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# MAPPING STURGEON FORAGING AREAS IN THE WESTERN BLACK SEA. AN APPROACH FOR INTEGRATING CONSERVATION TARGETS AND SUSTAINABLE MANAGEMENT OF MARINE RESOURCES

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**OVERVIEW** 

Huso huso (Linnaeus, 1758) - beluga

Acipenser gueldenstaedtii (Brandt & Ratzeburg, 1833) -Russian sturgeon

Acipenser stellatus (Pallas, 1771) - starry sturgeon

### Conservation Status of sturgeons in Romanian Black Sea waters

**Beluga** was observed sporadically during the project (catches of 0-3.1 kg/survey).

Unfavourable - inadequate (U1+)

**Russian sturgeon** was the least observed (0 - 0.29 kg/survey).

Unfavourable - bad (U2+)

**Starry sturgeon** was the most abundant (0 - 6.45 kg/survey).

Unfavourable - inadequate (U1+)

#### SPECIFIC ACTIVITY - MAPPING STURGEON FORAGING AREAS

- The area off the Danube mouths (Western Black Sea shelf, Romania) represents a traditional feeding ground of the Family Acipenseridae.
- At the same time, in recent years, the marine zone of the Danube Delta has become targeted by beam-trawl fisheries of the invasive gastropod *Rapana venosa*, with a potential destructive impact on benthic habitats.
- Our study aimed at performing an accurate mapping of sturgeon foraging areas, in order to propose appropriate management measures.
- Zoobenthos samples and stomach contents were analyzed in order to identify the feeding preferences of the sturgeon species investigated.



#### STOMACH CONTENT ANALYSIS BY THE NON-INVASIVE METHOD OF GASTRIC LAVAGE

All investigated sturgeon specimens were safely released after the procedure.



#### **METHODOLOGY**

15 sturgeon individuals were bycaught using trawl/gillnets: 2 **Russian sturgeon** individuals, 4 beluga specimens and 9 starry sturgeon individuals. After lavage, stomach content samples were preserved in 4-10% formaldehyde solution, being later analyzed in the laboratory. The data obtained were statistically processed using **Microsoft Excel and** PRIMER<sup>®</sup>v.7.



Mollusca

73.61%

#### **STURGEON DIET**

The main food items identified in the stomach contents samples collected from the four **beluga** specimens were fish (anchovies, gobies) and mollusks.

> In the stomach content samples collected from A. *stellatus*, a high density of polychaetes was observed, and crustaceans were the second favorite food item

**Zoobenthos samples** Polychaeta Crustacea Mollusca Other groups 87% The food component that dominated in the Russian **sturgeon** stomach content was represented by individuals from the group Mollusca.



#### RESULTS

The mapping of the feeding area for sturgeons was made based on the results obtained from the zoobenthos samples, which were correlated with the diet array obtained from the gastric lavage samples. Polychaetes dominated in the zoobenthos samples in terms of density, as well as the preferred food of A. stellatus. Mollusks and crustaceans were found both in the zoobenthos samples and in the digestive tubes of the sturgeons investigated.

#### DISTRIBUTION OF STURGEON FORAGING HABITATS IN N-W BLACK SEA

A higher concentration of polychaetes (left) and crustaceans (center) was noted in the northern part of the analyzed perimeter, while mollusks (right) had a more uniform distribution throughout the entire area analyzed.

#### RESULTS



#### **CONCLUSIONS & NEXT STEPS**

- Mapping the most important foraging areas of sturgeons and stomach content analysis by gastric lavage bring a novel scientific input to the overall availability of the food supply in the N-W Black Sea area, as well as the feeding preference of the species studied.
- The analysis of the two data sets (stomach contents and zoobenthos samples) clearly indicates that sturgeons can find in the investigated area sufficient food for population recovery.
- Acquiring a sound knowledge of the food items in the investigated area (Danube Delta marine zone/ROSCI0066) is essential, especially for the conservation of the three sturgeon species, but also for raising an alarm signal that beam trawling should be strongly regulated (if not completely banned in certain areas by creating Fisheries Restricted Areas/FRAs wherever vulnerable and/or essential habitats are found). A study for assessing the impact of beam-trawling on these habitats is under preparation.
- Moreover, sturgeon populations are impacted not only by the destruction of their feeding habitats, but also by Illegal, Unreported and Unregulated (IUU) fishing, which is a major issue affecting all Black Sea stocks.
- As such, in order to achieve the reconciling of conservation targets with the sustainable use of marine resources, a stronger control enforcement should be encouraged, reducing the existing pressures on these flagship species of the entire Danube basin.



## **THANK YOU FOR YOUR KIND ATTENTION!**

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