THE FRENCH CREEK watershed

A COMMUNITY TREASURE

The Darters of French Creek

FACT SHEET

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Photo courtesy of Ohio Division of Wildlife

Introduction

A hidden world lies beneath the flowing waters of French Creek—a world of vibrant colors and swift movement. Here, among the sand and rocks, small, brightly-colored fish called darters make their home. Relatives of the yellow perch and walleye, darters are one of the Creek's most striking species, rivaling even the most colorful coral reef fish of the tropics. Aptly named, these fish dart from one spot to another, seeking prey or trying to avoid capture.

French Creek has a surprisingly diverse collection of these fish, with 15 species of darters inhabiting the watershed. Several of the species, including the **eastern sand darter** (Etheostoma pellucidum) and **bluebreast darter** (E. camurum), are listed as endangered or threatened species in Pennsylvania. In fact, there are now several species of darters, including the Tippecanoe darter (E. Tippecanoe), which cannot be found anywhere else in Pennsylvania except French Creek and the upper Allegheny River.

Scientists divide the 146 species of North American darters into two categories, or genera, —Etheostoma, and Percina—based primarily on body characteristics. All species are linked by certain similarities related to these body characteristics, but habitats and methods of reproduction vary among individual species. Distinctively colored and marked, each is unique in appearance, giving rise to such descriptive names as **banded darter, greenside darter, and rainbow darter.**

Habitat, Range, and Distribution

Darters are found throughout North America in the Mississippi River System and drainages of the Great Lakes, Hudson Bay, and Atlantic and Pacific coasts. Although many species can be found throughout Pennsylvania, French Creek is one of the only locations where so many can be found together. The most abundant of the darter species are the **banded, rainbow and greenside darters**, but ecologists studying the Creek have found up to 13 species within a single riffle, a stretch of stream where the water's surface is choppy.

Most darters require clean running water, which provides an abundant food supply of midges, mayflies, and additional insects. Larger darters can eat snails, crayfish, and other small crustaceans. If the water becomes stagnant or polluted, food supplies are diminished and compromise the darters' ability to survive. Because of their sensitivity to pollution, darters serve as good indicators of water quality (see box below).

What is an "Indicator Species"?

Some species of plants and animals are more sensitive to pollution and habitat change than others. These "indicator species" are usually the first to be affected when their habitats are disrupted by natural or human-caused disturbances. The identification of these species is very important because they provide ecologists with the perfect tool for measuring the health of an ecosystem. By monitoring the populations of fish such as the **longhead and gilt darters** (two of the most sensitive darter species), scientists are better able to keep track of French Creek's relative water quality.

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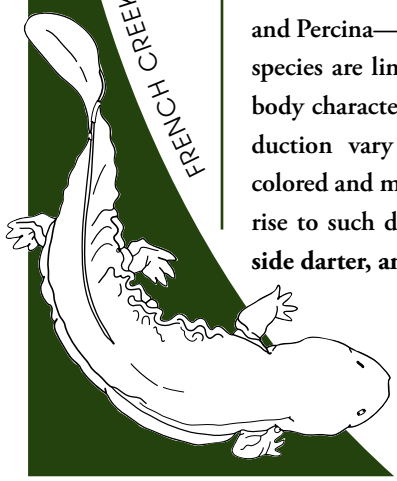

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Egging Them On

Although trickery is not usually the best policy, it works well for the fantail darter. A female fantail is more likely to breed with a male that already has eggs in his nest, because this is a sign that he possesses the physical fitness to protect the eggs to maturity.

Based on this female tendency, fantail males during spawning season develop fleshy, yellowish knobs on the ends of their dorsal fins—knobs which look remarkably like darter eggs. The males then conceal themselves between rocks exposing only these knobs and lure the females towards the nest which appears to be full of eggs. In this way, female fantails are "fooled" into laying their own eggs in a males nest.

Dining with Darters

These tasty morsels — Mayfly Larva (left) and Midge Larva (below)— are a major food source for most Darters.

Courtship and Reproduction

The typical life expectancy for darters is about three to four years. Most reach sexual maturity at one year of age, although egg production increases with age. Mature females of some darter species can produce up to 1,000 eggs.

Darters exhibit a variety of spawning behaviors. The females of some species attach their eggs to underwater vegetation or rocks. Others bury the eggs in the substrate (under the stream bottom) and do not return to care for them. In still other darter species, the male takes an active role, building a nest to attract one or more females. Many of the darters, especially the males, become much more brilliantly colored during spawning season, and some males perform a "courtship dance" to entice potential mates.

Female spotted darters deposit eggs in a wedge-shaped mass under rocks, which are then guarded by the males. This guarding of the eggs by males is a common trait among several darter species.

The bluebreast darter exhibits a rather unique spawning behavior. First, the female of the species entices the male with quick movements and leads the male on a chase. Then she returns to his nest and deposits as many as 100 eggs. The female spawn with the same male several times, or she may choose different males.

Body Description

Darters are broken down into two categories, or genera—Percina and Etheostoma. In general, the genus Percina contains the more primitive and larger species of darters. These species are marked by a row of enlarged, specialized scales on the underside of the belly. Percinal also have a swim bladder, a gas-filled sac, which establishes buoyancy and enables them to maintain their vertical position in the water.

Etheostoma is the largest genus of North American fish. These species lack Percina's specialized scales on the midline of the belly and, most importantly, have no swim bladder, which allows them to spend most of their time on the bottom of the stream. Many bottom-dwelling darters also possess a flat, sloped head shape which helps them to stay near the bottom as the current presses against their head.

That's About the Size of It

Darters can be as small as 1.5 inches (4 cm.) long, and rarely get longer than 7 inches (18 cm.). The eastern sand darter and Tippecanoe darter are the smallest in Pennsylvania and the logperch and greenside darter are the largest.

Relatively Speaking

All 146 species of darters are contained in the family Percidae. Although darters are small in size, this family also includes much larger species such as the yellow perch (above), sauger and walleye.

Percina of French Creek: "perch-like"

COMMON NAME	SCIENTIFIC NAME	STATUS IN PA	HABITAT	BODY DESCRIPTION
Blackside Darter	*P. maculata*	Stable	Pools of creeks with moderate current	Olive-colored with black spots; grows 4 inches
Longhead Darter	*P. macroephala*	Endangered	Scattered rocky riffles in the Allegheny River & French Creek	Brown, black, and white; grows 5 inches
Gilt Darter	*P. evides*	Threatened	Rocky riffles in French Creek & upper Allegheny River	Green with bright orange; grows 4 inches
Logperch	*P. caprodes*	Stable	Medium to large streams and lakes with vegetation	Tan with long & short brown bars on back & sides; grows to 7 inches

Etheostoma of French Creek: "sieve mouth"

COMMON NAME	SCIENTIFIC NAME	STATUS IN PA	HABITAT	BODY DESCRIPTION
Banded Darter	*E. zonale*	Stable	Rocky riffles of creeks and small to medium rivers	Yellow-green in color; grows to 3 inches
Bluebreast Darter	*E. camurum*	Threatened	Swiftly flowing waters of upper Allegheny River & French Creek	Blue-green body with blue breast and dark stripes; grows to 3 inches
Eastern Sand Darter	*E. pellucidum*	Threatened	Sandy bottoms of lakes, rivers, & a few places in French Creek	Pale yellow and silver; grows to 3 inches
Fantail Darter	*E. fabellare*	Stable	Shallow riffles, or along banks in fast or quiet water	Dull brown with striped tail; grows to 3 inches
Greenside Darter	*E. blennioides*	Stable	Rocky riffles of creeks & shores of large lakes	Yellow-green with green bars; grows to 6½ inches
Iowa Darter	*E. exile*	Candidate	Slow flowing streams and glacial lakes	Red-orange, with dark spots; grows to 3 inches
Johnny Darter	*E. nigrum*	Stable	Sandy and muddy pools of creeks	Brown X's or W's on side; grows to 3 inches
Rainbow Darter	*E. caeruleum*	Stable	Fine gravel riffles, very rarely found in standing waters	Red, green and blue; grows to 3 inches
Spotted Darter	*E. maculatum*	Endangered	Deep riffles in French Creek & upper Allegheny River	Dusky with small red spots; grows to 3½ inches
Tippecanoe Darter	*E. tippecanoe*	Endangered	Clear riffles of French Creek with gravel	Orange with vertical bands; grows to 2 inches
Variegate Darter	*E. variatum*	Stable	Fast moving streams of medium to large size	Orange and green; grows to 4½ inches

Species Status Definitions:

Endangered: Species in imminent danger of extinction or extirpation throughout their range.

Threatened: Species that may become endangered within the forseeable future throughout their range.

Candidate: Species whose health is more secure than threatened, but still of concern.

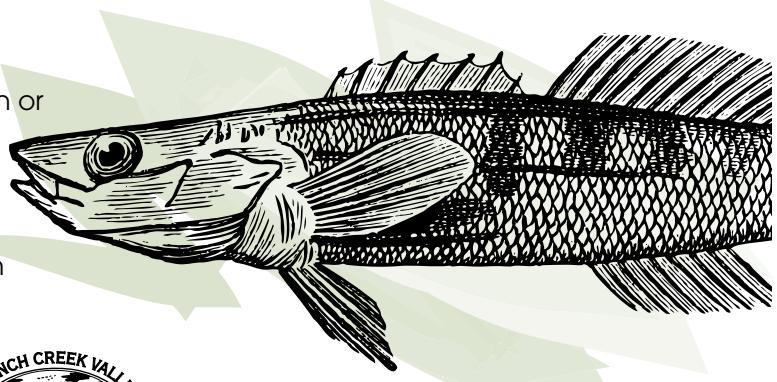

Photo courtesy of Dan Henninger

Threats to French Creek's Darters

Darters, along with many other species in French Creek are susceptible to pollution created by human activity. Sources of pollution include runoff from parking lots, roadways, and pesticides application, but water pollution does not always involve chemicals. In fact, because darters spend a great deal of their lifetime at the bottom of streams, one of the biggest threats to their habitat is siltation.

Siltation occurs when soil erodes from farm fields, construction sites, and streambanks within the watershed. Fine soil particles may eventually wash into tributaries and flow into French Creek, causing large amounts of silt which smothers eggs and gills, making it difficult for these fish to survive. Erosion and siltation can also lead to stagnation of water and low oxygen levels.

A League of Their Own

Until 1991, the species *E. pellucid* was considered a member of the genus *Ammocrypta*, meaning a "sand-dweller". After studying body shapes, biologists determined that this species along with the others in the genus actually belong with the *Etheostoma* genus. However, **sand darters**, with their many unique characteristics, are considered by some to represent a "subgenus" of their own.

Unlike other species within the genus, *E. pellucid* (which means "clear") has nearly transparent flesh and dark spots which remain the same color throughout the year. The body is elongated and almost cylindrical.

True to its name, the **eastern sand darter** makes sandy streambeds its home. Buried neck-deep in the sand, this species of darter ambushes its prey. In addition, the sand provides camouflage: when approached, this fish dives head first into the sand to bury itself and escape predation.

Because its habitat is rare and easily damaged by siltation, the **eastern sand darter** is only found in a few places in Pennsylvania—French Creek and the Presque Isle portion of Lake Erie. In fact, this species was thought to have disappeared from French Creek until Robert Criswell rediscovered it in 1991.

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Mayfly & Midge Larva: photo by Jason Neuswanger
Darter Illustration: Source: William & Robert Chambers Encyclopaedia - A Dictionary of Universal Knowledge for the People (Philadelphia: J. B. Lippincott & Co., 1881)
French Creek photo courtesy of Dan Henninger