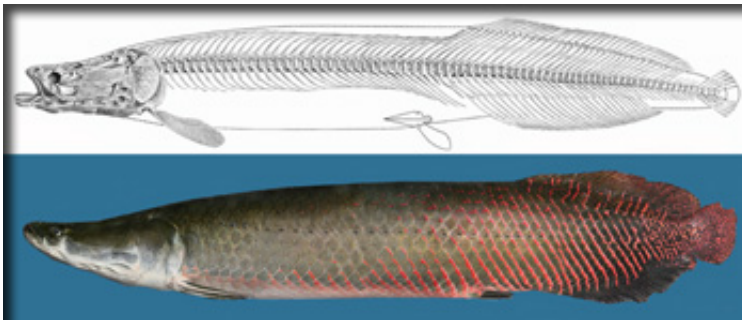


ESF scientist rediscovers long-lost giant fish from Amazon

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(Phys.org) —A professor at the SUNY College of Environmental Science and Forestry (ESF) has put aside nearly a century and a half of conventional wisdom with the rediscovery of a species of giant Amazonian fish whose existence was first established in a rare 1829 monograph only to be lost to science some 40 years later.

Dr. Donald Stewart, a fisheries professor at ESF, found evidence in the monograph of a second species belonging to the genus *Arapaima*, air-breathing giants that live in shallow lakes, flooded forests and connecting channels in the [Amazon River](#) basin.

For 145 years, biologists have thought that *Arapaima* consisted of a single species whose scientific name is *A. gigas*. But Stewart rediscovered a second species that he describes in the March issue of the

journal *Copeia*, published by the American Society of Ichthyologists and Herpetologists.

"In a sense, this forgotten fish has been hiding in plain sight in this old monograph but that monograph is so rare that it now resides only in rare book collections of a few large museums," Stewart said. "I was truly surprised to discover drawings that revealed a fish very different from what we consider a typical *Arapaima*."

Part of the apparently rare fish's story remains a mystery, however, as scientists don't know if it still exists in the wild. "Scientists have had the impression that *Arapaima* is a single species for such a long time that they have been slow to collect new specimens. Their large size makes them difficult to manage in the field and expensive to store in a museum," Stewart said.

Arapaima can grow to three meters in length (about 10 feet) and weigh as much as 200 kilograms (440 pounds).

This different species was originally named *A. agassizii* in 1847 by a French biologist but a catalog published in 1868 considered it to be the same species as *A. gigas*. That second opinion was widely accepted and, since then, no scientist has questioned that view.

But Stewart has had doctoral students studying the conservation of *Arapaima* in both Brazil and Guyana. For those studies, it was important to be clear about the taxonomy of the fishes being studied in each country. In an effort to determine if they were really all one species, Stewart began to review taxonomic literature from the early 1800s, including the monograph that was published the year Andrew Jackson was inaugurated as the seventh president of the United States.

"What is remarkable is that this fish was not re-discovered swimming in

the Amazon but, rather, on the pages of a rare monograph from 1829 that described its anatomy in great detail," Stewart said.

The fish described in the monograph had been collected in the Brazilian Amazon about 1819 and carried to Munich, Germany, as a dried skeleton. There the Swiss biologist Louis Agassiz, who was just beginning his career and later became a professor of zoology at Harvard University, supervised a technical illustrator in drawing the complete skeleton in great detail. At that time, however, he applied the name *Sudis gigas* to the drawings. That rare skeleton was in a museum in Germany until World War II, when it was destroyed by a bomb dropped on the museum.

"To this day, we do not know the precise locality where the fish was collected because the German scientist who collected it died before indicating where he found it, and nobody has found a second specimen," Stewart said. "So, all that exists to know the status of *A. agassizii* is the original drawings of its bones."

Stewart said those drawings reveal numerous distinctive features that leave little doubt it should be considered a valid species. Those features include details related to the fish's teeth, eyes and fins.

The previously recognized *Arapaima* species is known by the common names "pirarucu" in Portuguese and "paiche" in Spanish. Because they rise to the surface to breathe every 5 to 15 minutes, they are easy to locate and fishermen harpoon them to sell their valuable meat or to feed their families. That combination of high value and vulnerability has led to widespread depletion of their populations and they are now listed as endangered.

The mystery surrounding the recently rediscovered fish's current status is not surprising, Stewart said, because there are still vast areas of Amazon

basin where no specimens of Arapaima have been collected for study.

He expects the diversity of the genus to increase further with additional studies. Two more previously described species - *A. arapaima* from Guyana and *A. mapae* from northeastern Brazil but outside the Amazon basin - also should be recognized as valid. He is working on redescrptions of those species. He also has another paper due to be published soon that describes a new species of Arapaima from the central Amazon. That latter paper will bring the total number of Arapaima species to five.

He anticipates that more [species](#) could be discovered as [biologists](#) working in South America begin to make new collections in unstudied areas.

Provided by SUNY College of Environmental Science and Forestry

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