The Downfall of Beluga Whales at our Hands

Kyleigh Ing | 2023

What could have been were it not for human greed; the effects of climate change and pollution.

They were once known as the canaries of the sea; known for their various hums and chirps fishermen stopped to appreciate. No longer are the waters frequently riddled with the vibrant noises of beluga whales. We are the cause of not only our demise, but that of the ecosystems that sustain humanity. Climate change and environmental pollution act as catalysts towards the rapid decline of the beluga whale population.

The effects of climate change and environmental pollution are not only exclusive to belugas. It affects entire ecosystems, disrupting the food chain. Belugas have had to start diving deeper and longer to find their prey and sometimes they are unable to access the surface to breathe. The scarcity of prey has also led to more frequent hunts and immense stress on their bodies. As the numerous changes in a beluga's life occur, they must find ways to adapt and quickly. Stress can cause issues in relation to their already low reproductive rates.

With urbanization, waters have become heavily polluted due to oil and gas development, wastewater discharges and urban runoffs. As belugas are near the top of the aquatic hierarchy, the bottom feeders that have these pollutants stored will accumulate in their blubber reserves.

The toxicity of the pollutants do not directly kill the population but instead make them more susceptible to disease. Between 1983-1990, 33% of belugas suffered from pneumonia. The ingestion of pollutants also bring along immune system deficiencies making them more prone to epizootics (epidemics amongst an animal population).

Belugas are 10-100 times more contaminated than any other marine life studied

It is shown that the belugas inhabiting the St Lawrence Estuaries are seen to have significantly higher concentrations of pollutants than whales in the Arctic. Autopsies show these belugas to contain 1,000 times more dichlorodiphenyltrichloroethane (DDT) and polychlorinated biphenyl (PCB) than the average human. While both these pollutants were banned in Canada, their effects can still be seen decades after use. Additionally, high levels of benzo-a-pyrene and heavy metal concentrations pollute the waters contributing to the downfall of beluga whales.

Benzo-a-pyrene is a byproduct of burning chemicals and have been linked to causing intestinal cancer within these creatures. Moreover, it is one of the most potent carcinogens which can accumulate in a beluga's liver and brain. It does not only affect the current whale population but causes genetic damage that will be copied to each proceeding generation. From 1983-2006, 20% of belugas were recorded to have died of malignant tumors. In contrast, the belugas inhabiting the Arctic were found to have no trace of such carcinogens.

The Saguenay area, which drains into the St. Lawrence, are the breeding grounds for many industrial plants that are known producers of benzo-a-pyrene. In 1984, Greenpeace found Alcan Co. as the imposters of dumping 38 tons of benzo-a-pyrene into the waters each year. In response to the accusation, Alcan Co. was devoted to funding the research of beluga whales. They also vowed to reduce their annual waste by 84%.

Chemical pollutants alone are not the only cause of deaths for these marine animals. It was recorded the Montreal sewage plant was responsible for 1-5% of total heavy metal concentrations in the St. Lawrence River. While some of the metal concentrations are due to natural factors, historical waste

producers are another high factor. In 1978, a chloralkali manufacturing ceased its operations after it was responsible for dumping high amounts of mercury byproduct into the stream.

There are also indirect consequences of pollution, most notably climate change. Warming temperatures and increased precipitation were the cause of growth of toxic algal blooms which was seen in 2008 when a red tide (alexandrium tamarense) spanned 600 square kilometers of the St. Lawrence Estuary. This algae produces saxitoxin which is a neurotoxin that results in paralysis. If the toxin reaches the respiratory system it will cause asphyxiation and ultimately death.

Furthermore, belugas naturally have low reproduction rates as they are mammals and produce few calves each season. However, the St. Lawrence belugas have a reproduction rate of 20% compared to the 66% reproduction rate found in the Arctic beluga population. Every summer the banks of the St. Lawrence River is riddled with a dozen belugas toxified so heavily it is technically illegal for their carcasses to wash ashore. Canadian law dictates anything with a concentration of 500 ppm of pollutants is toxic waste. The belugas examined have been found to have levels ranging from 240-800 ppm.

In response to the numerous deaths of beluga whales, especially in the St. Lawrence region, Canada hopes to increase its historic population by 70%. Their ideal plan includes an annual 4% increase in population making their goal attainable by 2050. However, the population has a current growth rate of 1%, thus their goal would be reached around 2100.

The government banned the hunting of whales without permits as a step to preserve the population. Since the banning in 1979, COSEWIC has reassessed the status of the population and in 2004 belugas in the St. Lawrence Estuary were classified as threatened rather than endangered. In 2018, the Oceans Protection Plan budgeted $167.4 million to be distributed over a five year period. This would fund scientific research to investigate the health factors of whales and analyze the threats that the population is facing.

The sustainable development goal, life under water, set by the United Nations is dedicated to preserving aquatic ecosystems through reducing water acidity and plastic contaminants. The threat to beluga whale populations implies that a greater loss in biodiversity will occur as ecosystems will be set out of equilibrium. The population has been suffering due to human byproducts causing pollution and climate change. A significant change must be implemented so that fishermen can be graced with the inviting sounds of the canaries of the sea.

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