



Global Re-introduction Perspectives: 2010

Additional case-studies from around the globe
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IUCN/SSC Re-introduction Specialist Group (RSG)





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Published by: IUCN/SSC Re-introduction Specialist Group & Environment Agency-ABU DHABI

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Citation: Soorae, P. S. (ed.) (2010) GLOBAL RE-INTRODUCTION PERSPECTIVES: Additional case-studies from around the globe. IUCN/SSC Re-introduction Specialist Group, Abu Dhabi, UAE, xii + 352 pp.

ISBN: 978-2-8317-1320-5

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Re-inforcement of Adriatic sturgeon in the Ticino River, Lombardy, Italy

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Introduction

The Adriatic sturgeon (*Acipenser naccarii*) is a threatened fish considered endemic to the Adriatic region (Albania, Croatia, Italy, Serbia & Montenegro and Slovenia). In Italy its historical range covers the northern part of the Adriatic Sea from which, in the first months of the year, fishes migrate upstream in the main rivers and tributaries - Po, Adige, Brenta, Piave and Tagliamento - remaining for the breeding season in freshwater until October (Bernini & Nardi, 1990). Regarding the Po river basin, in the 19th century this species migrated upstream until Turin. Since 1961 the dam of Isola Serafini at the Po confluence with Adda River prevented *Acipenser naccarii* from reaching its main spawning areas (middle-lower reach of Ticino, Agogna and Sesia rivers) from the sea. In these areas upstream the dam a small population of Adriatic sturgeon performing its entire life cycle in freshwater (Nardi, 1982; Gandolfi *et al.*, 1991). This fully protected species is classified as vulnerable (VU A1ac) in the ver 2.3 IUCN Red Data Book. It is included in Annex B of CITES, Annex II of the Bern Convention and Annex II and IV of Habitat Directive of European Union.

Goals

- Goal 1: Support the land locked population of Adriatic sturgeon present in the Ticino river in long-term.
- Goal 2: Improve the interest of this species at local level and in the Po basin area.
- Goal 3: Realize a captive breeding program for the species to support the release program.
- Goal 4: Realize two fish stairs on two dams in upper part of Ticino Rivers as stepping stone to reconstitute the ecological freshwater corridor with the Adriatic Sea.

Success Indicators

- Indicator 1: Reproduction over a medium-term period.
- Indicator 2: Occupancy of the most part of suitable area for the Adriatic sturgeon in the Ticino river.

Project Summary

The capture of some young and adult individuals of about 20 kg in the Ticino river (Bruno, 1987) confirmed the presence of a small population of Adriatic sturgeon

performing its entire life cycle in freshwater. This population is protected since 1974 by the establishment of the Ticino Regional Park. A preliminary step in the conservation of this land-locked population was performed by the environmental agency of the regional government of Lombardy. Since 1988 about 250,000 young individuals of Adriatic sturgeon, originating from a stock of 70 wild specimens reared in a fish farm (Azienda Agricola VIP, Brescia, Italy), have been released. No reproductive success was recorded.

Feasibility: A monitoring survey on fish fauna of the Ticino river carried out by GRAIA in 1999, confirmed the decline of this small population and underlined the presence of limiting factors affecting its long-term survival. The aim of the Ticino project, started in 2003 within a three years Life project supported by the European Union and the environmental agency of the regional government of Lombardy was to support this population through the contrast of the main impact derived from human activities. These activities are illegal fisheries, habitat fragmentation, release of exotic species, river damming and intrinsic factors such as low density with consequent potential increase of genetic drift, slow growth rates and first reproduction from eight years of age.

Implementation: To support this population a captive breeding and release program were carried out. An initial stock of 1,152 individuals of Adriatic sturgeon (1,011 class 1⁺ with 40-80 cm size, and 41 adults of 90-120 cm) were obtained from the same fish farm (Azienda Agricola VIP) used in the previous release program. Since 2006, a captive breeding program was established in the Ticino Regional Park, using 10 adults and 50 individuals of class 1⁺ reared in a 300 m x 10 m pool with semi-natural conditions. The release program had two distinct phases: during the Life project (2004-2006) 1,061 individuals of class 1⁺ with 40-80 cm. size, and 24 adults of 90-120 cm. have been released in the Ticino river. All these specimens were marked with subcutaneous PIT tag for individual recognition. Thirty-one adults and 10 class 1+ individuals were also fitted with an implanted transmitter (CTT-82-3 or IBT-96-5; Sonotronics, USA). Following the implant of the tag seven sturgeons died: two for intestinal obstruction by the tag, three for infection caused by loosening of the stitches and two from stress. In 2007, the second phase started, and 1,300 young obtained from the captive breeding program were yearly released in the Ticino river. In 2007: 200 individuals of 10cm size; in 2008: 500 individuals of 12cm size and 100 individuals of 75cm size; in 2009: 500 individuals of 40 cm size.



Adriatic sturgeon (*Acipenser naccarii*)

Post-release monitoring: Monitoring focused mainly on distribution and habitat use of the sturgeons released in the first phase. A total of 421 “capture-recapture” survey both using electro-fishing and radio-tracking activities was established. The data indicated the majority of class 1+ sturgeons migrated downstream to the confluence of Ticino and Po rivers, and only few individuals were located in the same big pools (2 ha x 8 m deep) along the Ticino river chosen by adults. The data from this monitoring program linked to the available scientific information were used to formulate a specific Action Plan including management measures and priority recommendations needed to conserve this sturgeon population. This Plan was endorsed by the regional government of Lombardy. One of the priority conservative measures was the realization of two fish stairs for the Porto della Torre and Panperduto dams, in the northern part of Ticino river; both are under construction and will be ready at the end of 2010. This, with the programmed realization of a fish elevator for the Isola Serafini dam, will contribute to restore the ecological freshwater corridor with the Adriatic Sea. Data from a fish survey in Ticino river underlined the strong presence of the introduced sheat-fish (*Silurus glanis*) and its negative impact on all the autochthonous species. A specific study carried out on a sample of 4,293 specimens of all ages sheat-fish, confirmed that this species can occupy all the habitats suitable for the sturgeon and can prey upon different taxa (invertebrates, fishes, amphibians and also birds). An abundance control program by electro and net fishing was established since 2004, and till now 5,662 individuals (13.30 tons) were removed from the river in 195 surveys. The maintenance of these activities during the time seems to assure good recovery possibilities to the autochthones fish species. In 2009 a small group of young Adriatic sturgeon (25 individuals of about 3 cm) was discovered in the river near Pavia city, confirming the wild reproductive success, 20 years later than the previous one.

Major difficulties faced

- The program needs a long term approach. So it is difficult to obtain the necessary funds to assure the management activities needed by this kind of program.
- The post release contact of individuals marked with a PIT tag, in a vast and complex river like Ticino.
- Complexity of the captive breeding activities for this species.
- To stop the illegal fishing; especially the underwater fishing, very effective on this species. Due to the slow growth rates and first reproduction from eight years of age, the loss of a few potential breeders in the initial project's phase could affect the final result.

Major lessons learned

- These programs are successful only with a very long term approach and with the release of a high number of individuals. So during the time it is necessary to switch the release program in to the Park's ordinary management activities.
- Captive breeding program on genetic basis is essential to support a re-introduction program as well as a natural rearing conditions are essential to produce captive individuals for re-introduction purposes.

- Necessity of specialized structures and high level trained staff to develop a successful captive breeding program.
- It could be more effective to release young sturgeons from class 1⁺: 40-80 cm size minimum.
- It is necessary to implement a program for all target stakeholders especially anglers and this could also discourage illegal fishing.



Ticono river © Ticino Regional Park

Success of project

| Highly Successful | Successful | Partially Successful | Failure |
|-------------------|-------------------|----------------------|---------|
| | √ | | |

Reason(s) for success/failure:

- Colonization of most of the suitable areas of Ticino river, as mandated by the Action Plan.
- Wild reproduction within six years from the start of the release program.
- Establishing of a captive breeding program for reproducer stock.
- The sturgeon program is now part of the management activities carried out by the Ticino Regional Park.
- Realization of two fish stairs for the Porto della Torre and Panperduto dams, so as to establish a freshwater corridor with the Adriatic Sea.

Acknowledgements

We thank Dr. Cesare Puzzi and the staff of Graia group (www.graia.eu) for the invaluable support in the project's development and in the field work.

References

Bernini F. & P. A. Nardi. 1990. Regime alimentare di *Acipenser naccarii* Bp. (Osteichthyes, Acipenseridae) nel tratto pavese dei fiumi Po e Ticino. Boll. Mus. Reg. Sci. Nat. Torino, 8 (1): 429-439.

Bruno S. 1987. Pesci e crostacei d'acqua dolce. Giunti Barbèra, Firenze. Gandolfi G., Zerunian S., Torricelli P. e Marconato A. 1991. I pesci delle acque interne italiane. Ministero dell'Ambiente-Unione Zoologica Italiana, Istituto Poligrafico e Zecca dello Stato, Roma, 616 p.

GRAIA, 1999. Ricerca sulla fauna ittica del fiume Ticino.

Nardi P. A. 1982. I pesci del Parco [della Valle] del Ticino. Fabbri Ed., Milano, 112 p.