Whale of an exhibit takes shape

By Jeff Richardson

Above: Aren Gunderson sprays water while others scrub a bowhead whale skull with dish soap outside the UA Museum of the North in summer of 2020. UAF photos by JR Ancheta unless otherwise noted.

Moments after cautiously removing the cover from a foul tank of lukewarm liquid, Aren Gunderson ’07 peered inside and crinkled his eyes.

The coffee-colored stew immediately delivered the sour-sweet smell of decomposition, thanks in part to a bag of rotten whale flesh hidden somewhere beneath the murky surface. A light, oily scum had formed on top.

Gunderson, the mammal collection manager at the University of Alaska Museum of the North, was smiling.

“This is the best part of my job,” he said, grinning behind a mask. “I can’t believe it’s happening.”

Even by the strange standards of 2020, this was quite a summer for Gunderson. He spent the long Alaska days working in a smelly, windowless laboratory at the University of Alaska Fairbanks’ Arctic Health Research Building, surrounded by freezers, vats of mysterious potions and an inescapable funk.

But to illustrate his enthusiasm, Gunderson reached into the liquid and pulled out a prize — a 6-foot bone marked “right rib #6.” It’s just one piece of a bowhead whale skeleton that was donated to the museum soon after the creature was harvested by a Barrow whaling crew in 1963.

Bone by bone, the skeleton is being revived to museum-quality condition after a half-century out of public view. Gunderson is leading that effort.

UA Museum of the North Director Patrick Druckenmiller shows the plans for suspending a reconstructed bowhead whale skeleton from the ceiling of the museum lobby.

The reconstructed skeleton will be suspended from the ceiling at the Museum of the North this spring, towering in mid-dive above visitors as they walk through the lobby. After years of dreams and unrealized hopes, the museum was thrilled when the Bill Stroecker Foundation contributed more than $900,000 last year to make the project a reality.

“We’re about as far from the ocean as you can get in Alaska,” said Patrick Druckenmiller, the museum’s director, “but we’re going to bring a piece of the coastline to the Interior.”

A new role for an old skeleton

It's a remarkable new chapter for the bowhead skeleton, which until now had existed in relative anonymity among the museum's 2.5 million artifacts and specimens. Although its massive skull has been on display in the museum's Gallery of Alaska since 1984, the rest of the skeleton has been shelved away from public view in a room-temperature storage area. The specimen was identified simply by its catalog number, UAM 15988.

The skull of bowhead whale specimen UAM 15988, the larger of the two shown, is displayed in the natural history wing of the museum in June 2020.

There have always been big hopes for the specimen, even if they'd gone largely unrealized. Those dreams may have even originated with **Bill Stroecker '42**, a local banker and museum supporter who died in 2010. The lifelong Fairbanksan frequently talked about the visual impact of a whale skeleton hanging near the entrance, providing a memorable, massive greeting for visitors.

"Ever since there's been a museum, we've thought, 'Wouldn't it be great to have a whale skeleton here?'" Druckenmiller said. "Who knows who the first person to think about it was, but the idea has been out there a long time."

The generous contribution from Stroecker's charitable foundation, which was finalized in January 2020, didn't just push that vision forward — it also presented a set of big challenges, quite literally, for the museum and its staff.

Bones of specimen UAM 15988, a bowhead whale, await three-dimensional scanning at the UA Museum of the North in 2013.

For the display to work, those old bones — which had yet to be fully cleaned — needed to be transformed into the museum's new centerpiece.

It's not an easy task, said Lee Post, a Homer-based naturalist who is assisting with the project. Not surprisingly, whale remains can be pretty disgusting.

Unlike the bones of their terrestrial cousins, marine mammal skeletons are saturated in oil. Unless they're cleaned properly, they tend to become stinky and sticky as

time passes. Some whale skeletons that were mounted in the late 1800s are still oozing their greasy contents today.

“There aren’t many places that have taken bones this old and this dried up and can display them in a way that isn’t gross,” Post said.

‘Cutting edge, experimental stuff’

Gunderson’s typical approach to articulating an animal skeleton would employ a colony of hungry beetles to clean away the flesh. But the bones in a marine mammal are too much for the bugs, who respond to the high-fat diet like they’ve eaten a big Thanksgiving dinner. The sluggish beetles not only bog down on the greasy flesh, but even under ideal circumstances they couldn’t do anything to break down the oil inside.

The state-of-the-art technique for leaching out that fat is to bury the bones in horse manure, Post said. The mix of hungry microbes in that culture can usually pick a skeleton clean and consume most of the oily residue in about a year. Some restorers have also had success by putting skeletons in crab pots and dunking them in the ocean, letting marine organisms dine on the organic remains.

Neither of those options are especially suited to Fairbanks, which doesn’t offer easy access to an ocean or

consistently warm soils.

Instead, Gunderson spent much of 2020 on a low, slow cookout in a new lab space in UAF's Arctic Health Research Building. Using a pair of 800-gallon vats filled with oxygenated water, he gave each piece a four-month rancid bath. A ravenous mob of microorganisms, spurred into action by a donated chunk of rotten sperm whale jaw, gradually polished the bones inside and out.

The bowhead cranium, which has continued to ooze a few drops of oil per year while on display, was dusty but otherwise judged to be fairly clean. To prepare it for display, the skull was repeatedly scrubbed with soap and hot water in the museum parking lot to break down any remaining greasy residue.

Top: Aren Gunderson holds a bowhead whale rib during cleaning in the basement of Arctic Health Sciences Building. Bottom left: Gunderson returns a scapula to a tank. Bottom right: Gunderson displays the scapula.

“There are other ways to clean oil from whale bones — with solvents, steam, and pressure — but given enough time, nothing is so thorough as bacteria,” Gunderson said. “It just requires a tolerance for the smell that most specimen preparators prefer to avoid.”

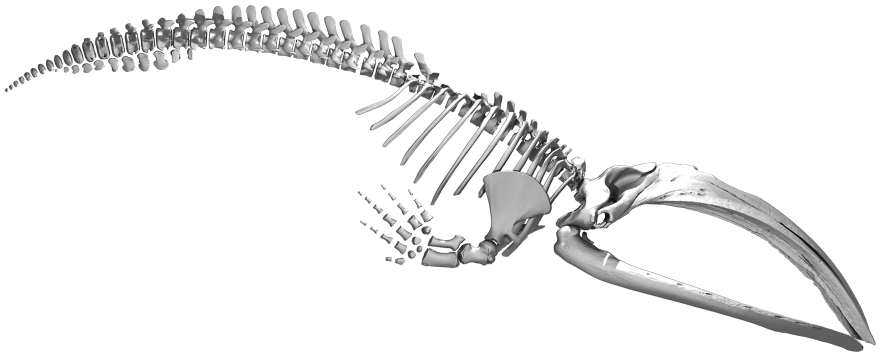
After being thoroughly cleaned, parts of the bowhead whale skeleton temporarily sit inside the museum auditorium in January 2021.

After a final cleaning with soap and water, the skeleton had new life. Post, who has written a series of books about articulating mammal skeletons, was impressed, describing Gunderson's technique as "cutting-edge, experimental stuff."

It also required a little substitution, since the donated skeleton is slightly incomplete. Museum staff located those missing pieces from a mounted whale skeleton in Iceland and other bowhead bones in the museum's collection. Using computerized scans, they were able to replicate a jawbone, parts of a flipper, and 16 vertebrae in the tail with a 3D printer, turning their own skeleton into a complete model.

Gunderson said his work restoring UAM 15988 has been a career highlight. And despite the challenges, so far it's largely gone according to plan.

"It's been a pretty long process, but I can't think of anything unexpected that's happened," he said.



A side view of bowhead whale specimen UAM 15988 from a digital rendering. Image courtesy of the UA Museum of the North.

A whale of a project

Creating a whale skeleton display doesn't stop with restoring the bones.

Post, who will temporarily relocate to Fairbanks early this year to help museum staff piece the creature together, estimates it will take seven weeks to mount the skeleton on a steel frame. Once it's complete, the whale will be as long as a bowling lane and weigh as much as a small car.

Druckenmiller, whose academic background is in paleontology, said even he finds the scope of the project intimidating.

“I work with dinosaurs, but I’m still kind of blown away by the size of whales,” he said. “Most dinosaurs are puny by comparison.”

UA Museum of the North Director Patrick Druckenmiller, center, and Link Olson, curator of the museum's mammal collection, scrub the cranium of specimen UAM 15988 with soap outside the museum in August 2020.

The bowhead cranium alone weighs 900 pounds — one of the largest heads in the animal kingdom — and the entire skeleton will be about a ton when the cleaning process is complete.

Hanging it above the museum's lobby required the addition of a 45-foot beam that spans the ceiling, as well as the reroute of some utilities.

"The weight of that huge head requires some extra engineering and creativity," Post said. "If you're suspending

it over the heads of people in earthquake country, you want it to stay there."

The installation will be unique because of its proximity to a staircase and lookout above the lobby. Visitors will be able to view it from below, above and the side, making it the only bowhead skeleton in the world that provides so many vantage points. Small but fascinating details — including the harpoon wound on its back that ended its life — will be available for visitors to see from just a few feet away.

The skeleton will be accompanied by interpretive panels, which will provide information about bowhead whales from the perspectives of both natural history and Alaska Native culture. Druckenmiller hopes the display will give visitors new insight into subsistence whaling and its role in Alaska's history.

Construction began Dec. 21 at the UA Museum of the North, where the bowhead whale skeleton will be suspended from the ceiling this spring. The temporary wall will be torn down after the installation.

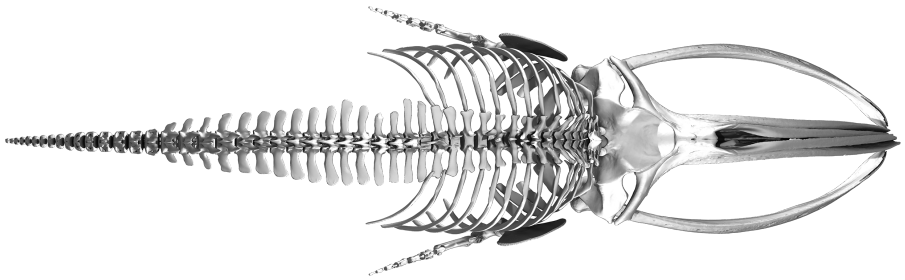
The bowhead skeleton will also become an educational tool beyond the walls of the museum, which already boasts the largest collection of marine mammals in North America and possibly the world.

Link Olson, curator of the museum's mammal collection, oversees its growth, maintenance and use by the global scientific community, as well as its use in outreach and exhibitions. Olson said he can't wait to use the skeleton in future classes, and he expects other instructors will do so as well.

“Not only will this instantly become one of our star attractions, it will be an invaluable and unparalleled teaching resource,” said Olson, who teaches mammalogy in the UAF Department of Biology and Wildlife. “Whales and their relatives represent one of the most remarkable evolutionary transformations known, and being able to view the end result mere feet away will definitely make an impression.”

When the new whale display is unveiled this spring, it will represent the end of a long journey for both the bowhead skeleton and the museum. After decades of dreaming and planning, Druckenmiller believes it will be worth the wait.

“Museums around the world would be jealous of this spot,” he said. “I don’t know how you could have designed a better space. The whole effect is going to be really stunning.”



A top view of bowhead whale specimen UAM 15988 from a digital rendering. Image courtesy of the UA Museum of the North.