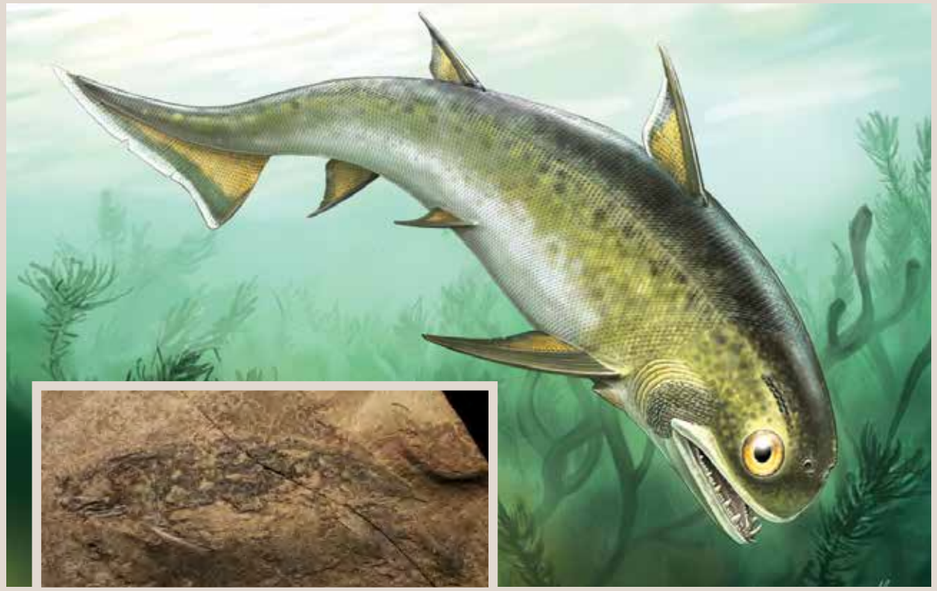


Inset: The right half of Carl's "spiny shark" fossil, *Nerepisacanthus denisoni* (112 mm long), as reassembled for study.

Left: Artist's reconstruction of the appearance of *Nerepisacanthus denisoni* in life.

Photos: Carl Fechko by Samuel Ciurca.

Silurian Fish
A story about the one that *didn't* get away!

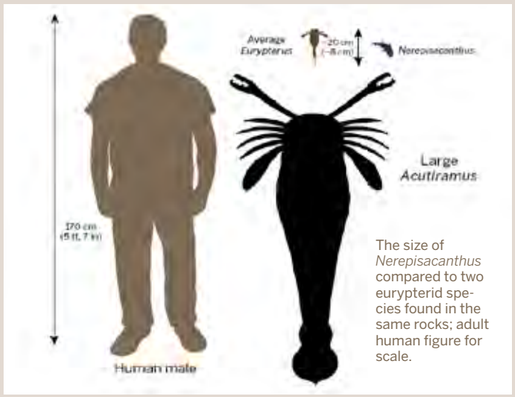
On a sunny Autumn day in 2011, Carl Fechko—a dedicated amateur fossil collector from Ohio—was carefully chiselling up slabs of Silurian-age (formed about 420 million years ago) bedrock from a southern Ontario quarry floor. Along with his fellow hobbyists, Carl was on the hunt for elusive eurypterids, an extinct group of aquatic arthropods (joint-legged invertebrates) distantly related to living horseshoe crabs and scorpions. The rare and highly prized fossil remains of eurypterids occur in very few places, and almost always to the exclusion of other kinds of fossils. Finding a complete eurypterid in this quarry is rather like locating a stony needle in a 420-million-year-old haystack, but Carl's next chisel split revealed something even more unexpected.

There, on the freshly exposed rock surface, was what appeared to be a small fish! Although the evolutionary origins of fish and fish-like animals can be traced all the way back to the Cambrian Period (about 515 million years ago), those earliest primitive vertebrates were soft-bodied and lacked many of the features (including scales, bony bits, and jaws) that characterize the later fossil record. It wasn't until sometime around 440 million years ago, near the beginning of the Silurian Period, that the record yields tantalizing but rare and fragmentary evidence that jaw-bearing fishes had evolved. As it turns out, Carl had serendipitously uncovered the most complete fossil of an early jawed-fish known anywhere in the world! With the assistance of other flabbergasted collectors, both split halves of Carl's discovery were photographically documented and extracted in several pieces. And there on the spot, in consultation with his fellow collectors, Carl made the decision to donate what they all recognized as a potentially significant discovery to the ROM's palaeontology collections.

Carl Fechko next to his discovery.

Fast forward almost three years. After an intensive period of study, spearheaded by early fossil fish expert Dr. Carole Burrow of the Queensland Museum in Brisbane, Australia, a description and discussion of the importance of Carl's extraordinary find appeared in the journal *PLOS ONE* on August 5, 2014. The little fish, measuring just over 11 centimetres in length, belongs to an extinct group called the Acanthodii (colloquially, the "spiny sharks"). It is not only the oldest known intact fossil of a jaw-bearing fish, it is also the first of its kind to be described from Ontario rocks. There is still much to be learned from, and about, this diminutive Silurian predator that shared the seas with much larger eurypterids, and it is all thanks to Carl Fechko's discovery and generous donation of his unintended catch to the ROM.

DAVE RUDKIN is assistant curator of Invertebrate Palaeontology in the ROM's Department of Natural History.



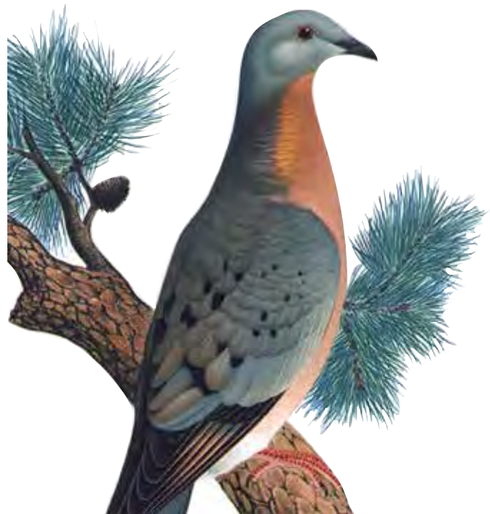
The size of *Nerepisacanthus* compared to two eurypterid species found in the same rocks; adult human figure for scale.

Diagram: TK. Pigeon illustration: TK.

Programs
De-Extinction Dialogues

As the debate rages over the human impact on ecology, scientists unanimously agree that we have entered the sixth mass extinction event in the 3.5-billion-year history of life on Earth. The last major extinction event earth saw was 65-million years ago, and resulted in the loss of the dinosaurs.

What does extinction mean? If, as researchers believe, 99 percent of all species that ever lived are extinct, why should we be concerned? Can human ingenuity and innovation change the definition of extinction? On September 26, the ROM Centres of Discovery for Biodiversity and Contemporary Culture will attempt to tackle these questions in a novel and surprising way: by intertwining art, science, and culture through special programming and lectures.



MUSICAL PERFORMANCE

A Mourning Chorus
6:30 p.m. (TBC), Schad Gallery and Queen's Park Rotunda
Open to the public with Museum admission

A collaboration of the ROM with the AGO, and seven female singers, this performance will explore the sounds of disappearing North American songbirds through the historic framework of women's public mourning rituals.

TICKETED LECTURES

A Feathered River Across the Sky: The Passenger Pigeon's Flight to Extinction
Joel Greenberg, 7:10 p.m., Bronfman Hall

Joel Greenberg, a research associate at both the Field Museum and the Chicago Academy of Sciences, and arguably the world's expert on passenger pigeon natural history, will introduce his newest book and speak about the importance of the ROM's own collection of passenger pigeons, which is the largest in the world.

De-Extinction: Bringing the Passenger Pigeon Back to Life
Ben Novak, 7:45 p.m., Bronfman Hall

A revolutionary among contemporary biologists, Ben Novak, a geneticist with the Revive and Restore Project, will present his controversial proposal on the process of placing the complete genome of the passenger pigeon within an extant species with the goal of resurrecting the extinct passenger pigeon. Novak, who used ROM passenger pigeon DNA to sequence the genome, will present in TED Talks format.

The Centennial biodiversity gallery intervention exhibition—***100 Years of Silent Springs, the extinction of the Passenger Pigeon***, showcases 10 ROM passenger pigeon specimens as well as 11 other species of endangered or extinct birds. Level 2, Gallery of Birds