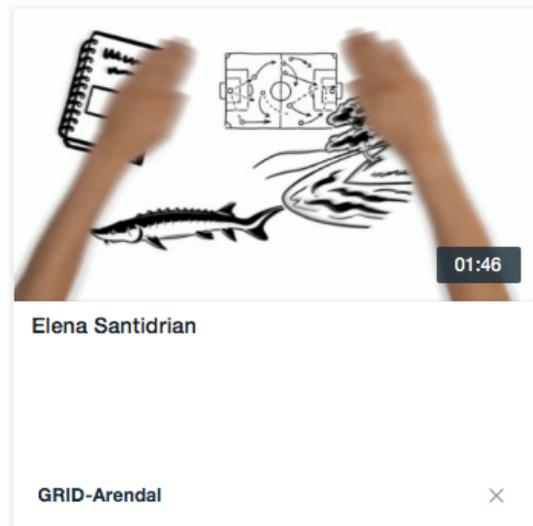


## Unravelling the code

By Elena Santidrián Yebra-Pimentel

In Europe, one third of the freshwater fish species face threats to a certain extent, but the conservation status of sturgeon is specially worrying. That's because seven are critically endangered and one, the Atlantic sturgeon, is extinct in Europe.

Fertilized eggs and larvae imported from Canada are being reared in an effort to restore and conserve the species in the Vistula (Poland) and Oder (Germany) rivers. Biodiversity preservation is necessary to heal the wound that humans have caused for the past 10,000 years to their environment, but in the specific case of sturgeons this duty is not a piece of cake. Sexual maturation takes years and not all the triggering mechanisms are completely understood. Moreover, the juvenile fish conceived in captivity have a handicapped performance when, for the first time, they have to seek food, deal with natural temperature fluctuations or face predators they haven't had contact with in their growing tanks.



[Simpleshow video - https://vimeo.com/271433868](https://vimeo.com/271433868)

Every living thing has in each cell's nucleus all the information needed for building and growing the complete organism. This information is encrypted by a code of letters, called nucleotides, which can be read by a machine called sequencer. These letters are organized in genes and the complete set of genes is called genome, which is nothing but the instruction manual for all the biological processes that take place inside the organism.

In 2003 the Human Genome Project, which mapped the entire genome of one human individual, was released after 13 years of hard work. The result was a genetic instruction manual, referred to as the "reference genome." It has contributed to a better understanding of how we are built and has led to rapid advances in human disease research.

Today, sequencers are able to read this instruction manual faster and cheaper than ever before. Many organisms have been sequenced since 2003, including many fish, but sturgeon is not yet on the list. Since this reference would be very helpful to promote research in the sturgeon conservation field, my main aim in the IMPRESS Project is to create this tool and make it available to the general public.

A reference genome will have many potential uses, from legal applications like tracing the source and species of caviar in the market and aiding conservation through the early identification of matured fish. It will also help select the best mating fish to ensure genetic diversity in the restocking juvenile population or the detection of juveniles with higher survival chances when released in the wild. From the research point of view, it would allow investigating the evolution of the species and the *in vitro* synthesis of sturgeon proteins that can be used in lab experiments to reduce the need for experimental animals.