

But that Darter looks just like that One!!!!

By Stephanie Hunczak

There's a new fish in Georgia? But haven't we discovered all the fishes there are to discover? Especially in a river that researchers and fisherman frequent? It seems unlikely, but new fish are discovered around the world all the time. Many of those new species are found in common rivers and streams that have been explored for many years. So why are these new species being discovered just now? These species are what the scientific world knows as *cryptic biodiversity*.

"The Halloween darter is a great example of 'cryptic biodiversity' -- species that have gone unrecognized because they look a lot like other species that are known," explained Dr. Mary Freeman, an ecologist with the U.S. Geological Survey and the UGA Odum School of Ecology.

Freeman and her husband, Bud, discovered the Halloween darter in the Flint River System in the early 90's. Often times the subtle differences are what distinguish a new species from other existing similar species. The Halloween darter is distinguished from other Percina species by having the following: slightly connected membranes covering the gills; a smooth bone between the cheek and the gill cover; a well-developed bridge of flesh connecting the upper lip and snout; seven closely spaced rectangular dorsal saddles; subconical snout with a prominent eye bone; first-dorsal fin with a yellow-orange to orange band below the margin in mating males and females. With differences as subtle as this, it's no wonder the Halloween darter escaped our attention for so long!



Figure 1. *Percina nigrofasciata*, black banded darter. Source: <http://www.samford.edu/schools/artsci/biology/zoology/vertzoo-05s/pages/6.htm>.



Figure 2. *Percina crypta*, Halloween Darter, Photo taken by Dr. Mary Freeman. Source: <http://www.ovpr.uga.edu/news/article/20090106-darter/>

Can you guess which fish is the black banded darter and which is the Halloween darter?

Finding new species has a tendency to create mixed emotions among politicians and scientists because of the implications it can have on how natural resources are used. Since the Halloween darter requires habitats with swift water currents over rocky areas known as shoals, it is common only to a few areas of the Chattahoochee and Flint River Systems. With this new information, actions will most likely be taken to protect some of these areas from overdevelopment and pollution—and this could interfere with the agenda of businesses in the area.

"Keeping track of the status of the Halloween darter, along with other species that require shoal habitats in the Chattahoochee and Flint Rivers, will provide information on how shoals as ecological systems are responding to changes in land use, water management and climate," said Freeman.

The external similarities could easily confuse anyone, but these two fish do have another similarity with much more importance. They both indicate how healthy an aquatic ecosystem is. As an intolerant genus of fish, darters respond to chemical, physical, and biological degradation in characteristic response patterns. Any type of pollution affecting any one of these characteristics (including changes in pH, decrease in dissolved oxygen, sedimentation, decrease in stream flow, and decrease in aquatic insects) will cause this fish to lose population numbers. And if a stream environment starts to lose darters in large numbers, then that's a clue that something is wrong with the ecosystem.

What it looks like:	Striking black and orange coloration of mating individuals (colors associated with Halloween). According to Dr. Mary Freeman, the Halloween darter has larger, more closely spaced blotches or "saddles" on the top of the fish (the dorsal side) than the Black-banded darter, as well as bands on the pectoral fins. The Black-banded darter's pectoral fins are clear. When breeding occurs in the springtime, male and female Halloween darters have an orange band in the spiny dorsal fin.
Where it lives:	The new species inhabits relatively swift flowing areas over bedrock or a mixture of coarse (boulder to gravel) bed sediments.
What it eats:	The darter feeds on aquatic insects.
What makes it unique:	The unique coloration and its status as an indicator species makes this fish a very important fish in the Oconee area.
Why it is endangered:	The darter is an indicator species because it needs swift flowing streams with relatively little pollution in order to survive. With more and more areas increasing land development that can allow for more pollution in nearby streams, many species of darter are now endangered.
What is being done to help it:	There are many government restrictions to limit development nearby streams, including how close construction companies can develop near any rivers or streams. There are also many entities that monitor areas where there are known endangered darter species to keep tabs on these important populations.
How can we help:	We can help by limiting our own water pollution, water use, and recycle when it is possible.

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