



# Blackside Dace and Logging in Kentucky

By Mike Floyd and Jeff Stringer

Kentucky's rivers and streams support about 20 species of federally listed mussels and fish. One of these species, the blackside dace (*Phoxinus cumberlandensis*) - a small minnow that lives in southeastern Kentucky - is very vulnerable to impacts from poor logging, because it needs high-quality water and occurs in small, headwater streams where logging is common. To promote the conservation of this species in Kentucky and to prevent negative impacts from logging, the U.S. Fish and Wildlife Service (Kentucky Ecological Services Field Office in Frankfort) has prepared the following discussion that summarizes the species' biology and distribution, describes potential threats to its existence, and lists the logging BMPs required for its protection and recovery.

### What is a blackside dace?

The blackside dace is a small minnow, with a maximum length of about 3 inches that is restricted to headwater streams in southeastern Kentucky and north-eastern Tennessee. It has a pointed snout, an olive- or gold-colored back, a black stripe along its side, and sometimes has red or yellow markings around its mouth, gills, and fins. The U.S. Fish and Wildlife Service listed the blackside dace as a *threatened* species under the Endangered Species Act on June 12, 1987.



### What counties does the dace call home?

Blackside dace are restricted to the upper Cumberland River basin, primarily above Cumberland Falls. At present, they occupy streams in eight Kentucky counties:

- Bell
- Harlan
- Knox
- Laurel
- Letcher
- McCreary
- Pulaski
- Whitley



and three Tennessee counties (Campbell, Claiborne, and Scott).

*Photos courtesy of the authors unless otherwise noted.*



### What kind of stream does it live in?

Blackside dace inhabit cool, small, headwater streams with moderate flow. The species



is usually found in pools near undercut banks, large rocks, root mats, or other cover. The best populations of blackside occur in silt-free streams in heavily forested watersheds with stable stream banks and undisturbed riparian zones. The species requires silt-free gravel bottoms for spawning. In the absence of silt-free bottoms, the species often spawns (April to June) in nests of other fish species, such as creek chubs and stonerollers.

**Violations of the Endangered Species Act can carry a maximum penalty of \$25,000 and 6 months in jail for impacts to a threatened species, such as the blackside dace.**

### What do blackside dace eat?

Blackside dace eat algae, diatoms, and small invertebrates (insects).

### Why should loggers care and protect blackside dace?

*First*, sensitive species such as blackside dace serve as important indicators of overall stream health – as stream water quality and habitat conditions improve, dace num-

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bers tend to increase. Declines in their population tell us that we are damaging our soil, forest, and streams. Blackside dace are an important and unique species in headwater streams of the upper Cumberland River basin. They occur nowhere else on Earth. Their conservation should be encouraged, not dismissed or ignored.

**Second**, federal law (the Endangered Species Act [ESA] of 1973) requires protection of this and other threatened and endangered species. Violations of the ESA can carry a maximum penalty of \$100,000 and one year in jail for impacts to an endangered species and a maximum penalty of \$25,000 and six months in jail for impacts to a threatened species, such as the blackside dace.

**Finally**, Kentucky state law provides for the protection of streams (Outstanding State Resource Waters) that support federally endangered or threatened species including the blackside dace (401 KAR 5:030 and 401 KAR 5:031). Violations of water quality standards in these streams are handled by the Kentucky Division of Water, which maintains a list of these streams on their web site (<http://www.water.ky.gov/>). As soon as the list of Kentucky's blackside dace streams has been updated and available, we will include it in the next edition of the LogJam. The revised Timber Harvesting BMP Field Guide will also include information on the blackside dace.

### **Can logging harm blackside dace?**

Yes, if proper BMPs are not followed. Improper or poorly constructed stream crossings, poor road and skid trail construction and maintenance, poor water control, destruction of the streamside zone, and operation of equipment in the stream channel can cause excessive siltation

that directly harms blackside dace and destroys their living space (habitat). Improper crossings can also block the stream channel, preventing the natural upstream and downstream movement of blackside dace. These actions would likely cause violations of the ESA and state water quality standards for which the logger would be liable.

### **Can logging and blackside dace coexist?**

Absolutely. If proper BMPs are followed, potential impacts from sediment and habitat disturbance can be avoided or minimized. As opposed to other activities, such as coal mining, logging does little to affect water quality if conducted appropriately. If proper BMPs are implemented, impacts are negligible and short-term.

### **What are other threats to blackside dace?**

Coal mining, road construction, agriculture, and other activities cause siltation of streams and destruction of blackside dace habitat. Coal mining, in particular, often contributes metals and other dissolved solids that permanently affect water quality. If proper BMPs are implemented during these activities, potential impacts can be avoided or minimized. Excessive siltation destroys instream habitat, degrades water quality, and adversely impacts blackside dace and other aquatic species.

### **What BMPs are most important for protecting blackside dace?**

The U.S. Fish and Wildlife Service believes that Kentucky's timber harvesting BMPs (as found in *Field Guide to Best Management Practices for Timber Harvesting in Ken-*

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### **Logging pollution in stream near Barbourville containing blackside dace.**



**Above:** Landing to the left next to stream in SMZ and soil pushed into channel.



**Above:** Skid trail running downhill into flat next to stream. Notice flow of muddy water coming down skid trail from uphill seep. Water bar or other water control was needed to divert this flow before it gets to the bottom next to the stream.



**Right:** Muddy water due to skidding in stream above this point.

*Photos courtesy of L. Lowe, Kentucky Division of Forestry*

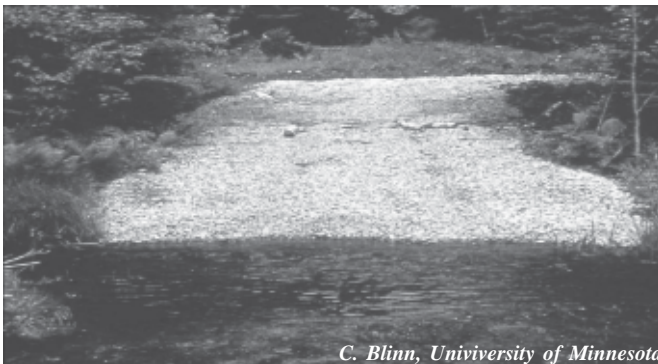


tucky, specifically BMPs 1, 2, 3, and 5, are very useful for protecting the blackside dace and its habitat.

However, to ensure that an Endangered Species Act violation does not occur, extra care is warranted. In some cases this means that measures above and beyond the minimum BMP requirements should be used. The main thing is still the main thing - keep soil and debris out of streams, don't traffic in streams with blackside dace, and limit stream crossings and make sure they are crossed correctly. The following are recommendations from the U.S. Fish and Wildlife Service.

**Recommendation 1. Limit crossings of intermittent and perennial streams to bridges or FORDS.** The BMP minimum requires that bridges and culverts should be used to cross streams and channels where feasible. However, for blackside dace culverts can be a problem, especially if they are not installed so that the fish can swim easily through the culvert. While this is not impossible to install culverts that allow for the three inch fish to move freely it is difficult in many situations. Because of this bridges are the best bet. If fords are used, limit their number and protect the approaches with rock or other material to stop erosion. Fords should always be on hard bottom.

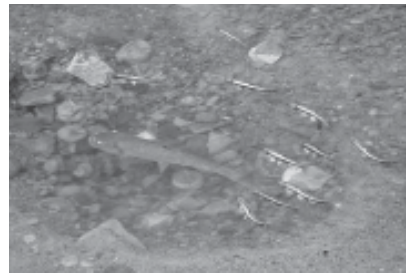
**Proper ford with gravelled approach and portable bridge in use below.**



*C. Blinn, University of Minnesota*



**Recommendation 2. Do not use stream channels as roads and do not operate equipment in the stream.** The BMP minimum requirement indicates that channels can be used if there is no other way to get to the property. This allows timber to be removed if



**Blackside dace swimming next to a creek chub nest.**

there is not other means of access. HOWEVER, when a threatened or endangered species, such as blackside dace, is in the stream, then killing or harming of them is prohibited even if this means that the timber can not be cut. The landowner needs to know that the stream contains blackside dace and that it is a violation of federal law to harm them.

**Recommendation 3. Keep yards and landings outside of Streamside Management Zones (SMZs) and do not push soil (sediment) or logging slash in the stream channel.**

**Recommendation 4. Revegetate roads, trails, landings, disturbed areas around crossings, and any other disturbed areas that could wash mud into the stream.** While BMP inspections are completed to see if seeding has been done, the blackside dace requires that little sediment enters the stream, this means that seeding in critical areas needs to be successful.

**Recommendation 5. Maintain 25-foot or 55 stream buffers with 50 percent of the over-story intact (for regular perennial streams) and ALL STREAM BANK TREES SHOULD BE LEFT.** While leaving all creek bank trees is not a BMP minimum requirement in Kentucky, in the case of blackside dace streams, the U.S. Fish and Wildlife Service strongly recommends that creek bank trees be left so that the banks are disturbed as little as possible.

**Recommendation 6. Do not block the stream channel with tree debris slash.** The BMP minimum requirement must be thoroughly adhered to. Also remove potential pollutants from equipment (oil, etc.) from the site and dispose of properly. Remove all garbage from the site and dispose of properly. 🗑️

*If you have questions about blackside dace or other listed species in Kentucky, please feel free to contact Dr. Michael Floyd, U.S. Fish and Wildlife Service's, Kentucky Ecological Services Field Office in Frankfort, (502) 695-0468 or [mike\\_floyd@fws.gov](mailto:mike_floyd@fws.gov).*



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University of Kentucky  
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**1. What type of stream does the blackside dace live in?**

- \_\_\_\_\_ streams or rivers like the Cumberland or Kentucky
- \_\_\_\_\_ intermittent sized streams with adequate flow in the winter
- \_\_\_\_\_ small headwater streams
- \_\_\_\_\_ small ponds in southeast Kentucky

**2. What is the average size of an adult blackside dace?**

- \_\_\_\_\_ 1 inch                      \_\_\_\_\_ about the size of an adult catfish
- \_\_\_\_\_ 3 inch                      \_\_\_\_\_ 5 inch

**3. The blackside dace is federally listed as:**

- \_\_\_\_\_ endangered                      \_\_\_\_\_ species at risk
- \_\_\_\_\_ protected                      \_\_\_\_\_ threatened

**4. Which county does the blackside dace not live in?**

- \_\_\_\_\_ Wayne                      \_\_\_\_\_ Pulaski
- \_\_\_\_\_ Harlan                      \_\_\_\_\_ McCreary

**5. What is the best description of conditions required for blackside dace spawning?**

- \_\_\_\_\_ sediment free, cool water with a soft bottom
- \_\_\_\_\_ cool water with logs and undercut banks
- \_\_\_\_\_ sediment free, cool water with hard rock bottom
- \_\_\_\_\_ sediment free water with a gravel bottom

**6. What species of fish does the blackside dace typically live with?**

- \_\_\_\_\_ trout and other cold water fish
- \_\_\_\_\_ smallmouth and spotted bass
- \_\_\_\_\_ stonerollers and creek chubs
- \_\_\_\_\_ snail darters

**7. What is the maximum penalty for harming the blackside dace?**

- \_\_\_\_\_ \$100,000 and 10 years in jail
- \_\_\_\_\_ \$100,000 and 1 year in jail
- \_\_\_\_\_ \$25,000 and 6 months in jail
- \_\_\_\_\_ \$10,000 and 1 year in jail

**8. What is the most common logging pollutant that affects the blackside dace?**

- \_\_\_\_\_ organic debris                      \_\_\_\_\_ nutrients
- \_\_\_\_\_ silt                      \_\_\_\_\_ trash

**9. Which logging activity is most likely to cause problems for blackside dace?**

- \_\_\_\_\_ skid trails and haul roads located on the contour
- \_\_\_\_\_ improved stream crossings
- \_\_\_\_\_ unimproved stream crossings
- \_\_\_\_\_ cutoffs left at landings

**10. What best describes the problem with culverts for use in blackside dace streams?**

- \_\_\_\_\_ galvanized pipe causes chemical problems in the water
- \_\_\_\_\_ transition from light to dark in the culvert makes it difficult for blackside dace to move into the pipe
- \_\_\_\_\_ muddy water easily flows down skid trails and into streams at culvert crossings
- \_\_\_\_\_ it is difficult to install culverts to ensure that the dace can easily swim into and through the pipe

**11. What practice involving SMZ's does the U.S Fish and Wildlife Service recommend?**

- \_\_\_\_\_ normal 50% overstory removal is adequate
- \_\_\_\_\_ 100% of overstory should be left
- \_\_\_\_\_ increase the width of the zone and leave all creek bank trees
- \_\_\_\_\_ normal overstory can be removed except creek bank trees should be left