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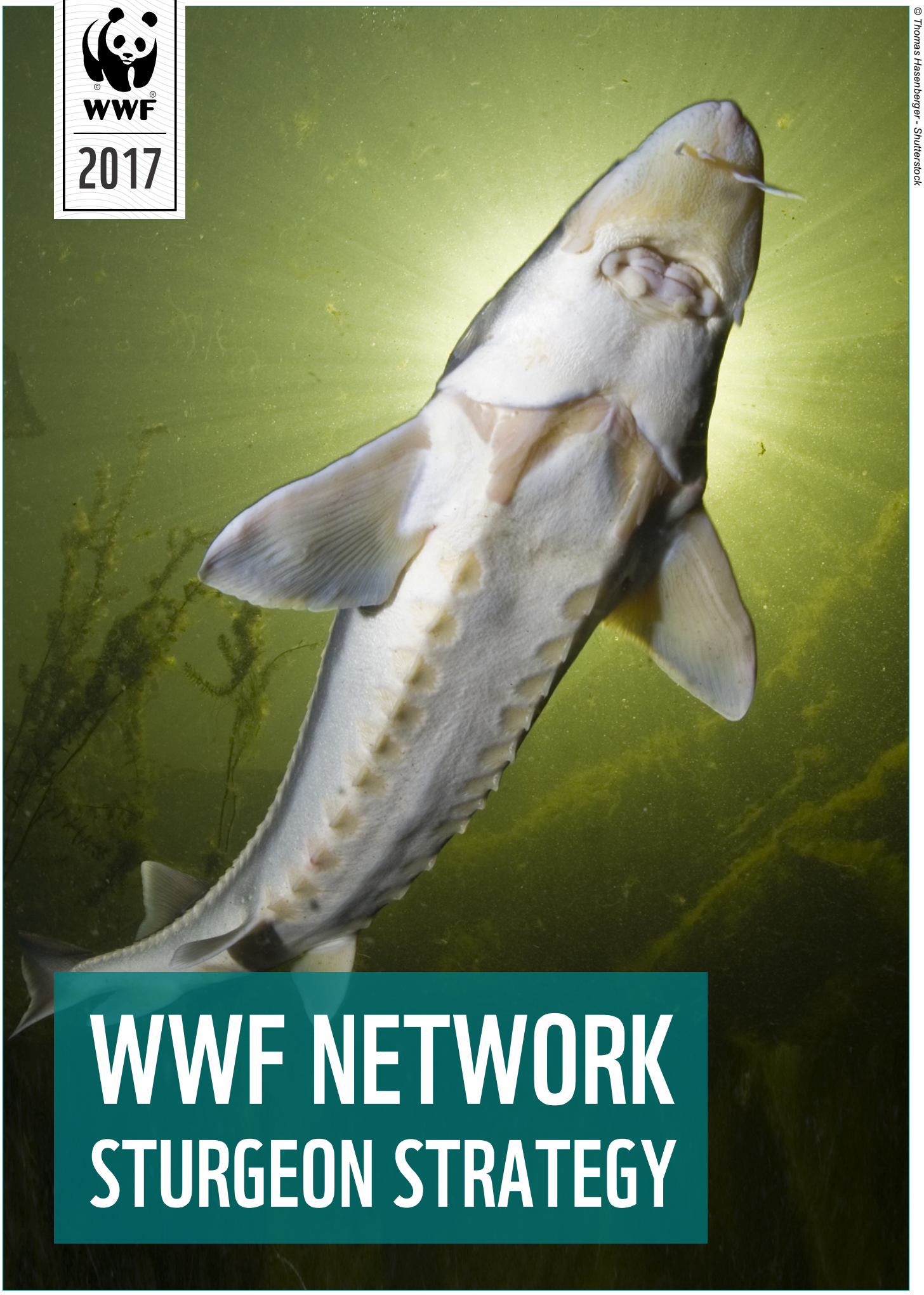

WWF NETWORK
STURGEON STRATEGY

together possible®

The document is a joint effort of the WWF network and its partners.

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WWF is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global Network active in more than 100 countries.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by: conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

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WWF is one of the world's leading independent environmental organizations with 5 million volunteers and a global network, which operates in more than 100 countries. WWF's team in the Danube-Carpathian region is responsible for leading and implementing WWF's efforts to preserve, restore and sustainably manage the natural values of the Danube-Carpathian ecoregions. The team works across political borders developing model projects, influencing policy, capacity building, raising awareness and seeking solutions to the challenges that the region faces in order to ensure prosperity, sustainability and biodiversity conservation.

PREAMBLE

Sturgeons are an ancient and fascinating, yet highly endangered group of fish due to overexploitation, blocked migration routes and other pressures such as habitat loss, pollution and climate change impacts. Of the 27 Acipenseriformes species, 85% are now on the brink of extinction with 63% (17 species) listed in IUCN's Red List as "Critically Endangered" and four species even being "Possibly Extinct". Dramatic decline is mostly attributed to the last 50 years and now continues to progress exponentially. At the same time, measures for safeguarding sturgeons will also benefit other species sharing their habitats, as sturgeons could be considered umbrella species for river and sea ecosystems and communities.

85% OF ACIPENSERIFORMES ARE ON THE BRINK OF EXTINCTION

Due to the common and transboundary nature of threats, possible impact on sturgeon conservation would be much stronger, if WWF network efforts around the world were aligned to the focus of a common strategy. Therefore, interested WWF offices/programmes came together to produce this draft for a WWF Network Sturgeon Strategy, which aims to foster synergies and cooperation. The outcomes proposed here will help to bring resources together in a synergistic way and achieve critical contributions to planned global network outcomes 2025 of the newly established WWF Freshwater and Wildlife Practices.

In order to use resources effectively, focusing of WWF efforts was made through a prioritisation of key rivers and seas. This prioritisation roughly reflects population status and the resulting need for action, but also takes into account main WWF network interest and capacity as well as chances for conservation success.

The international scientific community, including the World Sturgeon Conservation Society, IUCN, and independently working experts must be involved in shaping WWF´s knowledge-based strategies. For example, IUCN status assessments for sturgeon populations worldwide are considered as a background for WWF Network global priorities setting.

International efforts to secure these charismatic species are already in place and include the Ramsar Declaration on Global Sturgeon Conservation [13], the "Sturgeon 2020" program for Danube sturgeons [12], as well as international Action Plans (such as the Action Plan for the Conservation of the Sturgeons in the Danube River Basin [3], Final Recovery Plan [15] for the Shortnose Sturgeon or others) and Forums (like Tennessee Lake Sturgeon Working Group or Danube Sturgeon Task Force) and the Action Plan for the conservation and restoration of the European Sturgeon under the Bern Convention. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulates the trade of sturgeon products. Thus WWF efforts will aim at supporting and complementing these initiatives whenever possible.

A successful Strategy will have to rely on strong partnerships both within the WWF family and with other global conservation players.

EXECUTIVE SUMMARY

Sturgeons are an ancient and fascinating, yet highly endangered group of fish. They are threatened by:

1) **Overexploitation** stemming from IUU fishing[1] and improper fishery management since sturgeon meat and especially caviar are very valuable products.

2) **Blocked migration routes** through dams and **loss of habitat** originating from the development of various forms of river infrastructure such as navigation, hydropower and flood protection.

3) **Other negative impacts** like pollution, fish kills[2], the Allee effect, siltation as well as effects of climate change on water level, flow regime and temperature.

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Due to the common and transboundary nature of threats on sturgeons, a common global strategy increases conservation impact of WWF´s conservation work through sharing of knowledge and experience, resources, synergizing and cooperative transboundary work streams. A joint initiative additionally attracts and enables cooperation with important strategic regional and international partners in sturgeon conservation.

The following Global Sturgeon Strategy is based on a Sturgeon workshop, organized by WWF Austria and DCPO in Vienna in November 2015 and further consultations within the WWF network and with partners.

[1] **IUU:** Illegal, Unreported and Unregulated

[2] **Fish kill**, known also as **fish die-off**, refers to a localized die-off of fish populations which may also be associated with more generalized mortality of aquatic life. The most common cause is reduced oxygen in the water, which in turn may be due to factors such as drought, algae bloom, overpopulation, or a sustained increase in water temperature. Infectious diseases and parasites can also lead to fish kill. Toxicity is a real but far less common cause of fish kill.

Conservation Target/Scope:
Endangered sturgeon populations in priority rivers and seas in Europe, Asia and North America, where overexploitation is the biggest threat for sturgeons; major consumer countries for caviar and sturgeon meat.

STRATEGY 1: Combating overexploitation through market transformation, better law enforcement and conservation stewardship approaches

Objective 1.1: By 2025 and beyond, the level of exploitation of wild sturgeon is reduced to a point where it no longer poses a threat to the populations *through*:

1.1.1. Better understanding of the extent and circumstances of the sturgeon product **market**, consumer motivation, criminal structures and processes involved, in order to design and implement measures that lead to sustainable industry and consumption.

1.1.2. Advocating for a mandatory domestic **traceability system** for sturgeon products in Russia and other key market countries.

1.1.3. National **legislation and jurisdiction** enabling effective control, prosecution and prevention of illegal and unsustainable activities involving sturgeon.

1.1.4. Supporting effective implementation and **enforcement** of existing laws in key markets/key sites.

1.1.5. Developing incentives for **fishing communities** to reduce poaching/bycatch, developing sustainable livelihoods, and becoming sturgeon conservation stewards.

Conservation Target/Scope:
Habitats of endangered sturgeon species in the key rivers in Europe, Asia and North America.

STRATEGY 2: Protect and restore key habitats and ensure migration

Objective 2.1: By 2025, further deterioration of key priority habitats (for both current and future anthropogenic impacts) is stopped or mitigated through:

2.1.1. Securing funding for the **identification of key habitat locations**.

2.1.2. **Integrating conservation** of key habitat sites for sturgeons into sectoral **plans and strategies** for Priority Rivers and seas.

2.1.3. Initiating **restoration work** of key habitats where appropriate.

2.1.4. Applying appropriate **management** at selected habitats of top priority for sturgeons.

Objective 2.2: By 2025, supported by a coalition of key actors, the feasibility of making selected priority dams passable for fish is investigated, and technical solutions, including dam removal, are under preparation or implementation.

Objective 2.3: By 2025, key biodiversity safeguarding measures for sturgeon are integrated into financial schemes of key public banks, national funding programmes, and relevant sectoral national and international policies/strategies/plans for Priority Rivers and Seas, while implementation has been initiated through:

2.3.1. Advocating for **sturgeon safeguards** in investment policies of most relevant IFI and investment programs.

2.3.2. Initiating the implementation of integrated **biodiversity safeguarding measures for sturgeons** into financial schemes of key public bank /financing institutions and relevant sectorial policies/strategies/plans on an international level.

Conservation Target/Scope:
Sturgeon Populations on the brink of extinction in priority rivers and seas in Europe, Asia and North America.

STRATEGY 3: Save populations on the brink of extinction by establishment of living gene banks and conservation stocking – *has to be pursued in line with/as addition to objectives on Habitats/ Migration routes and Overexploitation and Life-Cycle and where reintroduction can take place.*

Objective 3.1: By 2025, State of the art ex-situ programs, coordinated and supervised by governments, are in place for sturgeon populations that are on the brink of extinction. This requires:

3.1.1. **Identification of populations** or sub-populations in need of ex-situ conservation by end of 2017.

3.1.2. **Understanding the in-situ life-cycle** (connected to key habitats) for key areas and populations by 2019.

3.1.3. **Ex-situ operations**, including rearing facilities and conservation stocking to support key areas and populations.

3.1.4. **Integrated transboundary monitoring** programmes are in place to measure effectiveness and impact of conservation stocking.

Scope:
Different communication actions and tools need to be implemented across the different strategies according to and depending on the respective conservation objectives.

INTEGRATED COMMUNICATION STRATEGY: Raise public awareness and political will to support implementation of the strategy – *supporting all other objectives in Overexploitation, Life-Cycle and Ex-situ conservation,*

This strategy needs to consist of tailored communication approaches[3] to the relevant target groups, including:

Objective 1: By 2020, **the general public** is aware of the value of sturgeon conservation for people and nature and is supporting it.

Objective 2: By 2020, **local stakeholders and business actors** are willing to act towards sturgeon conservation. The long-term economic value of sturgeon is understood.

Objective 3: By 2020, **key decision makers** support conservation programmes and transnational cooperation for their implementation.

Objective 4: By 2020, **legislative and enforcement authorities** are aware of the social, environmental and economic impacts, the links with organized crime, and are willing to apply the full range of laws available to prosecute cases concerning sturgeon fisheries crime along the value chain, and are willing to act for sturgeon conservation and cooperate transnationally.

A series of next steps including coordinative resources, cooperative studies and monitoring are needed to kick-off and guide the implementation of this WWF Network Sturgeon Strategy, outlined in an **Action Plan** to be appended to this Strategy.

[3] Tailored communication approaches will be developed in more detail once we have more inf ormation such as the results of the planned Sturgeon Market Study. By inserting a placeholder here, we are reminded that an integrated communication approaches should be attempted across strategies and possibly across countr ies/region.

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1. BACKGROUND INFORMATION

1.1. THE STURGEONS

Sturgeons and paddlefishes (the order of Acipenseriformes and the families of *Acipenseridae* and *Polyodontidae* in scientific terms), represent a small group of ancient fish with currently 27 species confined to the Northern hemisphere, which reveal common characteristics[4] (modified from WSCS 2005):

Sturgeons and paddlefish:

- Are recognized as a unique phylogenetic entity.
- Are evolutionary, ecologically, commercially, and recreationally important fish species.
- Have to migrate between different habitats like e.g. spawning, feeding and wintering sites to complete their life-cycle.
- Often cross borders in international watersheds.
- Have long life-cycles and late maturity with an average lifespan of 50 – 60 years (individuals of larger species may even live up to a hundred years and more) and most species do not spawn before they are 15 – 20 years old.
- Can serve as reliable long-term indicators for biodiversity in the aquatic communities.
- Their products (mainly caviar) are traded globally with CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) providing means of trade control.
- Are all listed in the IUCN Red List of Threatened Species™ and are more critically endangered, than any other group of fish species there. 85% of Acipenseriformes species are now on the brink of extinction. 63% (17 species) are listed as "Critically Endangered" (the Red List's highest category of threat) and four species within this category are even "Possibly Extinct".

17 SPECIES ARE LISTED AS CRITICALLY ENDANGERED

Sturgeons and paddlefish will thus need stringent, long-term and complex protection and rehabilitation measures to recover.

The main threats and actions to counteract them are outlined in the next chapters.

[4] For basic aspects of sturgeon biology and conservation see: "Biology and conservation of sturgeon and paddlefish" by **Roland Billard** and **Guillaume Lecointre** from **2001** in Reviews in Fish Biology and Fisheries 10: 355–392, 2001.

1.2. STURGEON THREATS

When it comes to **threats and causes for the decline of sturgeon populations**, it is often difficult to relate the threatened status of a given sturgeon species to a single cause or change in the environment. However, all sturgeons exhibit and share specific traits that make them extremely susceptible to anthropogenic impacts. Thus, one often encounters combinations of threats that may differ regionally, change with time and population status and are therefore not easy to prioritize in general for all species, populations and regions.

OVERFISHING FOR MEAT & CAVIAR IS A MAJOR THREAT FOR STURGEONS

As a source of sturgeon meat and caviar, sturgeons are very valuable and thus have been subject to high legal (yet often unsustainable) and (now mainly) illegal fishing pressure, commonly referred to as **overfishing**. Particular spawning and wintering sites are frequented each year and migrations are predictable for local fishermen, facilitating the catch of animals.

Annual spawning success and recruitment on the other hand are highly unpredictable and depend on the availability of suitable spawning habitat, suitable flow and temperature regimes during the reproductive period, as well as on the high fecundity of individual females, which do not spawn annually. **Habitat loss** through river infrastructure for e.g. navigation, dams, flood protection and the change of former wetlands into agricultural or habitable land put further pressure on the sturgeon life-cycle. Together with the overexploitation of adult spawners, changes in hydrological regime, destruction of key habitats or the **fragmentation of life-cycle habitat by dams**, dykes[5] and other **migration barriers** may result in the loss of reproduction and recruitment. **Navigation** itself becomes a considerable threat due to associated interventions (like dredging and straightening the course of the river) causing the loss of gravel beds for spawning and metamorphosis. Operations in rivers with high traffic can also impact sturgeons directly as propellers can cause disturbance especially of juveniles and adult fish can suffer from ship strikes. For some rivers **water pollution** and sediments extraction are posing extra stress, interacting with other threats.

The life-cycle of *Acipenseriformes* is generally quite long, with sexual maturity occurring late in life. Therefore, populations need a long time to recover from negative impacts such as overexploitation, calling also for long-term recovery programmes (several decades, in contrast to other fish populations) and a population management, which is well adapted to the respective species biology and ecology.

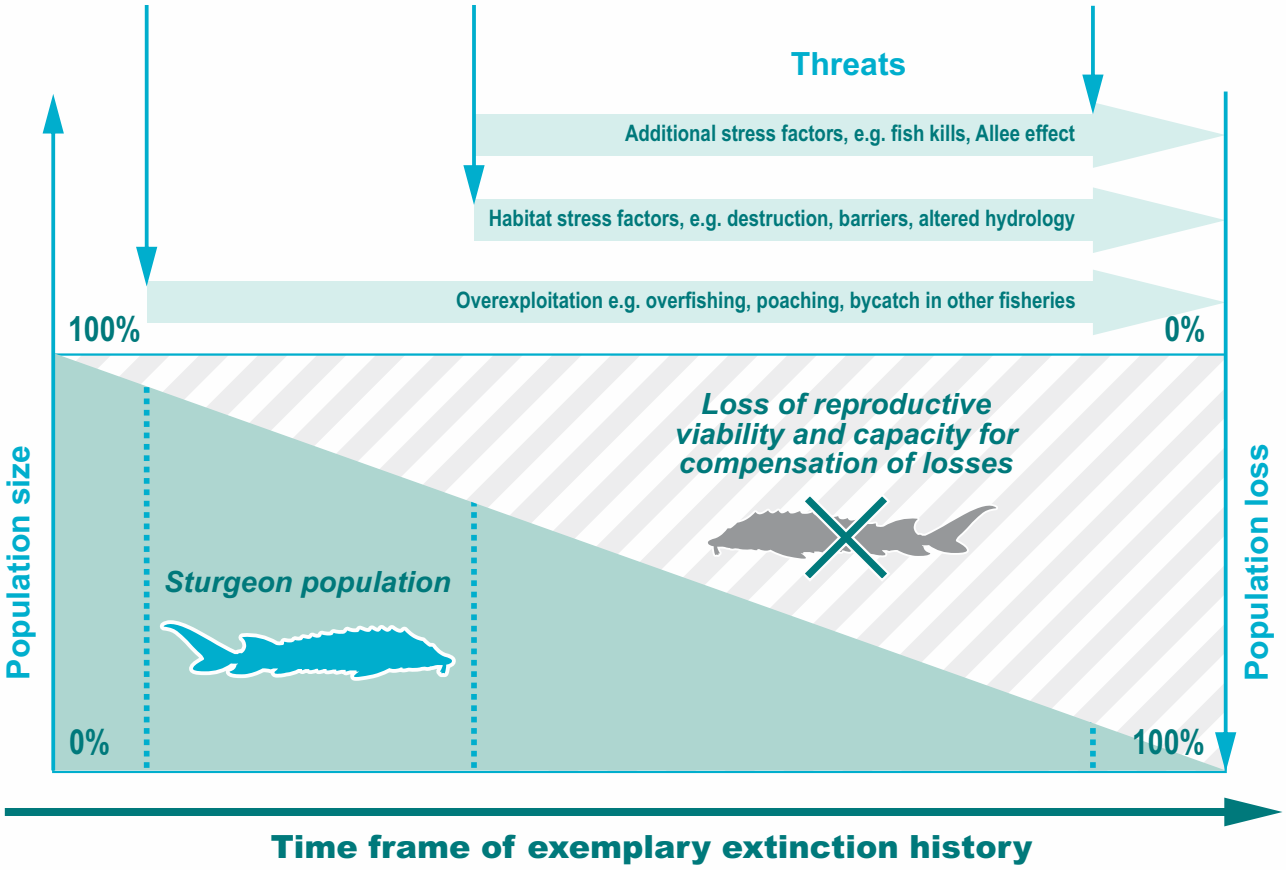
Natural hybridization may be ecologically disastrous under conditions of impacted habitats and reduced population sizes if exotic sturgeon species, genotypes or hybrids are introduced deliberately or unintentionally, causing the **loss of genetic integrity** of native species and thus may affect population fitness negatively by outbreeding depression.

Although it is difficult to generally prioritize threats for all sturgeon populations, it is safe to state, that most populations have already suffered from overexploitation in the past and still carry this historical burden until today, not having recovered and reached their original population sizes.

[5] Dykes may be barriers with respect to lateral connectivity. Some species may feed in the floodplain during high water events as described for the sterlet in the Danube River. Thus it might not be a barrier for the spawning migration but it leads to a fragmentation of habitat nevertheless.

This, in combination with additional negative impacts like e.g. impact of dams upon population structure and diversity (egg adaptability) of the populations, effect of mismanaged stocking programs, fish kills, the Allee effect[6] and an ongoing removal of individuals from the populations by intentional - e.g. for research or aquaculture purposes - or incidental catches, legal fishing or poaching and bycatches, for instance, leaves overexploitation as the biggest threat in most scenarios.

A common general threat scenario is presented in the exemplified and simplified image below. Note that impact of actual threats is not in scale here, as quantification in individual scenarios is difficult.



The international scientific community, together with national scientific institutions, conduct status assessments for sturgeon populations worldwide to update the IUCN Red list and national red lists. However there are still knowledge gaps about population information, actual trends, and mapping of key habitats for many populations and locations.

[6] "Allee effects are broadly defined as a decline in individual fitness at low population size or densit y, that can result in critical population thresholds below which populations crash to ex tinction." Allee Effects in Ecology and Conservation, Franck Courchamp, Ludek Berec and Joanna Gascoigne, 2008

1.3. PREVIOUS WWF INVOLVEMENT IN STURGEON RELATED WORK AND FUTURE PLANNED ACTIVITIES

The WWF network has already been involved in sturgeon related work and projects in the past on the following activities, targeting the different pressures on sturgeon[7].

ACTIVITIES RELATED DIRECTLY TO STURGEON POPULATIONS AND THEIR LIFE-CYCLE HABITAT

Activities **in-situ** (on site): improving conditions for wild populations in sturgeon rivers such as habitat research, behavioural research and tracking, monitoring and tagging, the prioritization of measures for maintaining or restoring migration corridors, more ecological operation of dams, mitigating or avoiding impacts of navigation projects potentially detrimental for sturgeon habitat and migration, or river/habitat restoration. **Ex-situ** (off site) measures such as conservation stocking, reintroductions and the planning of a breeding centre can complement in-situ work.

ACTIVITIES RELATED TO THE CHANGE OF HUMAN BEHAVIOUR

Activities under this topic deal with **influencing policy, legislation and planning** such as participating in the development of legal instruments and national action plans, the designation of Priority Rivers for migratory fishes and the active membership or observer status in international/global organizations such as e.g. the ICPDR.

Raising public **awareness**, including through education programmes for school children, can be important for gaining broad support for conservation measures and for creating public pressure on decision sturgeon to take action towards sturgeon conservation. **Stakeholder involvement and capacity building**, in particular working with fishing communities (e.g. on alternative income sources) and enforcement authorities (e.g. training courses) are important measures. Last but not least, the work on **trade and markets** such as market assessment studies, creation of a sustainable sturgeon markets, and a feasibility study on sustainable sturgeon farming are needed.

A COMMON FUTURE STRATEGY WOULD HELP STURGEON CONSERVATION

CURRENT PLANS FOR FUTURE ACTIVITIES

While quite some work had been done in the past by the WWF network, most current plans and activities for sturgeon conservation are rather small scale and suffer from a lack of funds and coordination. Possible impact on sturgeon conservation would be much stronger, if efforts around the world were aligned to the focus of a common strategy.

The outcomes proposed in this global sturgeon strategy 2.0 would help to bring resources together in a synergistic way and achieve critical contributions to planned global network outcomes 2025 of the WWF Freshwater and Wildlife Practices.

[7] Information is based on the results of a questionnaire sent out in preparation of the Sturgeon Strategy D evelopment Workshop (Nov 2015 organized by WWF Austria and DCPO) and returned by 18 different organizations (WWF offices: Austria, Bulgaria, Caucasus Programme, China, Germany, Hungary, Netherlands, Poland, Romania, Russia, Serbia, Switzerland, Ukraine, USA (former SERS Programme), USA (Northern Great Plains Programme), WWF-International and TRAFFIC).

1.4. FUTURE WWF INVOLVEMENT BY MEANS OF A GLOBAL STURGEON STRATEGY

The analysis of information (provided by the pre-workshop questionnaire) revealed the wish and the necessity of a joint WWF network approach on sturgeons in form of a **WWF Network Sturgeon Strategy**.

- A global sturgeon strategy will help focus and coordinate resources, where they are most needed.
- The cooperation between countries is crucial to better understand and tackle transboundary threats like longitudinal river connectivity pressures and cross border illegal trade activities.
- An aligned approach between range and consumer countries on this topic enables clear and effective work streams.
- It links to the WWF/ Traffic - Wildlife Crime Initiative
- A joint initiative attracts and enables cooperation with important strategic regional and international partners in sturgeon conservation.
- Sturgeons are charismatic umbrella species, which are suited to support global goals in river protection/restoration and connectivity issues.
- It fosters the sharing of experience, expertise and knowledge with each other.
- It raises the priority of sturgeon conservation within WWF and extends the flagship species range within the Northern Hemisphere.

The table below links main sturgeon traits to the WWF network, also showing an excellent match of strategic aspects. TRAFFIC is also considered here, as it is involved as a main partner for market research and other potential cooperation.

Sturgeons	WWF / TRAFFIC network
are charismatic flagship species	is a well reputed and species-oriented NGO
are threatened globally	works globally
species and populations face region-specific threats and combinations thereof	is organized in regional offices and programs
need an interdisciplinary approach for conservation and recovery	combines a variety of internal professional expertise and links to relevant external global, national and regional expertise and stakeholders
critical status calls for quick action	has worked with sturgeons already and is prepared and motivated
problems need long-term dedication	has a long-term perspective and exists since 1961
problems need political and public awareness	has a long-standing experience in working with political entities and raising public awareness
live on northern hemisphere, incl. Europe	WWF species conservation is very much focused on southern hemisphere and Africa and Asia

2. WWF GLOBAL STRATEGY

Drafting of this WWF Network Strategy Version was kick-started at a workshop in Vienna in November 2015 and then further developed through discussions of interested WWF offices/programmes and with external WWF partner organizations.

A “Priority rivers and seas” matrix became a basis for the priority lists.

All strategies are interconnected and overlap to a certain extent. Therefore, combined and well-coordinated approaches will be necessary for achieving objectives and goals:

1. Combatting Overexploitation

2. Restoring Life-Cycle Habitats

3. Conservation stocking

4. Communication (cross-cutting strategy of general importance)

In cases where overexploitation has been the major threat, it´s causes need to be tackled as first priority, as even the existence of excellent life-cycle-habitats, unblocked migration routes and other favourable environmental conditions cannot be effective, if populations are reduced to below viability levels. Even conservation stocking for supporting and restoring existing populations ultimately depends on the persisting existence of at least a relic population in the wild.

Knowledge of population status and life-cycle and sufficient availability of respective life-cycle habitats are the basic prerequisites for successful in-situ measures such as habitat protection and restoration, but also for ex-situ measures such as conservation stocking, as all relevant information has to be retrieved from the still existing wild populations and their habitat use.

However, in many cases, one might have to balance the chances and risks and use a well-coordinated simultaneous approach to quickly counteract the anticipated extinction of a certain species or population.

Subsequently, the single strategies and their key results are presented in detail.

Causes for **overexploitation** need to be tackled as first priority

Credit: Russian Caviar House

2.1. OVEREXPLOITATION: "COMBATTING OVEREXPLOITATION THROUGH MARKET TRANSFORMATION, BETTER LAW ENFORCEMENT AND WORK WITH FISHERIES"

Conservation Target/Scope:
Endangered sturgeon populations in priority rivers and seas in Europe, Asia and North America, where overexploitation is the biggest threat for sturgeons; major consumer countries for caviar and sturgeon meat.

STRATEGY 1: Combating overexploitation through market transformation, better law enforcement and conservation stewardship approaches

Objective 1.1: By 2025 and beyond, the level of exploitation of wild sturgeon is reduced to a point where it no longer poses a threat to the populations *through*:

1.1.1. Better understanding of the extent and circumstances of the sturgeon product **market**, consumer motivation, criminal structures and processes involved, in order to design and implement measures that lead to sustainable industry and consumption.

1.1.2. Advocating for a mandatory domestic **traceability system** for sturgeon products in Russia and other key market countries.

1.1.3. National **legislation and jurisdiction** enabling effective control, prosecution and prevention of illegal and unsustainable activities involving sturgeon.

1.1.4. Supporting effective implementation and **enforcement** of existing laws in key markets/key sites.

1.1.5. Developing incentives for **fishing communities** to reduce poaching/bycatch, developing sustainable livelihoods, and becoming sturgeon conservation stewards.

Overexploitation generally can be defined as harvesting a renewable resource to the point of diminishing returns. Continuing overexploitation leads to the destruction of the resource. This includes any kind of removal of individuals from a population, which the population cannot compensate for by reproduction, such as unsustainably managed legal fisheries, poaching, incidental bycatches in other fisheries, but potentially also badly planned and implemented scientific and conservation projects as well as increased mortalities through inefficient up and downstream migration assisting structures and protection devices for water intakes.

Local fishing communities must be involved in sturgeon conservation efforts to develop an understanding for the necessity for protection measures and accept them; fishermen should be supported in gaining their livelihood from other sources than sturgeon fishing until stocks have recovered (which might take as long as 100 years). This implies analyzing current livelihoods and developing possible solutions such as sustainable income generating activities together with fishing entrepreneurs and other stakeholders. Additionally, a change of daily business of fishing communities to generate income but also occupation and recognition is needed in order to move towards effective conservation stewardship for sturgeons.

Sturgeon aquaculture products, which potentially could replace wild sturgeon meat and caviar on the market, at the same time pose risks for wild populations. It could be a threat for wild population's genetic integrity in cases where stocking is carried out with fish not suited for release (this could include transfer of pathogens, intra and interspecific hybrids, exotic species, etc.). Aquaculture operators who extract adult spawners for reproduction can stress the populations even more, also, caviar from poached sturgeons can be "laundered" by falsely labelling it as originating from aquaculture.

Thus another key entry point to battle overexploitation is the transformation of markets. This includes the introduction of a mandatory traceability system for sturgeon products with measures for minimizing fraud and misuse - in particular on the largest domestic markets - and advocacy work for its enforcement to ensure that the source of the fish is legal and stringently documented. The Russian Federation continues to be a large domestic and export market for caviar and sturgeon products. The EU, the USA, Switzerland, and Japan were found to be the major caviar consumers in 1998-2006, according to a TRAFFIC report, indicating where measures should be focused.

The CITES caviar labelling system provides a minimum set of **traceability** requirements, while further improvements and other complementing traceability schemes should be encouraged nationally, especially if they are in line with related discussions under CITES. Wild sturgeon meat or caviar from poached sturgeons would consequently not so easily be labelled falsely as stemming from aquaculture. Introduction of relevant ISO standards and ASC (Aquaculture Stewardship Council) certification for sturgeon farms might also increase sustainability and traceability of caviar and sturgeon products.

CITES CAVIAR LABELLING SYSTEM

provides a minimum set of traceability requirements

© WWF

In order to ensure that national legislation **enables effective control and prevention of illegal and unsustainable activities** involving sturgeons, full and effective implementation of relevant international conventions[8], in particular UNTOC, UNCAC and CITES, is a strong starting point, including the application of relevant criminal laws (concerning fraud, money laundering and tax evasion, and environmental and trade laws for fisheries crimes[9] involving sturgeon).

The increase of political will, capacity building and increased cooperation of the respective authorities (both interagency and transborder) are preconditions for more effectively enforced legislation on sturgeon fishing and sturgeon products in key markets and key sites. This disrupts and decreases the business of illegal national and international wildlife trade and leads to reduced illegal fishing.

WWF and partners can contribute to the achievement of these objectives by e.g. initiating or organizing capacity building events, facilitating interagency/transborder cooperation platforms, or building up public pressure towards better law enforcement.

[8] Relevant international conventions include the UN Convention against Transnational Organized Crime (UNTOC), the UN Convention against Corruption (UNCAC), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

[9] See definition at glossary here

2.2. LIFE-CYCLE: "PROTECT AND RESTORE KEY HABITATS AND ENSURE MIGRATION"

Conservation Target/Scope:
Habitats of endangered sturgeon species in the key rivers in Europe, Asia and North America.

STRATEGY 2: Protect and restore key habitats and ensure migration

Objective 2.1: By 2025, further deterioration of key priority habitats (for both current and future anthropogenic impacts) is stopped or mitigated through:

2.1.1. Securing funding for the **identification of key habitat locations**.

2.1.2. **Integrating conservation** of key habitat sites for sturgeons into sectoral **plans and strategies** for Priority Rivers and seas.

2.1.3. Initiating **restoration work** of key habitats where appropriate.

2.1.4. Applying appropriate **management** at selected habitats of top priority for sturgeons.

Objective 2.2: By 2025, supported by a coalition of key actors, the feasibility of making selected priority dams passable for fish is investigated, and technical solutions, including dam removal, are under preparation or implementation.

Objective 2.3: By 2025, key biodiversity safeguarding measures for sturgeon are integrated into financial schemes of key public banks, national funding programmes, and relevant sectoral national and international policies/strategies/plans for Priority Rivers and Seas, while implementation has been initiated through:

2.3.1. Advocating for **sturgeon safeguards** in investment policies of most relevant IFI and investment programs.

2.3.2. Initiating the implementation of integrated **biodiversity safeguarding measures for sturgeons** into financial schemes of key public bank /financing institutions and relevant sectorial policies/strategies/plans on an international level.

The protection and restoration of key habitats and their ecological connectivity are often referred to as "in-situ" or "on site" measures, as they take place in the natural environment. The life-cycle is a recurring series of changes that an organism undergoes (developmental stages), returning to the starting state and including its renewal. It is necessary for the survival and renewal of the population. Existence and accessibility of distinctive habitat for spawning, feeding, and wintering as well as nursery sites for different stages of the sturgeon life-cycle need to be protected or restored.

In the case of the sturgeons this life-cycle can be spread out over a significant part of the length of a river system, including adjacent marine areas, as well as over decades of individual sturgeon lifetime. This is particularly challenging as many sturgeon species for different developmental stages over the decades of their lifetime use almost the whole length of the river and even marine areas. Sturgeon conservation therefore implies long-term and geographically wide-spread responses.

This strategy consists of a three-pronged approach of strategic actions:

1. **Identification, protection and restoration of key habitats** is an obligatory step in successful sturgeon conservation with the following rationale:
   - Special protection measures of habitats can only be included into sectorial plans and strategies in relevant rivers and seas when their location is known. Ensuring proper management at these locations (within or outside of protected areas) is essential.
   - Poaching and accidental bycatch can be tackled in a more focused way if spawning, feeding, nursing and wintering habitats of sturgeons are known.
   - The planning and implementation of solutions for enabling the passage of sturgeon and other fish across migration barriers such as dams need to be coordinated with habitat protection and restoration up- and downstream of the respective barrier.
   - Conservation stocking and re-introduction activities need detailed knowledge on available habitats, since synchronization with the in-situ lifecycle is mandatory.
2. **Ensuring sturgeon migration** calls for the identification of key blockages and feasibility assessments for sturgeon fish passes and/or dam removal.
3. **Preventing development of new unsustainable river infrastructure** by lobbying for the incorporation of sturgeon safeguarding measures into investment policies of international finance institutions and public infrastructure financial programmes. In the future, no river infrastructure in relevant rivers should be built without sturgeon needs adequately being considered in environmental impact procedures and consequent plans.

2.3. EX-SITU CONSERVATION: "SAVE POPULATIONS ON THE BRINK OF EXTINCTION WITH CONSERVATION STOCKING"

Conservation Target/Scope:
Sturgeon Populations on the brink of extinction in priority rivers and seas in Europe, Asia and North America.

STRATEGY 3: Save populations on the brink of extinction by establishment of living gene banks and conservation stocking – *has to be pursued in line with/as addition to objectives on Habitats/ Migration routes and Overexploitation and Life-Cycle and where reintroduction can take place.*

Objective 3.1: By 2025, State of the art ex-situ programs, coordinated and supervised by governments, are in place for sturgeon populations that are on the brink of extinction. This requires:

3.1.1. **Identification of populations** or sub-populations in need of ex-situ conservation by end of 2017.

3.1.2. **Understanding the in-situ life-cycle** (connected to key habitats) for key areas and populations by 2019.

3.1.3. **Ex-situ operations**, including rearing facilities and conservation stocking to support key areas and populations.

3.1.4. **Integrated transboundary monitoring** programmes are in place to measure effectiveness and impact of conservation stocking.

As this topic is quite complex and the term “stocking” with regard to sturgeon conservation is often used in a misleading or even false context, a description of the subject is necessary.

Different terms have been used for this kind of activity including “ex-situ operations”, “conservation breeding”, “conservation hatchery”, “conservation aquaculture”, “captive breeding” or just simply “hatchery”. The latter is often misleading, as ex-situ measures do partially take place in a controlled or captive environment, yet go beyond the concept of merely producing large quantities of fertilized sturgeon eggs, letting them hatch and release the resulting offspring into a water body.

The successful use of controlled propagation for sturgeon conservation in hatcheries or live gene banks strongly depends on 1) availability of sufficient broodstock of all species and genotypes, 2) how well hatchery operations can preserve the genetic identity and diversity, and 3) how well hatchery-reared animals can adapt to natural habitat conditions and, as well as all other key attributes of the natural populations.

Ex-situ measures consist of the establishment of broodstock representing the heterogeneity and integrity of the wild population or population fragments from endangered populations in captivity, acting as a “living gene banks”, and their reproduction under nature-like environmental conditions in order to release juveniles, which are fit for survival in the wild. Thus, they work in accordance with the existing life-cycle of populations, ensuring the feasibility of measures with regard to a functioning river ecology and ecosystem health.

These measures serve three main purposes:

- The conservation of endangered sturgeon populations or populations on the brink of extinction by establishing captive life-cycle units.
- The stabilization of populations by providing juveniles for release fit for survival in the wild, to compensate for deficits in natural reproduction and to ensure viable year-classes of future wild spawners.
- The reintroduction into formerly inhabited water bodies, where the risk factors leading to extinction are eliminated, and where genetic purity and diversity of historical stock are ensured.

ONE OF THE MOST IMPORTANT AIMS OF CONSERVATION STOCKING IS TO MAINTAIN AND PROTECT THE GENETIC IDENTITY AND DIVERSITY

The in-situ life-cycle of the respective populations in the wild defines the conditions of ex-situ operations. This means also, that ex- and in-situ measures are closely linked and have to be well coordinated and synchronized. These measures are intended to “buy time“ to ensure successful implementation of in-situ improvements. However, such recurrent introduction of individuals from a captive environment into natural populations includes the threat of altering the gene pool and having detrimental effects on a population. Thus, one of the most important aims of conservation stocking is to maintain and protect the genetic identity and diversity, as well as the morphological and behavioural characteristics of the respective populations in both captivity and the wild.

This clearly distinguishes these operations from introductions in areas without natural sturgeon populations, the economic boosting of a sturgeon fishery by the release of juveniles, as well as from hatchery operations for the production of sturgeon products for human consumption.

Conservation stocking can only be effective, if broodstock of a certain population still exists (see also “Overexploitation” above) and if there still is the life-cycle-habitat and the respective knowledge to work with (see also “Life-Cycle” above).

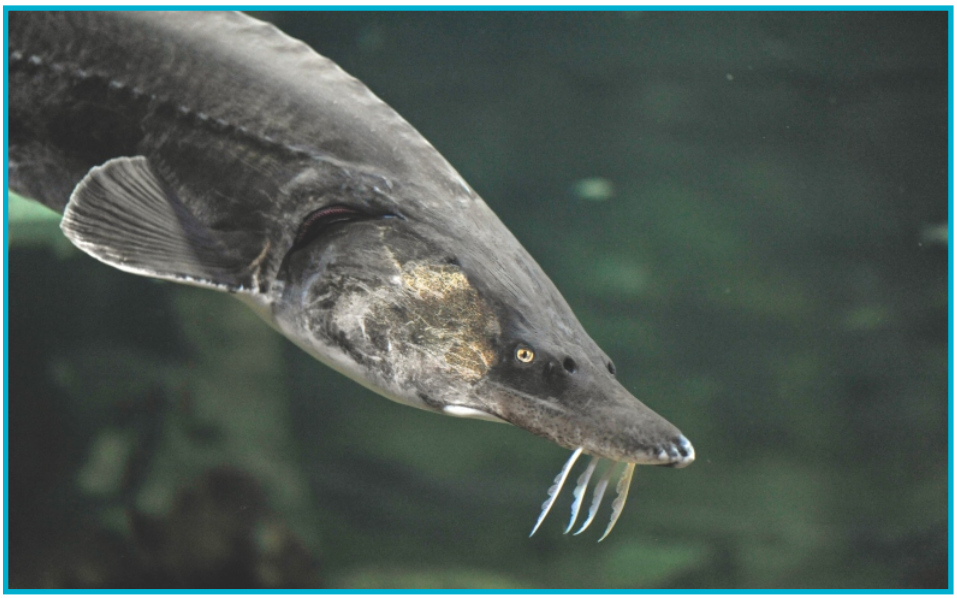
To save populations on the brink of extinction with conservation stocking programmes, raising political will to not "just" finance such programmes - incl. monitoring of impact - for the long-term but also for transboundary cooperation on the topic will be key. International collaboration will also need to be a priority for facility management in order to ensure the sharing of best practice methodology.

Good practice examples for the use of ex-situ methodology in sturgeon conservation include measures for the European Sturgeon (*Acipenser sturio*), for instance. This species, which is currently confined to the Gironde system in France, would have been lost if such measures would not have been taken (WILLIOT et al. 2009). Nowadays, the establishment of broodstock in captivity is the basis for species recovery for reintroduction activities in Germany and the Netherlands.

Another example for successful implementation of ex-situ-measures for the conservation and stabilization of a sturgeon population is that of the White Sturgeon (*Acipenser transmontanus*) in the Kootenai River (AFS MONTANA).

The Kootenai Tribe of Idaho Conservation Aquaculture Program began operation in 1990 to evaluate the feasibility of using aquaculture as a component of recovery for sturgeon in the Kootenai River. Sturgeon hatchery methods were largely experimental when the Kootenai program was first initiated, as conservation was generally a new purpose for fish hatcheries at that time. The Kootenai River White Sturgeon Study and Conservation Aquaculture Project was later expanded to help preserve the genetic variability of the population, begin rebuilding natural age class structure, and prevent extinction while measures were implemented to restore natural recruitment (IRELAND et al. 2002, KTOI 2004, 2005). This program is currently meeting its objectives of reducing the threat of extinction by annually providing year classes from native broodstock, representing inherent within-population genetic diversity in its broodstock and progeny groups, and minimizing the introduction of disease into the recipient wild population (IRELAND et al. 2002, KTOI 2004, 2005). However, these activities have not been backed up by habitat restoration, thus not meeting all standards defined in this strategy.

Technical information on state-of-the-art controlled propagation of sturgeons, especially with regard to conservation breeding, ecologically sound supportive stocking for wild populations and the production of juveniles, which are fit for survival in natural water bodies, can be found in two technical papers by the FAO. These can also be downloaded from the internet: see [4], [5].



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2.4. COMMUNICATION: "AN INTEGRATED STRATEGY TO RAISE AWARENESS OF PUBLIC AND POLITICAL WILL TO ACT"

Scope:
Different communication actions and tools need to be implemented across the different strategies according to and depending on the respective conservation objectives.

INTEGRATED COMMUNICATION STRATEGY: Raise public awareness and political will to support implementation of the strategy – *supporting all other objectives in Overexploitation, Life-Cycle and Ex-situ conservation.*

This strategy needs to consist of tailored communication approaches[10] to the relevant target groups, including:

Objective 1: By 2020, **the general public** is aware of the value of sturgeon conservation for people and nature and is supporting it.

Objective 2: By 2020, **local stakeholders and business actors** are willing to act towards sturgeon conservation. The long-term economic value of sturgeon is understood.

Objective 3: By 2020, **key decision makers** support conservation programmes and transnational cooperation for their implementation.

Objective 4: By 2020, **legislative and enforcement authorities** are aware of the social, environmental and economic impacts, the links with organized crime, and are willing to apply the full range of laws available to prosecute cases concerning sturgeon fisheries crime along the value chain, and are willing to act for sturgeon conservation and cooperate transnationally.

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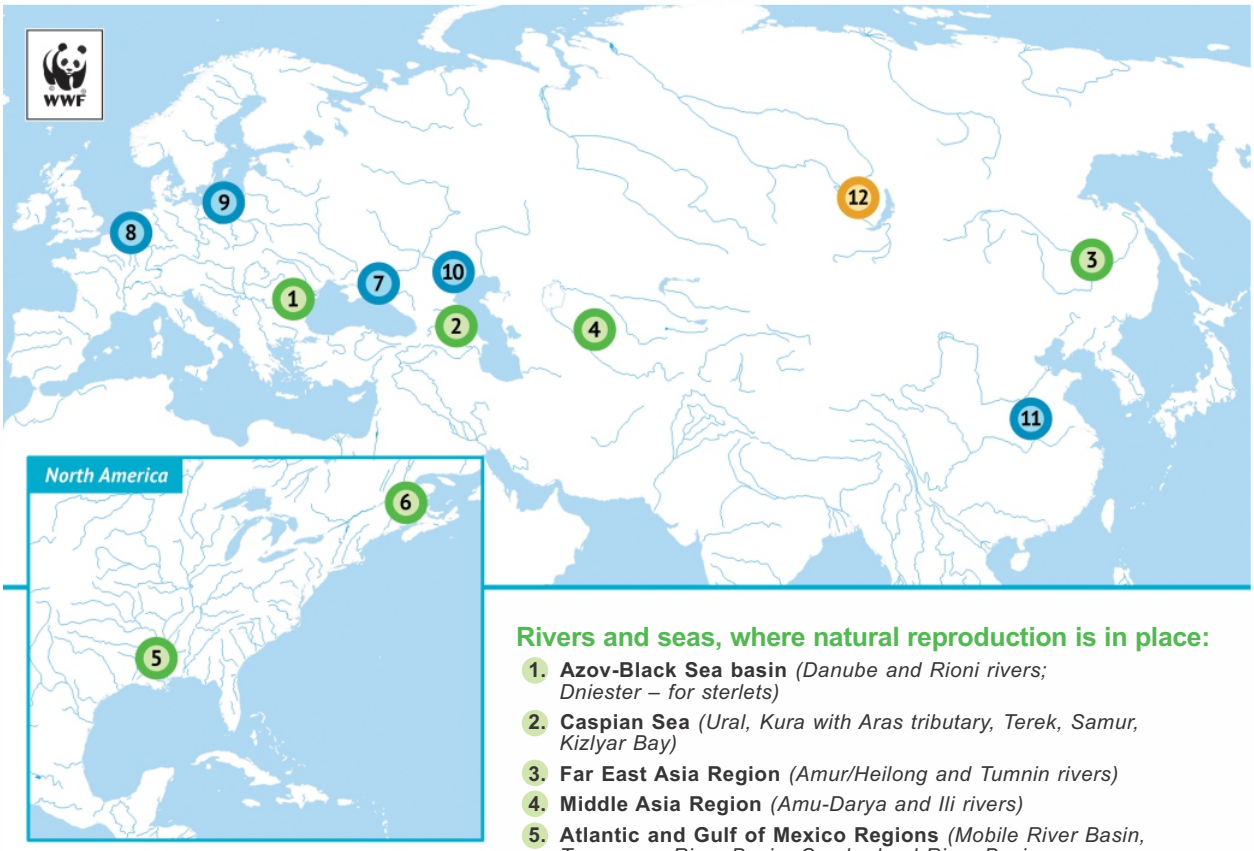
Accurate selection of target groups and preferred approaches per strategy and target audience are needed for tailored communication concepts and high effectiveness. Professional communication is a strength of the WWF network, but only careful consideration of how communication and conservation activities complement each other will lead to the desired impact.

Targeting the **general public** has the objective of not only changing behaviour of consumers, but also aims at creating public pressure and support for ambitious measures by decision-makers towards sturgeon conservation. Raising the awareness of key **stakeholders** of the economic value of healthy sturgeon populations is expected to lead to support for sustainable fishing and trade practices. Addressing **decision-makers** would be prerequisite for adequate funding and sustainable sectorial policies.

[10] Tailored communication approaches will be developed in more detail once we have more inf ormation such as the results of the planned Sturgeon Market Study. This is just to remind us that integrated communication approaches should be attempted across strategies and possibly across countr ies/region.

3. FOCUS RIVERS AND SEAS

For the purposes of defining focus of work under this WWF Network Sturgeon Strategy, rivers have been mapped where WWF wants to remain or become active and where natural reproduction is still maintaining sturgeon populations. This is where global action of the WWF network and partners is expected to have highest impact. In addition, rivers and marine areas have been compiled where WWF is active but sturgeon reproduction is mainly supported by restocking. Consequently, **the list below does not include all rivers were sturgeon conservation is being undertaken or is needed**. We hope other organizations will join forces to fill those gaps the WWF network cannot cover.



Rivers and seas, where natural reproduction is in place:

1. **Azov-Black Sea basin** *(Danube and Rioni rivers; Dniester – for sterlets)*
2. **Caspian Sea** *(Ural, Kura with Aras tributary, Terek, Samur, Kizlyar Bay)*
3. **Far East Asia Region** *(Amur/Heilong and Tumnin rivers)*
4. **Middle Asia Region** *(Amu-Darya and Ili rivers)*
5. **Atlantic and Gulf of Mexico Regions** *(Mobile River Basin, Tennessee River Basin, Cumberland River Basin, Rio Grande/Bravo Basin)*
6. **St. John river** *(Canada)*

Rivers and seas where reproduction is supported mainly through restocking:

7. **Azov-Black Sea basin** *(Dniester, Don, Kuban with coastal areas)*
8. **Rhine river**
9. **Baltic sea basin** *(Odra and Vistula river)*
10. **Caspian Sea** *(Volga)*
11. **Far East Asia Region** *(Yangtze river)*

Rivers where WWF intents to work, but currently has no capacity

12. **Siberian rivers** *(Ob, Yenisey, Lena rivers, Baikal lake)*

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6. GLOSSARY

GLOSSARY OF STURGEON RELATED TERMS IN THE TEXT

Aquaculture: The farming of aquatic organisms in inland and coastal areas, involving intervention in the rearing process to enhance production and the individual or corporate ownership of the stock being cultivated.

Allee effect: The generally accepted definition of Allee effect is positive density dependence, or the positive correlation between population density and individual fitness. It can sometimes be referred to as "undercrowding" and it is analogous (or considered synonymous by some) to "depensation" in the field of fishery sciences.

Broodstock: Specimen or species, either as eggs, juveniles, or adults, from which a first or subsequent generation may be produced in captivity, whether for growing as aquaculture or for release to the wild for stock enhancement.

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora - an international agreement between governments, aiming to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Conservation: In the document at hand it is the act of preserving, guarding, or protecting biodiversity, environment, and natural resources, including protection and management.

Controlled propagation: The reproduction of fishes under human control, often in captivity.

Depensation: In population dynamics, depensation is the effect on a population (such as a fish stock) whereby, due to certain causes, a decrease in the breeding population (mature individuals) leads to reduced production and survival of eggs or offspring. The causes may include: predation levels rising per offspring (given the same level of overall predator pressure), or the allee effect, particularly the reduced likelihood of finding a mate.

DSTF: Danube Sturgeon Task Force – an interdisciplinary network dedicated to the conservation and revival of Danube River sturgeons.

EIA: Environmental Impact Assessment

Ex-situ: Referring to conservation activities outside of the natural environment of an organism, often in captivity.

FAO: Food and Agriculture Organization of the United Nations.

Fishery crimes: Crimes connected to fishing activities, which includes planning of fishing activities (financial, insurance, ownership and registration of vessels etc) and a wide variety of related criminal offences including corruptly obtained permits and licences, document fraud, tax evasion, money laundering, kidnapping, human trafficking, and drug trafficking. Fisheries crime is widespread, usually transnational, largely organized , and can have severe adverse social, economic and environmental impacts both domestically and internationally. [8]

Hatchery: Place for artificial breeding, hatching and rearing through the early life stages of animals, finfish and shellfish in particular. Generally, in pisciculture, hatchery and nursery are closely associated.

ICPDR: International Commission for the Protection of the Danube River.

In-situ: Referring to conservation activities in the natural environment of an organism, in the case of this document the Sturgeon Rivers and adjacent marine areas.

IUCN: International Union for Conservation of Nature

IUU fishing: Illegal, unreported and unregulated fishing, often having detrimental effects on stocks (e.g. overexploitation). See more at FAO.

Life-cycle: The sequence of life stages that an organism undergoes from birth to reproduction ending with the generation of the offspring.

Live gene bank: Facility for the preservation of genes as living organisms.

Population: All the organisms of the same group or species, which live in a particular geographical area, and have the capability of interbreeding. In the document at hand this term is often used for subunits within a sturgeon species, which are significantly different from others in important traits (e.g. location of spawning sites, timing and distance of spawning migration), leading to a significantly reduced reproduction with other subunits and that should therefore be conserved separately.

Spawning: Refers to the process of releasing the eggs and sperm for the reproduction of aquatic species and also sturgeons.

Spawning site: Spawning sites or grounds are the areas of waterbodies, where aquatic animals spawn.

Stocking: Process of moving live organisms to a rearing unit or a natural water body so that ongrowing (e.g. in nursery ponds, fattening ponds) or reproduction (e.g. in spawning ponds) may take place

Universal labelling system for the identification of caviar: a uniform labelling system applying to all caviar, from wild and aquaculture origin, produced for commercial and non-commercial purposes, for either domestic or international trade, and based on the application of a non-reusable label on each primary container.

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