Rocky Harbour Blue Whale Finds a Home at Memorial University

By Nova Hanson & Fiona Cuthbert

Core funding for the restoration of Rocky Harbour whale skeleton was generously provided by Mark & Sandra Dobbin and Craig & Lisa Dobbin, in honour of Eleanor (Penney) Dobbin (Mark & Craig's mother)



7 What Happened to the Blue Whale's Heart?

The heart was shipped with the bones to Ontario and was immediately frozen to prevent further decomposition. After a year at -20 °C the heart was thawed and ready for fixing (preserving the tissue). Placed in a customized stainless steel tank, the heart was soaked in 20% formalin. The preserving solution was also flushed through the heart chambers to displace any remaining water and to retain a dilated (expanded) shape. After 5 months the heart was drained, rinsed, carefully wrapped and shipped to Germany for plastination.

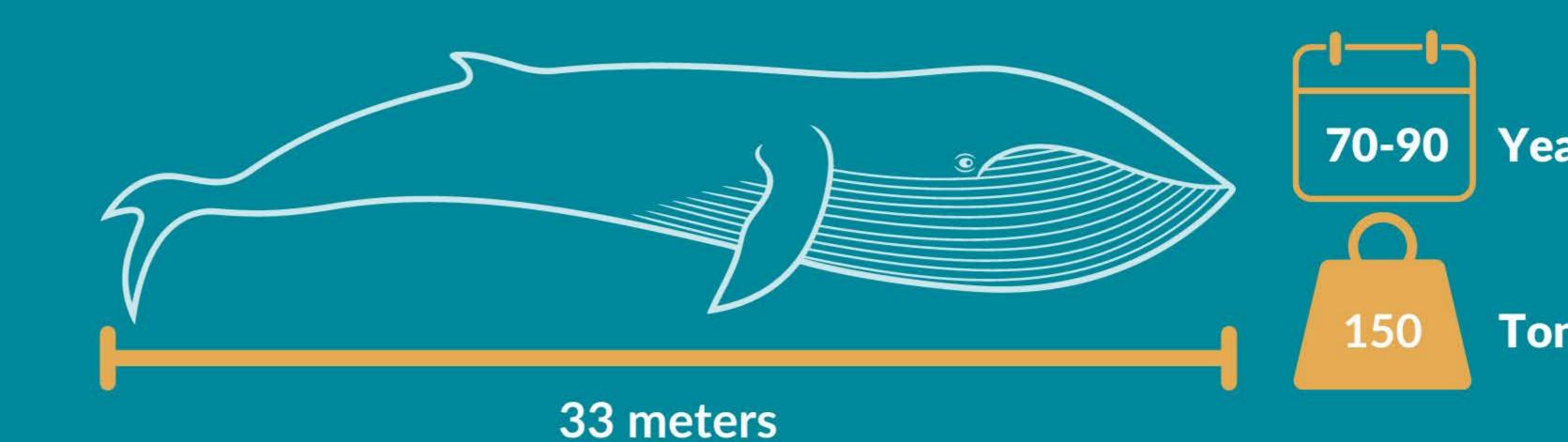
Prior to plastination the heart was dehydrated in five changes of cold acetone (-25 °C, under vacuum) over 42 days, followed by submersion in ambient temperature acetone for an additional four months.

Drained of excess acetone, the heart was placed in a bath of silicon polymer mix at -25 °C. Over 80 days, a vacuum was applied causing the acetone to vaporize and the silicon to be drawn into the cells. After silicon impregnation the heart was shaped and cured (hardened) at ambient temperature for 10 days. The final dimensions of the heart were 96.3 cm wide and 106.2 cm length. It is displayed at the Royal Ontario Museum.



11 The Blue Whale

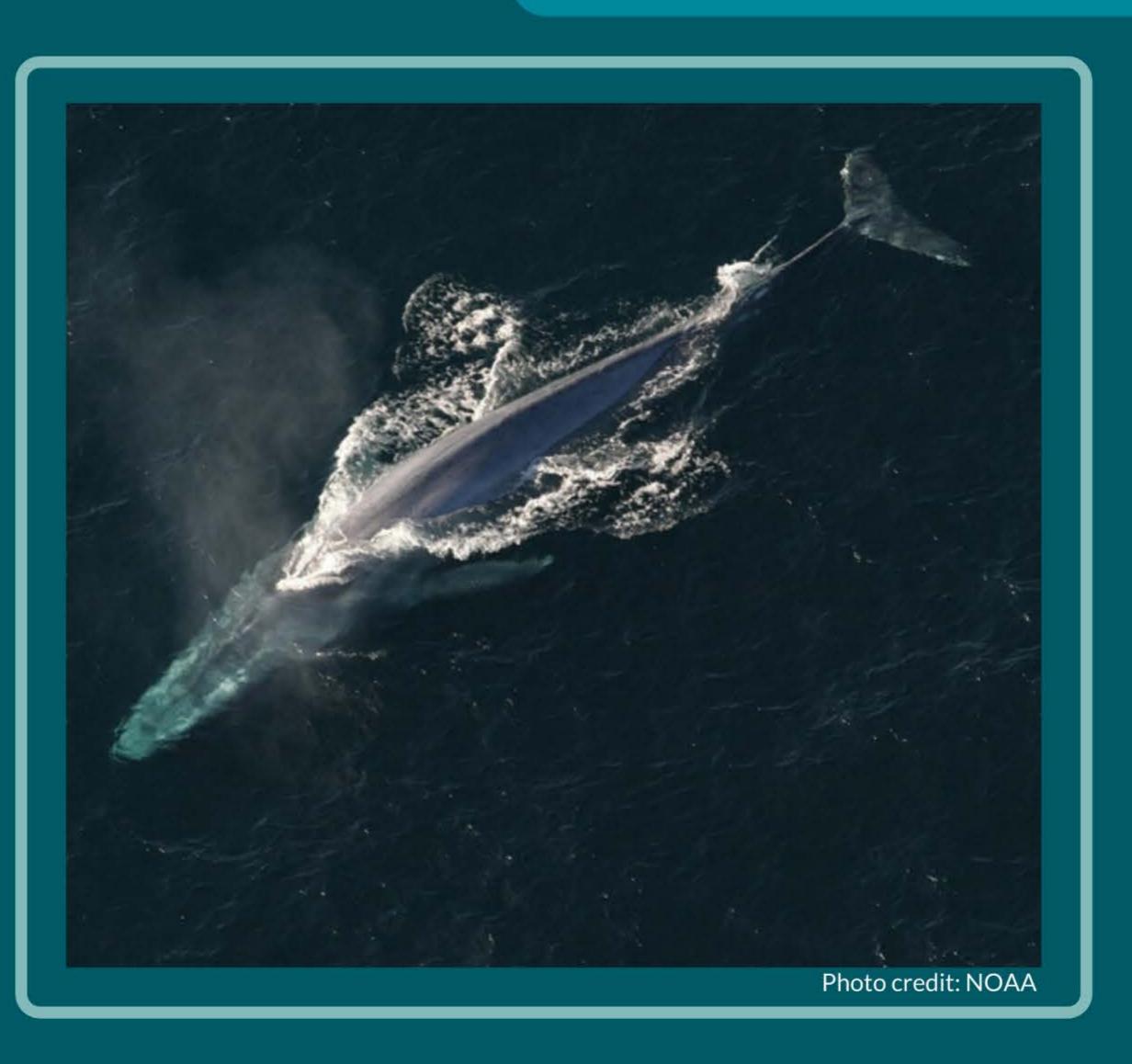
The blue whale (Balaenoptera musculus) is the largest animal that has ever lived, reaching lengths up to 33 meters and weights up to 150 tonnes. They can live between 70-90 years.



Blue whales feed on swarms of small, shrimp like creatures called "krill". Instead of teeth, triangular black plates of baleen hang like vertical blinds from the top jaw. Baleen is made of keratin like fingernails, claws and hooves. Blue whales lunge through the water, their mouths open at 90 degrees and pleated throats expanded to form a gigantic pouch, engulfing schools of krill. When the mouth closes the tongue forces water between the baleen trapping the krill.

Blue whales once numbered 300,000 worldwide. Industrial scale hunting in the 19th and 20th centuries, and more recently entanglements in fishing gear, vessel strikes, noise pollution and the effects of climate change, have reduced that number to 20,000. The Northwest Atlantic blue whale population, estimated to be between 200-400 animals, is designated Endangered.

Scan to learn more!





See blue whales feeding



Memorial University: Raising the blue



Learn more about this

Raising the Skeleton

The skeleton was shipped to Memorial in large, already reassembled sections, with the ribs and smaller bones packaged individually. In mid-summer 2021 it was finally time to raise the skeleton in the 30 meter high main atrium of Memorial University's Core Science Facility. In order to reach the highest points of the atrium ceiling a mobile aerial work platform called a Spider Lift, was sent in from Boston.

A structural engineer designed the lifting points and cables and produced detailed drawings and specifications. Lasers placed at the planned cable points confirmed the skeletons path. Hinged joints along the backbone relieved the stress on the massive structure as it was raised.

Memorial's blue whale is exhibited to represent Memorial's motto Provehito in Altum, Latin for "launch forth into the deep."

2 Death in the Ice

In March 2014 nine dead blue whales were spotted in heavy pack ice in the Gulf of St. Lawrence off the southwest coast of Newfoundland. The whales were most likely crushed to death when strong westerly winds moved the thick ice onshore. Two of the carcasses washed up on local beaches: one in Trout River and a second in Rocky Harbour, two small communities on the west coast on Newfoundland near Gros Morne National Park.

The deaths of the blue whales represented a significant blow to the small Northwest Atlantic blue whale population, perhaps as much as 4% of the total. Both whales were middle-aged females, about 25 meters in length and weighing somewhere on the order of 90 tonnes a piece.

An agreement between the federal government and the Royal Ontario Museum (ROM) allowed for the preservation of both skeletons for study and display. The Trout River whale would find a future home at the ROM. The Rocky Harbour whale would find a home hanging in the main atrium of Memorial University's Core Science Facility.



5 Reassembling the Skeleton

Reassembling a blue whale skeleton is a bit like completing a 356 piece jigsaw puzzle!

A 'pose image' was extracted from video of a blue whale swimming. Each cleaned and dried bone was photographed with a scale bar. The 'pose image' and photographs were imported into a drawing program. Individual skeletal elements were traced, scaled down and arranged over the 'pose image'. From this specifications for the steel framework necessary to support the bones could be made.

Holes were cored into the 62 vertebrae providing a passageway for a 4" diameter steel supporting rod. Each vertebra was secured in position with a custom steel attachment plate. The vertebral column was assembled in 3 large sections each connected with by a hinge. Steel frameworks were constructed to support the rib cage and flippers. Complete reassembly in the RCI workshop took 6

The skulls of both blue whales were heavily damaged in the pack ice. The Rocky Harbour whale's skull was recovered in 3 large pieces. The skull hanging above you is a cast taken from the original bones. Worry about the structural integrity of the massive lower jaws resulted in them being cast as well. The cast skull at 5.5 meters long, had to be brought into the new Core Science Facility during the construction phase of the building so it would fit.



What does the skeleton tell us about our whale?

evident on the some of the vertebrae and ribs. This suggests our whale is a middle-

Our whale sustained a broken left rib evidence of partial healing. It was likely a local blunt force injury greater than a year old, perhaps the result of a vessel

Flensing a Whale Carcass: A Messy Process

In May 2014 the Rocky Harbour blue whale was towed to the slipway beside the public wharf. The whale was measured at 23 meters. A small team from the ROM, Research Casting International (RCI), the company tasked with reassembling the skeletons, and a few local townspeople set about to salvage the bones.

Flensing knives were used to cut through skin, thick blubber and muscles. Internal organs were disposed of with the exception of the heart. As the bones were removed each one was tagged. The bones of both whales, plus the heart of the Rocky Harbour whale, were transported in refrigerated tractor-trailers to the RCI facility in Trenton Ontario.



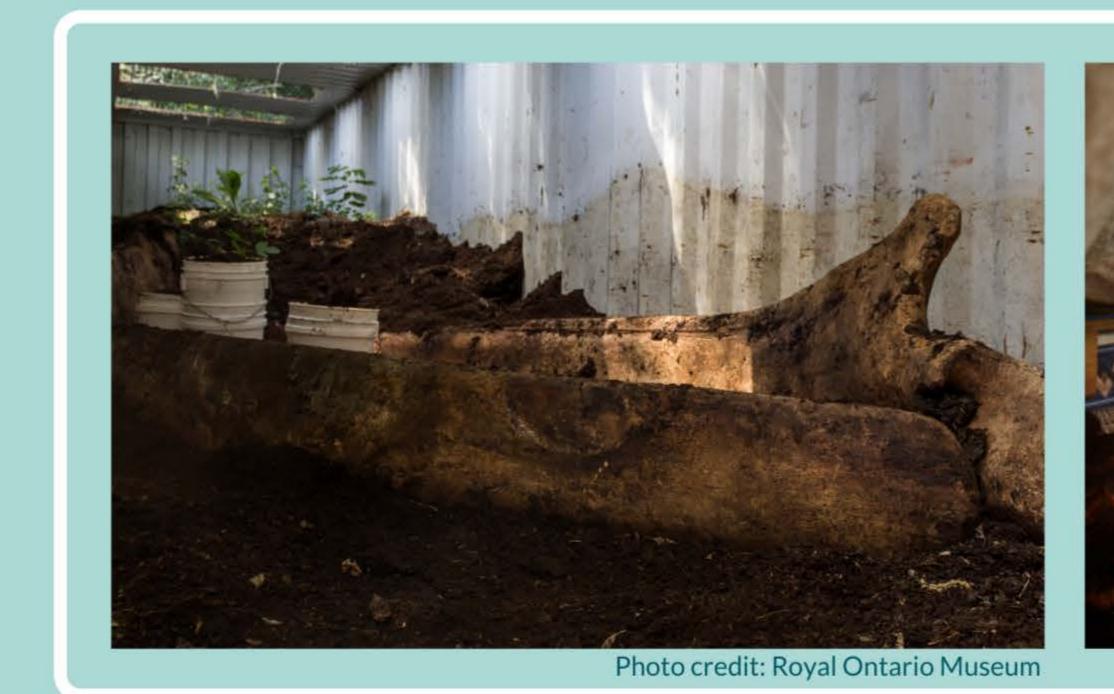
Where did the biowaste go?

How do you weigh a dead whale?

ough in life it would have weighed as much as 275-300 kg.

49 Backyard Composting & Degreasing

Removing the remaining organic matter and degreasing the bones was carried out at the RCI facility in Trenton. Large holes were cut in the tops of the tractor-trailer containers containing the bones and six to eight dump truck loads of manure mixed with sawdust was added. The compost mix also contained weeping tiles so the bacteria could get the air needed to remove the last bits of flesh. Temperatures would get as high as 100 °C during the composting process. The bones sat in compost mix for the best part of two years.





In addition to their thick blubber, whales hold large oil reserves in their porous bones. Much of the oil seeped out during the composting process, but further degreasing of the bones was necessary. Peter May of RCI commented "you don't want oil dripping on people's heads in a museum." In summer 2016 the bones were removed from the compost and loaded into large tented pools where they rested on platforms while a vapour degreaser continually circulated environmentally friendly detergents inside the

Over many months, the sheets of baleen had dried and curled. They were power-washed, and rehydrated in the pools. Once the sheets regained their flexibility, they were pressed and flattened between sheets of plywood. The baleen from the two whales was attached to a cast of the Trout River blue whale's jaws and incorporated into the ROM's Great Whales: Up Close and Personal exhibit.