since the beginning of the 19th century. "Accounting for pre-modern whaling and struck-and-lost rates where whales were shot or harpooned but escaped and later died made us realize the population was more productive than we previously believed," co-author Grant Adams from the University of Washington at Seattle explained.

Based on these death tolls, the model calculations suggest that the population was at around 27,000 in 1830 and remained relatively stable until large-scale commercial whaling in the South Atlantic started in 1905 and also expanded into the feeding grounds at higher latitudes. Unsustainably large numbers were caught around South Georgia, in particular. In just over two decades, the population collapsed from 25,000 in 1904 to around 700 in 1926. The population remained very small for decades, with the lowest point estimated to have been 450 individuals around 1958 — fewer than 2% of its size before exploitation.

Hunting ceased by 1972, and since then the population has recovered to an estimated 25,000 whales or 93% of the abundance in 1830, according to Zerbini and colleagues, who used a combination of air- and ship-based surveys, along with advanced modelling techniques to assess the current abundance. The earlier IWC assessment had estimated a recovery of only 30% by 2005. The authors predict that the whales will have fully recovered by 2030, as long as there is no increase in anthropogenic disturbances, which in their habitat have remained moderate so far. As in 1830, this abundance will likely be close to the carrying capacity of the habitat, as the availability of the krill that the whales feed on may limit their numbers.

Globally, the species has recovered to an estimated two thirds of its pre-whaling abundance, leading to the downgrading of its Red List status, which is now Least Concern.

Thus, even though the situation looks desperate for species like the vaquita and the North Atlantic right whale, it is comforting to know that miracles can happen.

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My Word

The role of scientists in policy making for more sustainable agriculture

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Feeding the growing world population under changing climate conditions, environmental degradation and the recent COVID-19 pandemic poses globally unprecedented challenges on crop production systems that comprise many aspects, such as inputs, management practices, plant protection, soil management and crop varieties. Breeders, geneticists and biotechnologists focus mainly on improving plant varieties through breeding. Since the discovery of Gregor Mendel's laws of inheritance in 1865, plant breeding has undergone many technological breakthroughs, ranging from the ability to make crosses with wild relatives; to mutation breeding since 1920, which increases the rate of genetic variation; and ultimately to modern crop improvement, using technological advances in molecular biology, of which genome editing is the most recent innovation.

As of 2012, genome editing by CRISPR became a game-changing new tool for our understanding of the genetic basis of biological processes. In 2020, the Nobel Prize in Chemistry was awarded to Emmanuelle Charpentier and Jennifer A. Doudna for the development of a genome-editing method using CRISPR[1], highlighting its revolutionary impact. For applications in agriculture, CRISPR emerged as a revolutionary breeding technology that enables the very precise, efficient and cost-effective selection of improved crops (Box 1). Unfortunately, the current European legislation subjects crop varieties obtained using CRISPR under strict GMO regulations, which *de facto* blocks the introduction of genome-edited crops to the EU market. Not surprisingly, the scientific community has been raising concerns on the current EU status of crops obtained through new genomic techniques, which is based on outdated EU legislation that no longer reflects the current state of scientific evidence and progress.

The European Sustainable Agriculture through Genome Editing (EU-SAGE) network[2], representing researchers from 133 leading European plant science institutes and learned societies, is convinced that Europe needs to enable application of genome editing through developing science-based policies. Recently, a report entitled "Genome editing for crop improvement" has been published by ALLEA (All European Academies), in which EU-SAGE was introduced[3]. The report presents the state-of-the-art of scientific evidence and explores paths to harmonize EU legislation with recent scientific developments.

Here, we elaborate on how Europe is lagging behind in embracing the potential of genome editing, and we highlight how scientists can contribute to advising on effective science-based policies for more sustainable agriculture through genome editing.

Box 1. Genome editing for more sustainable agriculture.

Genome editing for more sustainable plant production has the potential to:

- Reduce the number of inputs (water, fertilizer, plant protection products) needed to safeguard crop yields, thereby reducing the amount of greenhouse gas emissions associated with these inputs and the environmental pressure caused by plant protection products.

- Increase the output per unit of land, thereby reducing the amount of arable land needed for food production. The spared land should be used for re-wilding and re-forestation.

- Save crop species in danger of disappearance, local varieties and orphan species, thereby protecting biodiversity and increasing the diversification of agricultural species.