



Searching for *Allotoca meeki*

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Photographs by the author except as noted



A male *Allotoca meeki*.



A female *A. meeki*.

Members of the subfamily Goodeinae of family Goodeidae comprising some 40 species and about 80 distinct populations—are endemic to Mexico, and most are at risk in the wild due to water pollution, habitat degradation and destruction, and predation by introduced species. This is the case with *Allotoca meeki*, a livebearing fish originally described by Dr. Jose Alvarez del Villar in 1959 and named in honor of ichthyologist Seth Eugene Meek. This fish was historically found in the endorheic basin of Lake Zirahuén, including its smaller tributary, Lake Opopeo, in the state of Michoacán, Mexico. Unfortunately, the species is likely no longer present in Lake Zirahuén, presumably due to the introduction of the largemouth bass (*Micropterus salmoides*) as a food fish for local residents, which has also been introduced into Lake Opopeo. As a result, *A. meeki* is one of the most at-risk wild goodeid species.

An International Symposium

I was able to attend the joint XIV Congreso de Sociedad Ictiología Mexicana y III Simposio Latinoamericano de Ictiología (XIVth Congress of the Mexican Society of Ichthyology and IIIrd Symposium of Ichthyology of Latin America) and the International Symposium on Fishes held in Morelia, Mexico, in early November 2014. The convention was attended by well-known scientists and hobbyists from the US, Europe, Mexico, and Latin America.

As part of the convention, the Goodeid Working Group (GWG) held a one-day meeting that was attended by members of the European Goodeid Working Group (EGWG) and the North American Goodeid Working Group (NAGWG). It also included a visit to Fish Ark Mexico, an aquatic conservation breeding facility founded by Omar Domínguez at the Universidad Michoacana de San Nicolás de Hidalgo in Morelia.



Goodea atripinnis.

Rediscovering *A. meeki*

In 1998, Domínguez rediscovered *A. meeki* while working with a colleague in Lake Zirahuén. Prior to this discovery, the species was thought to be extinct in the wild. *A. meeki* and *Goodea atripinnis* were found in the lake, although only *A. meeki* was found in the outflow. Subsequent sampling in 2001 and 2005 found *A. meeki* in the lake and the outflow, although this was the last confirmed occurrence of the goodeid there. Lake Zirahuén and its outflow were again sampled in 2011, but despite an extensive search, none were found in the lake.



The introduction of largemouth bass (*Micropterus salmoides*) in the type locality of *A. meeki* has decimated this species's population.

However, *A. meeki*, *G. atripinnis*, and one *Alloophorus robustus* specimen were found in the outflow.

Sampling Lake Opopeo

Since Lake Opopeo had not been sampled in several years, an impromptu trip was arranged at the symposium to determine the current status of *A. meeki* at its last known location in the wild. Our small party of intrepid goodeid enthusiasts drove to the lake, which was about an hour outside of Morelia. Upon arrival, we began to sample both the lake and its small outflow stream. We found frogs and tadpoles within the plants along the perimeter, but no goodeids. The small outflow from the lake, which is only about 200 feet (61 meters) in length before becoming congested with riparian vegetation, was in a degraded state. Not only was the stream clogged with refuse, but it was being used by the residents to wash their clothing, so there was also soap residue in the water. In fact, while we were sampling in the stream, a woman came and began washing her family's clothing in it.

After about 30 minutes of sampling, several specimens of *A. meeki* were netted, including an adult male, a very gravid female, and several juveniles. We were relieved to find that the environmental conditions and the apparent population size of the species was roughly the same as what was observed in 2001, although the situation for *A. meeki* continues to be dire in this habitat.



Lake Opopeo, Michoacán, Mexico.

Raising *A. meeki*

As part of continued joint studies and conservation initiatives, Fish Ark Mexico donated several young juvenile *A. meeki* to NAGWG for export. I was fortunate enough to obtain these juveniles, which are now adults. The pregnant specimen spawned while being held in quarantine, and her fry are now under the care of a dedicated NAGWG breeder.

While the continued presence of *A. meeki* in the wild is uncertain, there are a handful of GWG members in Europe and the US who—along with the captive breeding facility at Fish Ark Mexico—are dedicated to long-term breeding and maintenance of this and other goodeid species.



Two wild-caught *A. meeki* in the author's home aquarium.
