

ECONOMICS

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ASSESSMENT OF SOCIO-ECONOMIC EFFICIENCY OF SUSTAINABLE DEVELOPMENT MEASURES IN THE STURNET PROJECT

Sturgeon species are among the most endangered fish groups in the Danube and Black Sea regions. Their decline is caused by habitat degradation, hydrological changes, overfishing, and by-catch in commercial fisheries. Monitoring conducted within the SturNet project demonstrates strong seasonal and spatial variability of sturgeon occurrence and confirms the importance of sustainable ecosystem management. The research is conducted within the framework of the “Network for the Preservation of Sturgeon and for the Sustainability of the Black Sea Basin Ecosystem” (SturNet, BSB00172) project, funded by the Interreg NEXT Black Sea Basin Program. The goal of the project is to protect and preserve sturgeon in the Black Sea basin.

Project Partnership: OBB (Bulgaria), GeoEcoMar (Romania), ECCC (Moldova), AUTH (Greece), GTU (Turkey). From Ukraine, the official project partner is the State Organization “Institute of Market and Economic & Ecological Researches of the National Academy of Sciences of Ukraine” (IMEER) [1].

The research is based on scientific monitoring field data collected in the lower Danube and Dnipro basins in 2025. The study analyzed seasonal by-catch intensity, spatial distribution of migration corridors, hydrochemical indicators, and socio-economic implications of ecosystem degradation. Cost-benefit analysis and ecosystem services valuation were applied.

As detailed in Table 1, the socio-economic evaluation reveals a direct correlation between the selectiveness of fishing gear and long-term economic risks. The threat ranges from a critical risk to biodiversity caused by small 10 mm trawls destroying sturgeon larvae, to a very high risk from 30–32 mm gillnets that deplete the vital reproductive stock of adult migrants. Conversely, fyke nets demonstrate a low impact with minimal economic consequences.

Table 1

Economic implications of fishing gear types

Fishing gear	Sturgeon target impact	Risk level	Economic consequence
Gillnets 30–32 mm	Adult spawners	Very high	Loss of reproductive stock
Driftnets 20 mm	Juveniles	High	Reduced future productivity
Small trawls 10 mm	Larvae	Critical	Long-term biodiversity decline
Fyke nets	Occasional catches	Low	Limited impact

Source: table was made on data [2; 3]

Monitoring data indicate that the highest intensity of sturgeon by-catch occurred during April and July (Fig. 1). The overlap between migration corridors and fishing zones creates significant ecological and economic risks. Spatial hotspots were identified in the Kiliya branch and Solomonov arm [2].

The analysis in Fig. 1 demonstrates that by-catch has a systematic character and is strongly connected with seasonal migration patterns. April represents the critical period for reproductive adults, while July is associated with intensive juvenile concentration. These findings indicate that existing fishing practices generate hidden economic losses.

Hydrological and temperature conditions significantly influence sturgeon distribution. During periods of low water levels and high temperatures, sturgeons concentrate in deep-water refugia, increasing their vulnerability. Spatial analysis confirms that temperature anomalies correlate with the absence of sturgeons in shallow habitats.

From a socio-economic perspective, the degradation of sturgeon populations affects fisheries productivity, biodiversity conservation, ecosystem services, and regional sustainability. Restoration costs increase substantially under conditions of ecosystem degradation.

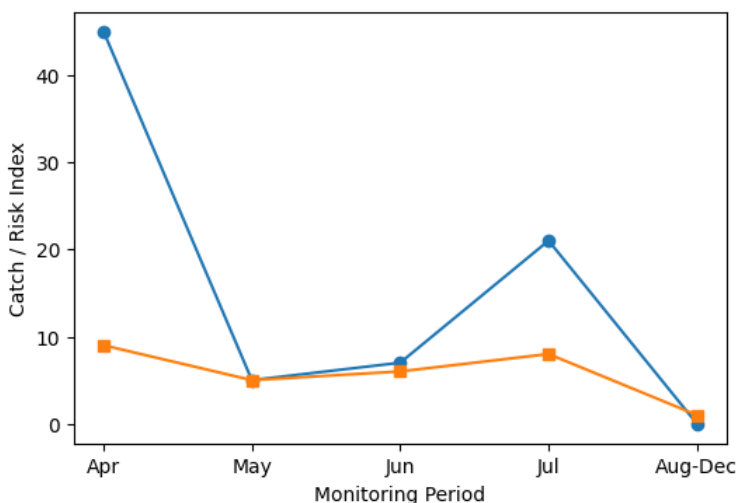


Figure 1. Conceptual relationship between by-catch intensity and ecological risk in sturgeon conservation

Source: graph was made on data [2: 3]

The SturNet project demonstrates the importance of ecosystem-based management approaches consistent with Horizon Europe priorities. Preventive conservation measures, including seasonal fishing restrictions and spatial protection zones, are more cost-effective than restoration programs implemented after ecological degradation.

The integration of innovative ecological monitoring with economic analysis contributes to evidence-based environmental governance and supports long-term sustainable development strategies [4].

The research confirms that sustainable development measures implemented within the SturNet project are economically and environmentally justified. Conservation-oriented innovative management approaches reduce long-term risks and support ecosystem resilience.

The study demonstrates that by-catch generates substantial hidden economic losses, while migration corridors require priority protection and ecosystem services must be integrated into policy-making. Furthermore, spatial and seasonal management measures improve sustainability, and preventive measures prove to be far more efficient than restoring ecosystems after degradation. Serious support for the maintenance and conservation of sturgeons in Europe comes from both the EU institutional framework (for example, the Pan-European Action Plan for the Protection

of Sturgeons) and the implementation of international grants that specialize in innovative and high-tech aspects of biodiversity conservation (including sturgeons) and its monitoring (such as SturNet, MonStur, LIFE-Boat 4 Sturgeon, SOS Sturgeons initiative, etc.). Thus, it is advisable to develop a system of innovative measures to preserve the sturgeon population and achieve the Sustainable Development Goals indicators until 2030, for example, the formation of a national assessment methodology for ecosystem services based on the blue economy compensation model or the creation of a basis for diversifying the fishing community income through the introduction of aspects of social responsibility in fishing activities (rejection of dangerous types of nets, the formation of a culture of banning fishing during the spawning migration period, the development of citizen science among fishermen, etc.).

References:

1. Interreg NEXT Black Sea Basin Programme (2024). Network for the Preservation of Sturgeon and for the Sustainability of the Black Sea Basin Ecosystem. Available at: <https://www.blacksea-cbc.net/interreg-next-bsb-2021-2027/projects/bsb00172>
2. European Commission: Directorate-General for Environment. (2025). *Review of bycatch prevention and mitigation measures for sturgeons : support document for the implementation of the pan-European action plan for sturgeons*. (J. Gessner, editor, B. Striebel-Greiter, ed.) Publications Office of the European Union. DOI: <https://data.europa.eu/doi/10.2779/7698226>.
3. WWF (2024). *Poaching and trafficking is driving sturgeon species towards extinction in the Lower Danube*. Available at: <https://wwfcee.org/our-offices/ukraine/poaching-and-trafficking-is-driving-sturgeon-species-towards-extinction-in-the-lower-danube>
4. Kniazieva O., Neboha T., Golikova O. (2025). Scientific and applied aspects of partnership for the sustainable blue economy development of the Black Sea. *Economic Innovations*, vol. 27(1(94)), pp. 62–69. DOI: [https://doi.org/10.31520/ei.2025.27.1\(94\).62-69](https://doi.org/10.31520/ei.2025.27.1(94).62-69)