Candy darter

Etheostoma osburni

Anglers Can Help!
Dump your unused bait into the trash not the water. Transferring your live bait fish from one stream system to another can upset natural fish communities and may lead to the decline of some species, including the candy darter.

Visit the waters of Virginia and West Virginia's upper Kanawha River Basin, and you might find yourself witnessing flashes of underwater rainbows. With their vibrant teal, red and orange colors, candy darters are a small freshwater fish native to the Gauley, Greenbrier, and New River watersheds. Although darters in general make up 20 percent of freshwater fish species in North America, candy darters are found nowhere else.

Darters are an integral part of freshwater stream environments, and they also help other species in their life processes. For example, darters may aid in the reproduction of freshwater mussels – important filter feeders that keep rivers clean – by helping transport mussel glochidia (larvae).

Darters are also an important link in the aquatic food chain, feeding on smaller organisms before they themselves are eaten by larger fish.

Underwater Rainbows

The candy darter is small, measuring only 2-3 inches (55-86 millimeters) in length. This colorful fish prefers shallow, fast flowing stream reaches with rocky bottoms.

Candy darters live up to 3 years and begin breeding around 2 years of age. Spawning in mid- to late spring, candy darters are brood-hiding, bottom spawners. Females select areas of finer pebble and gravel among riffles to deposit their eggs.

Following a review of the best available scientific information, the U.S. Fish and Wildlife Service has proposed to list the candy darter as threatened under the Endangered Species Act. Nearly half of the 35 known candy darter populations have disappeared since the species was first described in 1932.

T. Travis Brown

Named for their vibrant colors, male candy darters have five black saddles along their backs and nine to 11 vertical bands that alternate red-orange and blue-green along the sides of their bodies. Though females maintain a similar marking pattern, they appear mostly olive green and black.

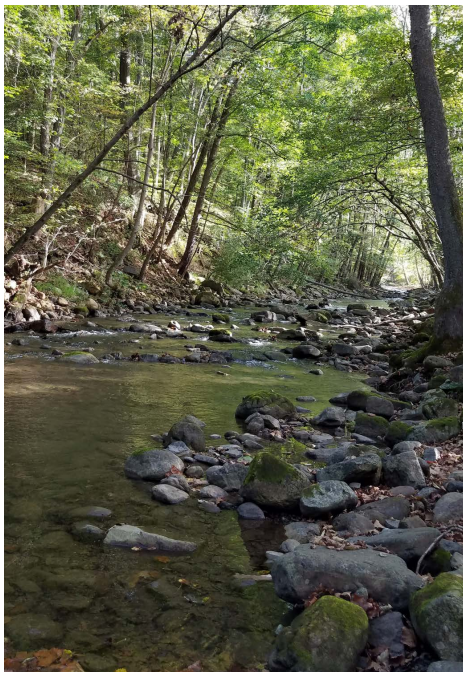
Male candy darters display aggressive, territorial behavior during spawning. After nipping and chasing away competitors, the larger male successfully fertilizes the eggs. Incubation lasts five to 25 days depending on water temperature. Adult candy darters do not care for their young after spawning.

Candy darters primarily feed on small insects such as mayflies and caddisflies.

Vanishing Act

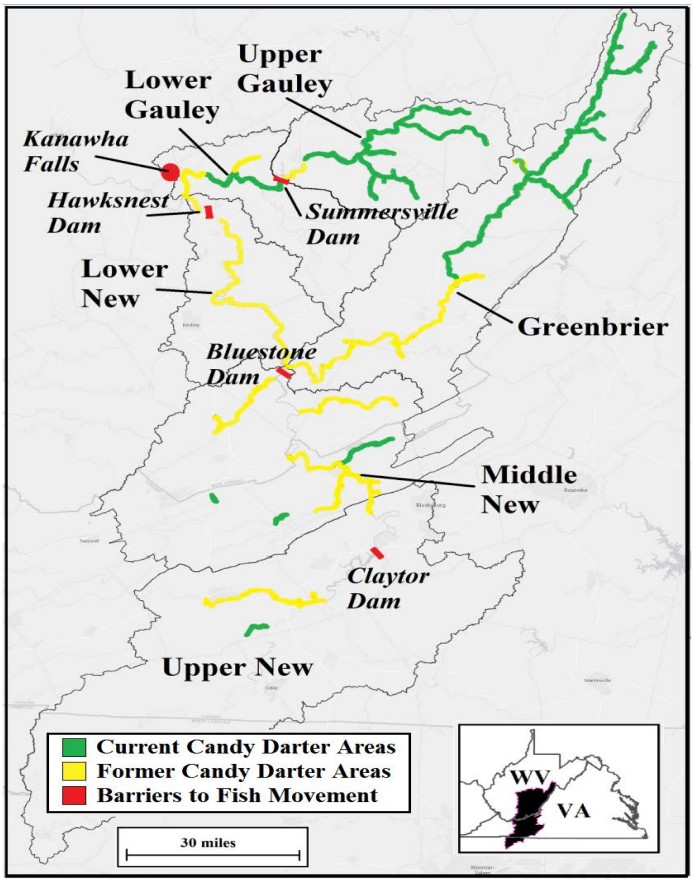
Candy darters were likely once relatively common throughout their range. Historical habitat degradation and fragmentation led certain populations to dwindle or even cease to exist. Nearly half of the 35 candy darter populations known when the species was first described in 1932 have now disappeared.

Now, an emerging threat is causing some remaining populations to disappear right before our eyes. The culprit? Introduction of another darter species.



Krishna Gifford/USFWS

An example of stream habitat for the candy darter species in the Middle New River watershed in Virginia.



Hybridization and habitat loss have reduced candy darter presence in streams in which they were historically found. Green indicates existing populations and yellow indicates former candy darter areas in Virginia and West Virginia.

Dr. Stuart Welsh/USGS

As generations of hybridization progress, candy darter genes become increasingly diluted. Male candy darter (top); male hybrid specimen (middle); male variegate darter (bottom).

"May be the most vivid freshwater fish in North America."
- A Field Guide to Freshwater Fishes, Page and Burr 1991

Slightly larger in size, the variegate darter appears to outcompete candy darters for space, food, and mates.

But most critically, the closely related variegate darter and candy darter can successfully mate with each other. This results in fertile hybrid offspring that are neither pure candy darter nor pure variegate darter.

After multiple, quickly successive generations of this mixing, candy darter genes are effectively diluted out of the population, and only variegate darters remain.

How did variegate darters become a problem for candy darters? Variegate darters were once naturally blocked by the Kanawha Falls from traveling upstream to candy darter populations. But in the late 20th century, variegate darters were released above the falls, likely as a result of their use as live bait for fishing.

While variegate darter hybridization is ongoing in the Greenbrier and Lower Gauley candy darter populations, large dams prevent the natural spread of variegate darters into the candy darter populations of the Upper Gauley and Middle New River watersheds. Preventing the transfer of live baitfish into these watersheds is vital to the continued existence of candy darters in these areas.

Like many other darters, candy darters need very specific habitat features to survive and reproduce. Their presence generally indicates good water quality because they are affected by excessive sedimentation in rivers and streams. When sediment is released, it can fill the spaces between river bottom rocks, sometimes totally burying the gravel, pebbles, rocks and cobble that candy darters use for shelter and egg laying.

Other ways you can help candy darters:

- Safely and properly dispose of household and industrial chemicals so they do not run directly into streams, and report chemical spills to state environmental protection agencies.
- During timber harvest, construction or other projects, implement best management practices for sediment and erosion control.
- Start a watershed group or assist in stream and water quality monitoring efforts.
- Plant trees and other native woody vegetation along stream banks to help restore and preserve water quality and prevent erosion.
- If you reside on property that borders a stream or other waterway, minimize use of chemicals or fertilizers.
- Maintain a buffer of natural vegetation along stream banks to help control erosion and reduce runoff.

U.S. Fish & Wildlife Service
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