refute the argument that fishermen are forced into illegally poaching to support their families. It is therefore mandatory that besides effective communication of the background of conservation measures, the effects of fishing restrictions are buffered by developing alternative livelihoods. Only under such circumstances, the compliance for protection measures can be expected to increase and effective enforcement becomes possible. Politicians, administration and economic planners in many regions should place higher importance on such measures. Also greater awareness on the necessity of such initiatives needs to be more vigorously promoted in the public at large.

**Recommendation 10:** Fisheries researchers and managers are advised to rapidly develop and implement more selective harvesting methods, thereby preventing (or greatly reducing) the by-catch of sturgeons in fisheries for other target species.

**Justification:** In order to allow regional fisheries to effectively harvest any target species, it is essential to develop fishing gear that prevents sturgeons from being captured as by-catch. Despite the relative robustness of the species against capture and handling, the reduction of the encounter probability reduces the risks of physical damage due to suffocation, and stress effects. Subsequently, bacterial infections and disease risks can be reduced thereby effectively contributing to the recruitment of all age classes into the reproductive population.



*Huso huso*



## Species Survival and Repositories

**Recommendation 11:** Preparation of activities to preserve the diversity of sturgeon populations outside of their natural habitat (*ex situ* conservation to save the remaining genetic heterogeneity and to develop potential brood stocks for sturgeon species that are on the brink of extinction) must receive priority and timely support in sturgeon rehabilitation programs.

**Justification:** In order to preserve a substantial representation of the genetic diversity of a population, *ex situ* measures should be established in a timely fashion when sturgeon species or populations become classified as at-risk of extinction, and where other management measures (*in situ* conservation) taken do not immediately reverse the trend of an ongoing decline. Signs of population declines are often revealed only by long-term monitoring and are recognized only when the populations have reached crisis levels. As such, *ex situ* measures need to be taken at a sufficiently early point while the genetic diversity in the populations still allows the *ex situ* stock to represent (to the greatest extent possible) the diversity of the founder population. In several species, the population status is in continuous decline, and there is no other measure to save the species other than to immediately initiate *ex situ* measures, such as establishment of living gene banks, cryopreservation, etc. for the remaining specimens, expanding the *ex situ* stock over time. Due caution must be taken in the *ex situ* measures to maintain genetic differentiation and diversity of subpopulations.

**Recommendation 12:** Effective organization of *ex situ* stocks must be shared between range countries to reflect the joint responsibility for population management. This will also help to distribute associated costs of restoration as well as to reduce the risk of losses due to local negative events.

**Justification:** In populations with a home range that is affected by the jurisdiction of several countries, a shared approach for the responsibility of management has been introduced already following the zero commercial catch and export quota for caviar from the Caspian Sea. The responsibility and management of range states for *ex situ* stocks arises from their joint obligation for the management and restoration of a shared resource. This approach increases the potential to succeed in ensuring sufficient support for extensive programs required to re-establish the natural population structure in species that need decades to recover. Thus, the responsibility for a sound management strategy increases the stakes of the partners in the program and, as such, enhances the motivation and commitment for conservation measures. In this case, exchange of specimens to increase the genetic diversity in the individual captive stocks can be facilitated. However, such an approach requires good and effective communication between the countries and the institutions involved, utilizing a properly designed, well-structured, and jointly operated data acquisition and storage system that permits frequent updating and expansion.



*Acipenser ruthenus*



## Restocking, Recovery and Re-introduction Actions

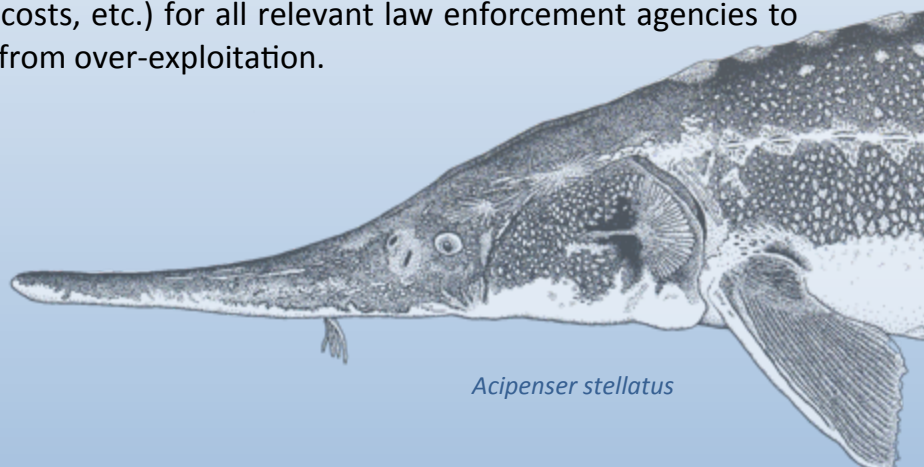
**Recommendation 13:** Stocking as a compensation measure is considered a temporary tool to overcome adverse environmental conditions causing recruitment failure or to initiate self-sustaining populations. A management structure at the national or regional level, according to the species distribution, must be established to coordinate the actions and standardize the methodologies for reproduction, rearing and release.

**Justification:** Stocking has a large potential for adverse impacts upon natural populations struggling to maintain effective minimum population size to survive. A variety of safeguarding measures are required to permit natural recovery through stocking with adequately selected founder populations. Proper source and target identification, genetic breeding plans and the production of fish with high fitness (genetically as well as physiologically) for survival in the wild is crucial to reach the target as fast as possible. *Ex situ* conservation aquaculture must be clearly distinguished from commercial aquaculture for meat and caviar production following internationally agreed guidelines. By preserving and maintaining the widest possible range of diversity at all biological levels for future generations *ex situ* conservation will represent the adaptive potential of populations in unpredictable changes of natural environments (i.e. climate change). Implementing *ex situ* measures also requires elimination or mitigation of the underlying causes for the population decline which is essential to render the measures effective and to shorten the time during which stocking is required. Thus, the ultimate goal of culture for release is to re-establish self-sustaining populations, and full success of the stocking program is achieved when release programs are no longer needed and can be terminated.

As a prerequisite to limit the stocking efforts, a consistent monitoring must be in place to document the conditions and results of the attempted measures on the different populations in order to facilitate their improvement as a continuous process of adaptive management.

## Trade Control

**Recommendation 14:** Due to the detrimental impact of uncontrolled, illegal fishing on natural populations, the illegal trade in caviar, sturgeon meat and other products from sturgeons must be a focal area of enforcement actions both nationally, regionally, and internationally. Therefore, it has to include the provision of sufficient resources (including manpower, equipment, operational costs, etc.) for all relevant law enforcement agencies to effectively prevent sturgeon species from over-exploitation.



*Acipenser stellatus*

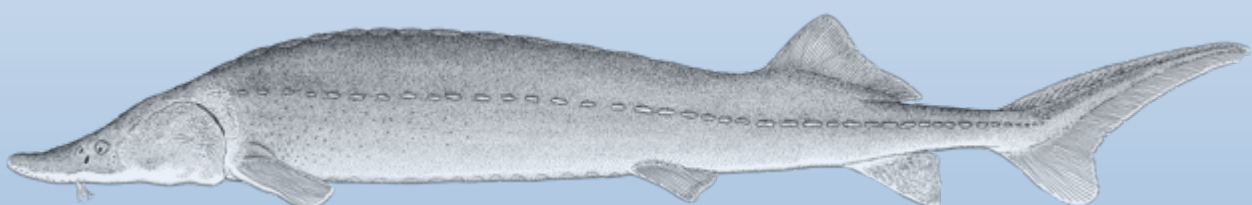
**Justification:** Illegal caviar trade is not only an issue regarding the protection of endangered sturgeons but also has wider implications. In trade, tight controls of the common markets from the producer to the retailer are necessary to effectively determine market alterations and block illegal trade channels. This requires tight controls by capable, well-trained and equipped agency staff, especially as there may be other issues at stake, including loss of taxation revenue, health and veterinary issues and the potential involvement of organized crime. Last but not least, customer awareness campaigns should be intensified to ensure that the public is informed about the illegal trade issues associated with caviar. This approach would also benefit the sustainable aquaculture production of caviar by promoting their approach to ensure customer safety.

**Recommendation 15:** Responsible national authorities (e.g. CITES scientific and management authorities, customs, food inspections, law enforcement agencies) are requested to establish formal or informal inter-agency groups (with the participation of scientific institutions, customs, police, and financial crime specialists) to develop common approaches and harmonized means of tackling illegal wildlife trade, supporting each other in the respective activities and backing up competencies in dealing with legal fraud.

**Justification:** Inter-agency coordination groups can greatly enhance the awareness and the effectiveness of the work by control agencies through frequent exchange of information, sharing experience and promoting joint operations, including asset recovery. Regular communication can help prioritize actions and focus enforcement efforts on areas of key concern, assisting in planning and carrying out joint and coordinated control campaigns, where they are urgently required. In most cases, the coordinated efforts of veterinary, food safety, and CITES enforcement agencies with customs are required to effectively combat illegal trade. Therefore, good cross-institutional cooperation both nationally and across borders, including timely information exchange, is crucial. TRAFFIC and Interpol may be called in for support. For any nation, the issue is also of wider concern as it may involve organized criminal networks.

**Recommendation 16:** Inspections in production and trade are to be carried out unannounced. They must use state-of-the-art techniques (e.g. DNA and isotope analysis) that are necessary to identify the species and origin and thereby guarantee effective monitoring of trade in caviar and other sturgeon commodities. This also needs to include caviar containers with CITES labels, as long as manipulations cannot be ruled out completely.

**Justification:** The need for random, unannounced controls was already outlined in a workshop on caviar trade in 2007 and was reiterated repeatedly in the Conference of Parties to CITES. The results of confiscations underscore the value of DNA testing in enforcement, when used in real time, since these measures can help detect the utilization of species other than labeled and can help to discourage illegal trade.



*Acipenser baerii*

**Recommendation 17:** Close cross-border coordination of enforcement actions concerning illegal trade of sturgeon products is required to cope with international criminal networks.

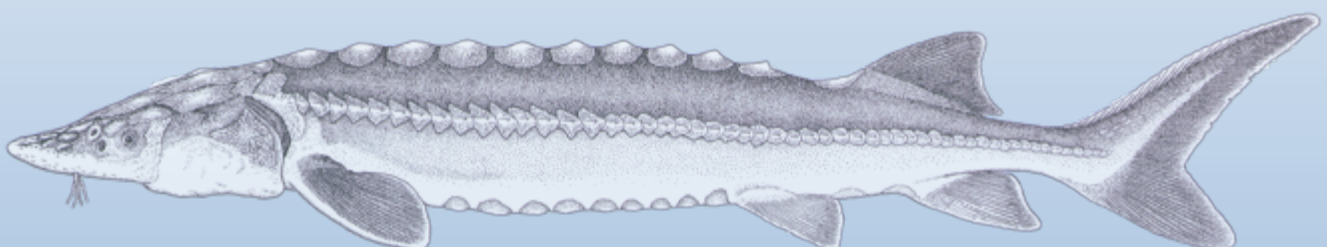
**Justification:** Illegal activities across borders are often well organized and require quick interventions to be effective. As many sturgeon stocks are shared between nations, coordination of enforcement action could be established through regular hot-line contacts and cross-border meetings accompanied by early information exchanges on planned actions and joint inspections by all agencies involved.

**Recommendation 18:** Enforcement authorities should increase their attention to the presence and authenticity of labels in line with the latest CITES labeling systems. The professional preparation and the method of application of labels must be standardized at an improved level to prevent misuse and prevent loss of labels during packaging, transport, and storage. Also, the printing quality of the CITES codes should be improved to minimize fraud.

**Justification:** CITES parties must ensure that any caviar container in production, domestic or international trade is labeled correctly, regardless of whether or not the caviar contained is produced or processed in their territory or if it is imported. The provision of certain security elements, which cannot easily be falsified (e.g. holograms) as well as the production of labels by CITES Management Authorities, could help to reduce cases of falsified labels. These labels must effectively seal containers ensuring sustained adhesion to packaging material. In addition, a compulsory standard design for CITES labels could facilitate controls for enforcement officials, as there is currently a widespread view that there is too much diversity in label layouts. Companies need to improve the quality of the print of the CITES code on the labels in terms of readability and durability (for example water proof print). Such improvements ensure the reliability and effectiveness of the labeling system.

**Recommendation 19:** To ensure full acceptance in court cases, analytical methods should be harmonized using appropriate scientific and laboratory standards, preferably with regular inter-calibration exercises between laboratories performing DNA and other investigatory analysis.

**Justification:** The application and standardization of up-to-date analytical tools in genetic identification tests is essential to achieve reliable, reproducible results which are valid in prosecutions. Institutions applying these tools could be specifically certified or accredited according to international standards. Since DNA analysis cannot differentiate wild from farmed caviar, other techniques, such as the analysis of isotopes, should be employed to verify the source and origin of products in trade.



*Acipenser dabryanus*

For both methods, standardized methodologies are to be agreed upon and bio-databanks for reference samples should be established for intercalibration. Where the recognized methodologies are available, provisions must be made to ensure that best practices are employed in enforcement. The capacity of national institutions to carry out the required tests should be investigated (including allocation of funds to cover the associated costs). If no national institution can carry out the tests, the possibility of expanding their profile for this purpose should be explored. Samples could also be analyzed in countries (most likely easily possible within EU member States) which have the relevant expertise or resources.

## Aquaculture

**Recommendation 20:** Sturgeon species produced by aquaculture operations should be routinely monitored in line with national or regional (EU) regulations as well as with regard to environmental compatibility and product safety. To identify and prevent illegal import or laundering of illegally caught fish through aquaculture, the production and trade of sturgeons requires specific monitoring and control measures within the aquaculture industry. To prevent negative interaction between farmed and natural populations/species (e.g. hybridization, disease transmission, misidentification in case of by-catch), effective measures to prevent escapement from the farms should be implemented.

**Justification:** Sturgeon aquaculture and processing provide several opportunities to launder illegal sturgeon products obtained from wild catches. Tight control of the production process in line with CITES, EU and national regulations is necessary to verify the origin and source of any products and to prevent the diffusion into legal trade. Ideally, oversight on harmonizing the regulatory procedures in caviar and meat trade from aquaculture should be undertaken by a joint committee involving most (or all) range countries which have ongoing sturgeon farming and product trading activities. Law enforcement agencies and CITES management authorities need to ensure that the produced volumes of caviar correspond with the age, number and species of sturgeons on the respective farms. Caviar sold as „captive bred“ (source code “C”) must be derived from a female of which both parents were already born in captivity, as defined by CITES. However, at present, available data on aquaculture production do not appear to be very reliable and reporting formats are subject to considerable variability due to the different agencies (veterinary, food security, CITES implementation, and eventually customs) involved in different stages of the production process. Therefore, regular collection of such information by the relevant authorities is required (preferably on an annual basis) and should be shared between agencies to enable the enforcement agencies to become active when required.



*Acipenser gueldenstaedtii*



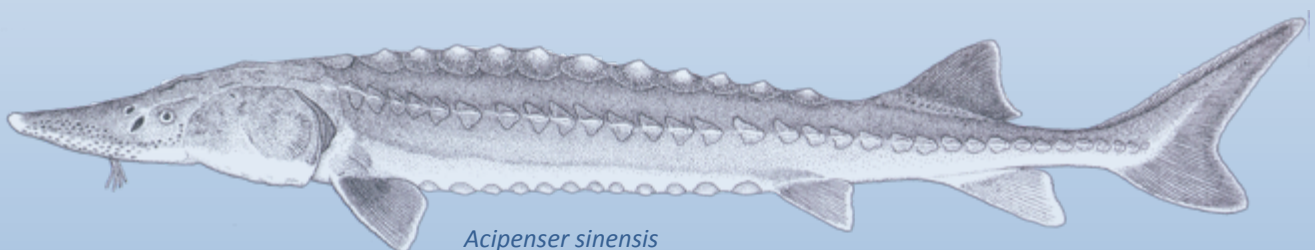
To limit escapement risk, specific regulations should be implemented on the farms, such as double grid systems in case of culture in open waters and systematic individual identification of the fish to distinguish them from wild fish at by-catch. In the case of the presence of critical wild population in the watershed, farming should be authorized only in closed systems.

**Recommendation 21:** The aquaculture industry involved in sturgeon production is strongly encouraged to collaborate in identifying tracking approaches to support enforcement authorities in trade control actions. It is suggested to establish tissue repositories identifying captive stocks to allow a more efficient and fast commercialization of legal sturgeon products.

**Justification:** The producers of caviar and sturgeon products would significantly benefit from participating actively in cooperation with the respective authorities in developing measures that allow fast and effective traceability of their products on the market. This would limit economic loss due to confiscation of caviar of uncertain/ unclear origin and would reduce the effort on behalf of the enforcement agencies, while it would also help to identify farms involved in illegal trade of wild caviar. Being directly involved with the respective agencies in tracing each processed animal to the farm of origin would include, for example, the genotyping of parental stocks or the establishment of tissue banks that can be used on demand. Such methodology developed jointly by farmers and authorities should be evaluated in terms of their effectiveness to establish accepted standard procedures.

**Recommendation 22:** Commercial farms, culturing sturgeons for consumer markets, may in exceptional cases be important partners in conservation programs to bridge the time-window until the required public infrastructure for *ex situ* conservation is in place. Those farms may become conditionally involved and receive support for maintaining publicly owned broodstock of sturgeon species at brink of extinction if the following prerequisites are fulfilled:

- (a) supervision of the rearing process is carried out under the national/regional conservation authorities implementing the sturgeon recovery programs;
- (b) the wild fish (until F2 generation) are not owned by the farm but belong to the national or regional sturgeon recovery program, and the farmer is held fully reliable for their survival and availability;
- (c) the breeders are selected for reproduction based on prior genetic analysis and an agreed upon breeding plan. The rearing of offspring is separated from production implementing the recommendations for *ex situ* rearing;
- (d) utilization of the surplus production of progeny for commercial purposes must take into consideration the demand arising from restoration programs in the catchment before commercial use is permitted in a case-by-case decision by the coordinating body.



*Acipenser sinensis*

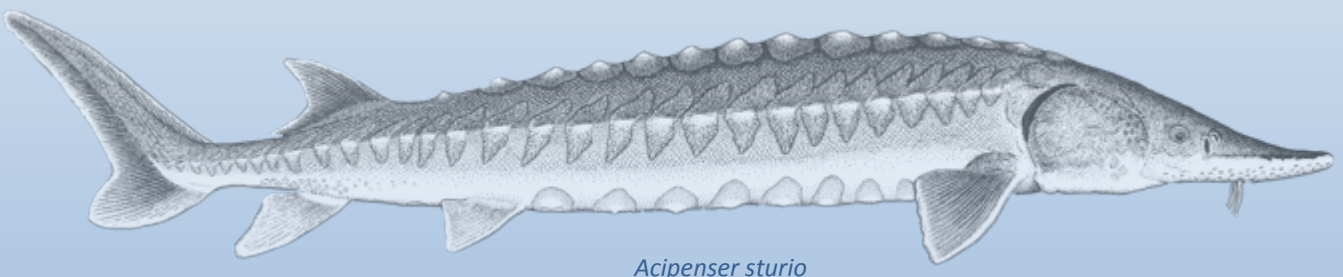
**Justification:** In some countries, the conservation programs for sturgeons have not yet reached a state where *ex situ* conservation can be immediately implemented by a public or other national/regional organization despite the fact that the species of concern is under risk of immediate extinction.

Temporary involvement of sturgeon farmers allows implementing the Recommendations 11-13 until a specific infrastructure for this purpose is in place. In order to reproduce and rear fish for release, specific rearing prerequisites needed for „culture for release“ must be implemented. Therefore, activities for conservation purposes must be performed under conditions that allow maintaining broodstocks in good conditions for very long time periods (50-80 years). Reproduction must be carried out based upon a sound breeding plan to preserve the genetic diversity of the founder population. Moreover, aquaculture for conservation requires specific infrastructure and space to meet the requirements to produce well adapted (e.g. fit) offspring. For this reason, training of personnel, supervision of activities by independent experts, and access to the fish must be guaranteed until the public infrastructure is in place.

### Policy Integration and Awareness Raising

**Recommendation 23:** Public awareness will need to be raised in order to support and push for political action towards implementation of all the above mentioned recommendations. The general public in sturgeon range countries should be made aware of the value of sturgeons to people and nature and their threat status. In particular, caviar consumers must learn how to avoid illegal products. Key stakeholders from various sectors need targeted information about sturgeon conservation. Awareness of key decision makers will have to be raised about the need for integrated policy responses and implementation of above mentioned recommendations.

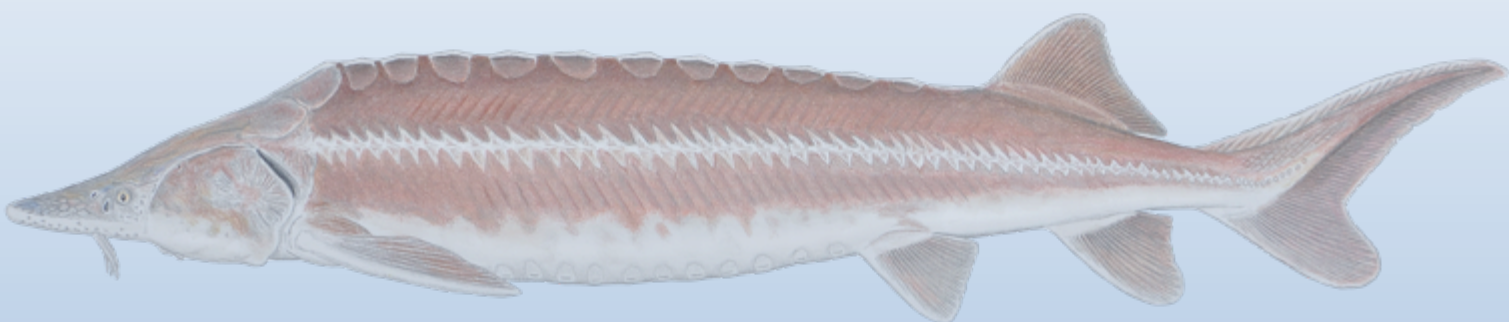
**Justification:** Addressing decision makers and creating political will is a prerequisite for adequate funding and sustainable sectorial policies. Umbrella species, such as sturgeons, require integrated policy responses, because while migrating between ecosystems, they range beyond national borders and jurisdictions while being affected by a multitude of uses. Thus policies regarding water ecology, biodiversity conservation, navigation, infrastructure planning, flood prevention, gravel extraction, by-catch, fisheries or trade regulations need cross sectorial integration. To avoid conflicts in implementation, stakeholders should be involved in the process to the degree possible when addressing sturgeons, while public involvement is essential to increase the knowledge base, participation and support for measures.



*Acipenser sturio*



**We call upon all sturgeon range states, inter-governmental, international, regional, and national agencies concerned with environmental protection, as well as on all NGOs, of countries in which sturgeons once provided a healthy bio-resource and strongly request immediate action to provide the means and resources for implementation of the above listed recommendations.**



*Acipenser nudiiventris*

