

Shadows and Ghosts of the Syr Darya Shovelnose Sturgeon

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We know many things about the Syr Darya Shovelnose Sturgeon. They are the smallest species of sturgeon, growing only 2 feet long. About two-thirds of their length is a long, whiplike tail, and one-quarter is the snout [1]. They spawn in the river they are named for (“darya” means “river” in most Central Asian languages) as it flows from the rugged mountains of Uzbekistan to the Aral Sea in Kazakhstan and Tajikistan. They ride along the current, feeling for small fish and larvae to eat. They are cultural symbols of vitality and wealth, even honored on a Tajikistan postage stamp [2].

What we do not know is whether any are still alive.

The species *Pseudoscaphirhynchus fedtschenkoi* was first described by Karl Kessler in 1872. According to Kessler's notes, local fishermen considered the fish to be the young of the Amu Darya. The Amu Darya Shovelnose Sturgeon is a larger species also found in the Aral Sea and its tributaries. Both species of shovelnose sturgeon have always been relatively rare in these waters. But now, the Amu Darya is critically endangered, and the Syr Darya is lost.

The Syr Darya Shovelnose Sturgeon was last officially seen in 1968. A single fish was caught and reported to the International Union for Conservation of Nature (IUCN) [3]. Four years earlier, the IUCN had established the Red List of Threatened Species. The Syr Darya Shovelnose Sturgeon was added with a Critically Endangered status. The species was also included in the similar Red Book of Kazakhstan. After more than 50 years without proof of life, it might be time to consider them extinct. Recent developments, however, have caused ripples of hope.

What happened to this smallest species of sturgeon?

In the 1960s, the Soviet Union altered the course of two major rivers, the Syr Darya and Amu Darya. They were diverted from feeding the Aral Sea to irrigating the desert plains. The arid land soon turned fertile for cotton farms. But the Aral Sea started to dry up [4].

The Aral Sea is a saltwater lake, previously the fourth-largest lake in the world. Within 30 years of diversion, the lake shrank by three-fourths, becoming three small, separate lakes in the north, west, and east. Barely any water from the Amu Darya and the Syr Darya made it into the Aral Sea.

In 2005, the Kazakhstan government built the Dike Kokaral [5]. Funded by the World Bank, the

Kazakhstani dammed the Syr Darya, refilling the northern lake but effectively cutting off the western and eastern lakes' water supply, condemning them to death by evaporation. Over the following 20 years, the eastern lake, into which the Syr Darya formerly flowed, decreased by another four-fifths [6]. Boats were stranded on the lakebed, still standing today as if waiting for the water's return.

Without freshwater rivers to offset the water lost to evaporation, the salinity of the lakewater tripled. The concentration of pollutants simultaneously increased [7]. Most fish can no longer survive in most remaining sections of the western and eastern lakes.

Sturgeons have another problem. These fish depend on running rivers for reproduction. Their larvae drift in water currents to feed on tiny plankton suspended in the flow. Dams and the reservoirs they create prohibit this feeding technique. The larvae now must spend much of their energy simply staying afloat in the water column, and they cannot eat enough calories to compensate for the energy spent [8].

Dams also harm adult shovelnose sturgeon. A dam stops sediment from continuing to flow down a river. The resulting crystal clear water is not suitable for sturgeon. They evolved to feel around in silty riverbeds for buried prey while the murky water conceals them from potential predators. They are not used to being visible while searching for food [9].

The sturgeon's habitat has all but disappeared.

Not only shovelnose sturgeon were harmed here. Carp, barbel, roach, and other fish species that were once plentiful are now increasingly rare. The fishing industry along the Aral Sea is collapsing, eroding local economies and erasing a way of life.

In 2019, a team of researchers from the Tennessee Aquarium, Eurasian Regional Association of Zoos and Aquariums, and Kazakhstan Fisheries Research and Production Center set out on small boats to search for the Syr Darya's elusive shovelnose sturgeon [10]. They spoke with locals who reported catching the species in recent years. The fishermen accurately described the whiplike tail of the shovelnose sturgeon. There are no other known fish species in the area with this unique body proportion, lending credibility to their claims [11]. Without any photos or remains, however, scientists cannot make an official identification.

The expedition searched above and below the Dike Kokaral dam. Below the dam, they found very few fish of any kind [12]. The water quality was too poor.

Above the dam, however, they did find fish, including a rare species of barbel. The Turkestan barbel, like shovelnose sturgeon, requires free-flowing water in order to reproduce. This section

of the Syr Darya had been actively rehabilitated to increase water flow in the two years preceding the research. The team's finding of young barbel serves as evidence that the habitat can be improved.

Was this action taken in time for the Syr Darya Shovelnose Sturgeon?

In March, 2025, the researchers set out for a second search, this time further upstream. They had received a tip from a local fisheries enforcement officer that someone had caught a "devil fish" with a distinctly whiplike tail.

Local expertise is a vital part of a search for a lost species. The people who fish in these waters know how the river has changed over time and can guide researchers to areas with the best conditions. Relationships between local residents and scientists were critical to searches for other lost species that have recently been rediscovered, such as the Somali Sengi in Djibouti and Omiltemi Cottontail Rabbit in Mexico [13,14].

The sturgeon team searched at 15 sites on their second mission [15]. They used multiple kinds of nets to maximize their chances. Large, funnel-shaped trawl nets and multilayer trammel nets trailed behind the boat to catch adult sturgeon, and circular seine nets were deployed by hand and gently pulled closed to entrap juveniles.

They did not find any shovelnose sturgeon.

The research team has not given up quite yet. During the search, the researchers collected water to later analyze for environmental DNA (eDNA). While a positive result would not prove there is a Syr Darya Shovelnose Sturgeon still alive, finding a trace of their DNA would suggest there was at least one alive within a couple of weeks of collecting the sample. As of December 2025, they are still waiting for the eDNA test results, according to an email from a scientist on the trip.

Compared to 2019, the health of the Syr Darya and Aral Sea ecosystem appeared worse in 2025. There were fewer adult fish, more polluted waters, and poor sediment distribution.

If the Syr Darya Shovelnose Sturgeon has indeed gone extinct, the region may lose more than a cultural icon. The loss of each Aral Sea species poses an additional challenge to those remaining to survive in a rapidly changing environment. As conditions worsen, it will become increasingly difficult to rehabilitate this unique ecosystem.

Finding a living Syr Darya Shovelnose Sturgeon would likewise have broader benefits. The discovery would attract media attention and, in turn, could create opportunities and public pressure for financial investment. Steps taken to protect the sturgeon's habitat, such as

establishing minimum hydropower flows and improving wastewater treatment, would also benefit other aquatic species and the people living in surrounding communities.

Local folklore continues to surface occasional glimpses of a long snout or whiplike tail. For now, they are apparitions. We can't say for sure whether they are shadows or ghosts.

Sources

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