RESERVOIR LOGS
Harvesting the world's underwater forests
Deep below the surface of Lake Kenyir, a 161-square-mile (417-square-kilometre) reservoir in Malaysia, a novel piece of underwater technology is in the unlikely process of uniting two old adversaries, the timber industry and environmentalists. The chainsaw-wielding ROV, called the Sawfish, is hard at work in the lake’s dark waters harvesting trees lost to a 1980s’ hydroelectric dam project.

Measuring 3.5 metres long by two metres wide by 1.5 metres high, the Sawfish weighs 3.5 tonnes on land and is slightly buoyant in water. The vehicle, a marriage of underwater and logging technology, is the brainchild of British Columbia-headquartered Triton Logging. Operated from the deck of a barge, it is equipped with sonar, eight video cameras and a 75-horsepower electric motor aided by seven directional thrusters.

Because waterlogged trees don’t float, the ROV fixes a reusable 650-pound (295-kilogram) air bag to a tree before it is cut. Once the chainsaw has sliced through its base the tree rockets to the surface where a tugboat pulls the tree from the water and stacks it on a floating bunk.

The Sawfish represents the first true arrival of viable marine technology in underwater forests,” says Triton. “It is the world’s only deepwater logging machine, combining proven elements from timber-harvesting and submarine vehicle technology on an innovative platform.”

As a result of the massive dam projects of the 20th century, there are tens of thousands of submerged forests around the world. In this oxygen-deprived environment, wood-decaying fungi and microbes are unable to attack the树木, but they do decay the wood, creating a layer of nutrients for the lake’s inhabitants.

An eco-friendly ROV is harvesting the world’s long-forgotten underwater forests, writes Daniel Johnson.

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The vehicle uses a grapple to latch onto submerged tree trunks and a 55-inch (140-centimetre) waterproof chainsaw that can power through an underwater log in seconds.
to attack the wood, leaving it in a non-living, but preserved state. Some estimates put the price of this timber, around 300 million trees, at US$50 billion (GB£25 billion).

This resource has remained largely untapped as companies have struggled with how to harvest the water-bound wood. Traditionally, the harvesting has been carried out using divers to attach lines to trees which are then pulled to the surface by cranes. A time consuming, manpower intensive and dangerous method, it is also limited to about 25 metres below the surface. As around 80% of the world's submerged trees are located in waters deeper than 25 metres, Chris Godsall, the founder and CEO of Triton Logging, spent the early part of this century developing a method of harvesting these deepwater logs. The fruit of his labours was the Sawfish.

The ROV's first trial was in August 2002 at Ootsa Lake, which lies about 750 miles (1210 kilometres) north of Vancouver, British Columbia. The reservoir was formed in 1954 when Alcan, Canada's largest aluminium company, built a hydroelectric dam there to power a smelter. Millions of lodgepole pine, spruce, Douglas fir and hemlock trees were flooded in the valley behind the dam wall.

"The first tree was cut and everybody cheered," recalls Godsall of the trial. "We cut another tree and again everybody cheered. Then we cut a third tree and the Sawfish broke and everybody went home."

OPERATES
Godsall adds that other setbacks during the vehicle's R&D phase included exploding airbags and tether lines wrapped around branches. However, with these and...
Triton’s vice president, marketing and communications. By adding both third-party certification and a unique story to its wood, Hayhurst says that Triton’s products are considered a form of currency that reduces the cost of marketing for “green” developers and manufacturers.

With offices now on three continents, Triton has expanded operations around the world to meet the growing interest from reservoir managers, governments and forest industries. The lucrative markets, says Hayhurst, are in Central and South America and South East Asia where “underwater hardwoods have ten times the value of Canadian softwoods”. Operations in Malaysia have already produced valuable tropical hardwood species such as merbau, meranti and balau.

Hayhurst says Triton has categorised each of the most promising reservoir opportunities in the world – in their search for underwater forests, the Triton team will study pre-flood photos and maps, use specialised sonar and software to verify tree volumes and then send down underwater cameras to catalogue the species – and has been invited by authorities to “populate these opportunities with the Triton team and system”.

If the company gets its way, the next decade or so could see schools of Sawfish converging on the millions of submerged trees around the globe. The world’s long-forgotten underwater forests are waiting to be harvested.

"It isn’t only the quality of wood but it’s the enhanced story of the wood that makes it popular"