

## **MAN-MADE HABITAT ALTERATIONS AND THEIR IMPACTS ON STURGEON POPULATIONS**

**Workshop held in Beijing, China, August 24 – 26, 2004  
In conjunction with the 19<sup>th</sup> International Congress of Zoology**

### **Workshop on Conclusions and recommendations**

The workshop on „Man-made Habitat Alterations and Their Impacts on Sturgeon Populations“ was held from August 24 to 26 in conjunction of the 19th International Zoology Congress (ICZ). The two sessions were well attended and served as a discussion forum on critical issues related to the subject. Besides several overview contributions from European and Asian scientists, there were about 14 contributions from Chinese researchers, addressing specific topics as listed in the amended programme (see attachment). There was also an active participation from sturgeon farmers of central China who showed their operations and concepts through CD-Video presentations. The workshop was attended by about 55 participants.

The presentations covered a number of critical aspects, including issues on river damming, environmental and habitat degradation and changes in recruitment of sturgeon stocks around the world. Major emphasis was placed on the pros and cons of past and present concepts and programmes to safe the Chinese sturgeon stocks, mainly in the Yangtze River system. Also, the need for conservation of sturgeons species across watersheds and national boundaries was considered as an important issue that should not be neglected.

### **Recommendations:**

#### ***Reasons for stock decline and potential mitigation measures***

It was generally agreed that sturgeon stocks continue to decline in most parts of the world at an alarming rate. Despite ongoing efforts the present situation in the Caspian and Black Seas as well as in other Asian areas, in particular China, the risk for loosing most of the stocks and bringing several species close to extinction is still very high.

It was recognized that

- a) habitat destruction and river damming (with subsequent impacts on the hydrodynamic regimes) are among the major obstacles threatening the stocks. Concern was expressed to the threat of further sturgeon species, particularly *Psephurus gladius* and *Acipenser dabryanus* for which attempts on ex-situ conservation are also urgently needed.
- b) damming will continue to expand on most of the rivers used by sturgeons as migratory path to spawning grounds
- c) planning of hydro-power dams and other structures that obstruct river flow should - from the start - include extensive plans on mitigation strategies that either would allow fish to overcome these obstacles to reach the historic spawning grounds or compensate adequately for their loss.
- d) constructing artificial spawning sites in rivers or adjacent to old river beds should be strongly encouraged in order to replace lost habitat thereby assisting the conservation of the dwindling sturgeon resources.

### ***Conserving genetic diversity***

Any technical mitigation strategy should take the guidelines on conservation genetics fully into account in managing sturgeon populations adequately. In particular it is recommended that:

- a) Perform an initial analyses on the natural populations of native Chinese species in order to identify the conservation units to be separately managed.
- b) Establish a broodstock as founder population in a properly planned manner in order to minimize the loss of genetic diversity and to avoid inbreeding and outbreeding depression.
- c) Initiate due sampling practices (e.g. tissue preservation) from all animals used as breeders and for the production of stocks that are to be released to allow for future genetic tagging. All the reproductions should be completely recorded for this purpose.

A representative collection of reference samples should be planned trying to represent as many populations as possible. These samples should be available for the scientific community upon motivated request.

### ***Brood stock development /establishment***

It is recommended that for the remaining sturgeon species for which rehabilitation programmes are intended or underway,

- a brood stock should be established as soon as possible without any delay and further consideration of its future use.
- Brood stock establishment should follow clear guidelines as to the system layout and safe operation, including aspects of behavioural needs of the species as the culture period will be longer than normally known for teleost species
- Studies on basic physiology (e.g. metabolism, nutrition, reproductive physiology and environmental quality requirements, osmoregulation) should be strongly encouraged to gain insight in species needs for proper life cycle completion to meet also long-term ecophysiological objectives for re-naturation of stocks
- The protocol for building brood stocks should include guidelines that ensure best coverage of the genetic diversity (see also recommendation on conservation genetics)
- There is an urgent need for appropriate training at all levels (management, biologists, technical personnel) for handling endangered species and in particular sturgeons in order to ensure professional handling of brood stock specimens, appropriate technical management of culture systems, adequate care of behavioural needs of the species concerned and care of nutritional requirements as well as best handling practices during the entire maturation and spawning phase.
- The development of codes on best environmental practice (BEP) and best Available Technology (BAT) for sturgeon species is strongly encouraged while the necessary scientific work needed to develop these codes should be undertaken as soon as possible.

### ***Restocking programmes***

The recommendations derived at the meeting with regard to restocking focus mainly on Chinese sturgeon problems in the Yangtze River. Since 1983 stocking programmes are under way with varying intensity and changing strategy.

It is strongly recommended that the restocking efforts are not only continued but accompanied by research and management projects that focus on

- habitat improvement for young fish and evaluation of release sites as well as the best time-size-release window of juveniles.
- Continuing and intensifying the monitoring of survival and growth of released fish, using most advanced technologies available (including marking and tagging; tracking over longer periods and distances)
- studying the genetic interactions of wild and cultured sturgeons with subsequent strategies for stock enhancement methodologies aiming at preventing loss of genetic population diversity
- increasing public awareness on sturgeon issues, particularly with fisher folks, and stimulate active and responsible participation of the fishery community in protecting the resource while also reliably reporting on recaptures
- initiating releasing programmes with different fish sizes at various release times. Such projects should be undertaken over a number of years with consistent criteria to derive at sound data on best stocking practices leading to good survival and demonstrable contribution to stock enhancement. Complementary release of eggs and larvae should be undertaken to avoid relaxing genetic selection
- Studying the factors that trigger habitat choice of adult fish in relation to (e.g.) eco-hydraulics and bottom topography of the river bed in order to understand what attracts fish to (a) spawning sites and (b) fish path structures.
- Continue monitoring egg drift, deposition and predation in order to gain insight in recruitment capacity and in survival potential thereby assisting to develop better strategies for effective culture-release projects.

### *General considerations*

These measures should help to ensure the development of best stocking practices to assist in sustaining this valuable resource.

Cross watershed issues should be duly addressed at national, regional and international level to support sturgeon conservation

Develop a strategy and action plan for each of the Chinese sturgeon species.

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