

Without missing a beat, she rhymes off a number of species that stand to be affected by the potential quarry: scarlet tanagers, pileated woodpeckers, raptors, various frogs, red newts, Jefferson and yellow-spotted salamanders, and green sunfish.

The threats posed to habitats and species by the Nelson Aggregate quarry proposal, however, are only the most recent focus of Harmer's conservation work. Having grown up in the region, the 41-year-old singer-songwriter has long been involved in efforts to maintain the natural status of the escarpment, which has been designated as a UNESCO world biosphere reserve.

Seven years ago, she helped co-found an organization called PERL (Protecting Escarpment Rural Land) to raise funds for and promote awareness of local conservation issues. Among Harmer and PERL's latest projects is an interactive website, DrawnToTheWild.org. Visitors to the site are invited to grab a frame from the video for the title track of Harmer's *I'm a Mountain* album and sketch their own lines or images on top of the frame. The illustrated frames are then recompiled to produce a new version of the video.

Better yet, a conservation program called the Big Wild, run by the Canadian Parks and Wilderness Society and Mountain Equipment Co-op, donates 25 cents to PERL for each submitted frame. "It helps really get the word out about the escarpment," Harmer says of the project.

The income is welcome, too, Harmer adds. "That small amount of money helps pay our very large bills." Indeed, challenges before the OMB do not come cheap. Nor are the outcomes certain. The hearings on Nelson Aggregate's quarry application concluded in February, and the tribunal is expected to make its ruling later this summer or in the early fall. For her part, Harmer is optimistic about the outcome. She's also hopeful that Drawn to the Wild will continue to shed light on the escarpment, its habitat and its wild inhabitants.

And while it's unlikely the OMB will consider the lyrics of "Escarpment Blues" as evidence, it might consider their warning. Sing's Harmer: "If they blow a hole in the backbone, the one that runs across the muscles of the land, we might get a load of stone for the road, but I don't know how much longer we can stand." 🌀



What's good enough for Microraptor...

Mysteries abound in the fossil record of a small, feathered dinosaur — a creature that is both fantastical and familiar

By Jay Ingram

OLD AND NEW

Microraptor made news recently when scientists discovered that its feathers shared characteristics with feathers of modern birds, especially in the ability to create colour. The question is, what did Microraptor — a creature unlike today's birds in so many ways — do with this ability?

Microraptor was a common, small dinosaur that lived 120 million years ago, leaving behind hundreds of fossils in the fabulous Liaoning bone beds of northeastern China. The animal itself is intriguing to the point of bewilderment, but in the bigger picture it is a beautiful example of evolution's tinkering — some innovations last, some don't. The result is that this creature is both alien and familiar, all at once.

Microraptor was the size of a crow, with an outsized tail longer than its body, and was covered with feathers, not just on the body, but on forelimbs and hindlimbs, too. Many kinds of feathered dinosaurs have been identified; some gave rise to birds, some didn't. It's not always clear what role their feathers played, although in Microraptor's case they have, especially on the limbs, aerodynamic features that suggest they were used to help the creature get airborne.

But what sort of airborne are we talking about? The feathered hindlimbs have proven to be a challenge: one computer simulation suggested Microraptor glided like a biplane, with



Dinosaur life just got harder

It may have been the crash of a large meteorite that led to the extinction of the dinosaurs during the Cretaceous period 65 million years ago. But life was no cakewalk in the millennia leading up to that event, according to new research. Among the top dangers: wildfires.

British scientists studying charcoal plant remains from the period have determined that wildfires were widespread during the Cretaceous era, likely due to a warmer atmosphere that was also richer in oxygen.

The consequences for the dinosaurs were significant, and not just for the threat of burns. The fires would have burned off plant life at a greater rate than today, which also would have increased runoff and soil erosion. That, in turn, would have led to a greater risk of flooding after storms.

its 'arms' representing the top pair of wings, and the 'legs' the bottom, allowing it to move through the air from tree branch to tree branch. Bird-like but still a dinosaur. Even though this technique has been likened to the Wright brothers' biplane, it's not clear that this is the way *Microraptor* actually soared or fluttered. One thing does seem clear: this animal did not fly as gracefully as a modern bird.

Microraptor's feathers were in the news again a couple of months ago when an international team of scientists discovered arrays of materials in them that are known to create colours in modern birds. The blue of a blue jay, for instance, is not caused by a blue pigment, but instead by interference with light as it passes through the feather (an idea first suggested by Sir Isaac Newton). In *Microraptor's* case, the refracting materials are laid out in a way that would create the same sort of glossy iridescence that we see today in crows or grackles.

That is remarkable: here is an animal, not a bird, whose feathers have the same sort of iridescence as birds living more than a hundred million years later. Why has this characteristic endured? Iridescence today is known to be a crucial part of mating displays. Was *Microraptor's* long glossy black tail perfect for showing off to eligible females? The scientists who authored the iridescence study sure seem to think this is exactly what *Microraptors* were doing, although *how* the animals might have displayed their tails is a puzzle. That full-body array of feathers might have been a huge obstacle to walking around, with feathers scraping on the ground.

So maybe *Microraptor* males did their tail-flipping display up in the trees. Did they spend all their time there? You might be able to tell from what they ate, but here the evidence is scant. For instance, there are two *Microraptor* fossils containing traces of

the animal's last meal. One was a bird, apparently swallowed whole and head-first, the technique used by many bird-eaters today. It was a perching bird, not one that would have spent much time on the ground. The other last meal was a small mouse-sized mammal, whose foot was probably capable of climbing. So did *Microraptor* catch and eat these on the ground, or somewhere above? We really have no way of knowing.

The elusiveness of hundred-million-year-old knowledge is a hazard of the profession of studying long-lost creatures. For instance, one study claimed the anatomy of the eye socket of *Microraptor* suggested it was nocturnal. But iridescent feathers would have to be seen to be appreciated, and they wouldn't do their glossy thing in the dark. Which is true?

No matter what, we have here an amazing beast, a strange animal, a very ancient one, but one that possessed many features that would endure all the way to the present. Feathers? Yes. At least a limited ability to fly or glide? Absolutely yes. Swallowing birds head-first? Yup. Eating both birds and mammals? Sure. Hauling around a very long tail for display purposes? Still going strong. Creating iridescence by the arrangement of particles? Yes.

And yet all these modern body parts and habits were housed in a dinosaur the size of a crow with feathers on all four limbs. To us, *Microraptor* would be an absolutely fantastical being. On the one hand you feel a kinship with the beast because today's crows, grackles and ravens show off the same way it did. But the creature itself? It might as well be from another planet. It is this clash of the familiar and the foreign that makes *Microraptor*—and many of those long-extinct creatures—so appealing today. 🦖