

Brookies, Browns, Why Don't They Interbreed?

By Don Phares

When the white man arrived in West Virginia, he found a land blessed with cold, pure water where trout abounded. In spite of human activities since that time, many of these coldwater streams still support self-sustaining populations of brook, brown and rainbow trout. Often, these three species spawn in the same stream and occasionally even in the same pool.

Even though these trout have similar habitat and food requirements, nature prevents them from interbreeding to form hybrid populations by a variety of barriers that many observers might overlook. These barriers include spawning times, location of nests (called redds) within the stream, and physical characteristics.

Brook trout, the only trout species native to West Virginia, spawn during October before the other two species. As the spawning season approaches, brook trout tend to move upstream toward the headwaters. Since they occupy smaller streams than the brown or rainbow, the upstream movement further separates them from the other two

trout species. While this movement is instinctive, it is not necessary for successful reproduction. Streams with natural or manmade barriers that restrict upstream movement

In October, stream temperatures are cool and flows are generally low. Due to low flows, brook trout select spawning sites at the bottom of the pool just where the riffle for

the next downstream pool forms. This location insures sufficient water speed to prevent silt from settling on the eggs and to supply oxygen to the eggs.

Brook trout eggs remain buried in the stream gravel from October until they hatch in late February. Newly hatched trout, called "sac fry," continue to reside in the gravel for two to three weeks as they absorb nutrients in their

yolk sac. As they grow stronger, the fry emerge from relatively safe gravel redds to face a much more hostile March stream environment. Within the first few days of leaving the nest, 90 to 95 percent of the small trout may be lost to predators and to high, cold stream flows. The brookies that survive may live as long as four years.

Brown trout are the next to spawn. This species, originally imported from Europe, spawns during November. Although browns tend to move upstream, it is not as strong a movement as that exhibited by brook trout. Again, the up-



Steve Brown

A brook trout, caught in fall, displays its brilliant spawning coloration.

can still support reproducing brook trout populations.

Both male and female brookies are sexually mature at the end of their second year when they are four to six inches in length. Male brook trout begin changing color and body form in August. Their normal red coloration becomes more intense. Body form becomes slimmer and the lower jaw develops a distinct hooked appearance. The normally beautiful male brook trout becomes spectacular. Although the female develops a heavier body as the eggs mature, body coloration remains basically unchanged.

Rainbows

stream movement is not necessary for successful reproduction in most streams. Since brown trout often live in the larger downstream areas, the movement carries them into the middle section of streams.

Male brown trout become sexually mature at age two while female browns generally do not produce eggs until their third year. Males develop a slimmer body form with somewhat brighter coloration during

spawning.

This transformation is not as dramatic as for the male brook trout. Male browns develop a very pronounced hooked jaw, particularly after they reach four to

five years of age. As with the female brook trout, the female brown becomes

slightly heavier bodied, but coloration remains unchanged.

During November, water temperatures approach freezing and

flows are generally high. Due to these harsh conditions, browns tend to select redd sites somewhat farther up in the pool than brook trout. With high stream flows, ample

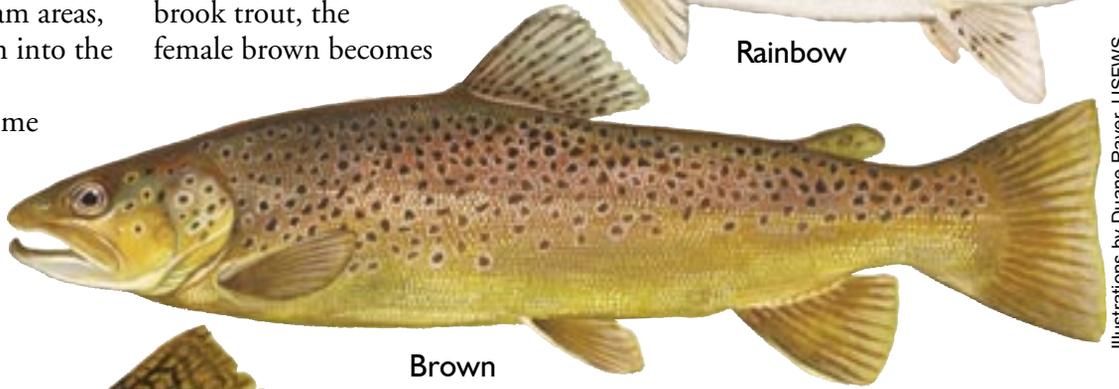
oxygen is available and the water velocity keeps the redds silt free. Since the eggs are spawned later than those of the brook trout, they hatch several days later than brook trout eggs. Early March finds the brown trout eggs hatching. The fry leave the nest in late March or early April. When the browns do leave the nest, they face many perils, and mortality rates are about the same as for brook trout. Brown trout may survive for up to eight years in the wild.

About the time brook trout eggs begin to hatch in February, the wild rainbows spawn in high, icy flows. Originally from the western United States, rainbows have the strongest tendency to migrate upstream prior to spawning. Most wild rainbow populations are located in medium-

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Rainbow



Brown



Brook

Illustrations by Duane Raver, USFWS



Steve Brown

While brown trout usually hang out in stream pools, they usually feed in the shallow sections.



Steve Brown

A hardy angler wets his line during mid-winter when rainbow trout spawn.

sized streams, and their upstream migration often carries them into native brook trout waters.

As in the case of brown trout, wild rainbow males become sexually mature during their second year while most females do not mature until the third year. The already brightly colored males become even brighter. In addition, they develop bright red gill covers and a stripe along their sides. Slightly hooked jaws develop in older males. Females tend to increase in color intensity slightly and their body form becomes heavier.

Rainbows spawn under the worst stream conditions, which include freezing water and high flows. They select redd sites near the middle of the pool. High, cold flows

insure abundant oxygen for the eggs and sufficient velocity to keep the redd silt free. Since the eggs are spawned last, they are the last of the three trout species to hatch. They begin hatching in late March and the fry emerge in mid-April. Although stream conditions are not as bad as when brook and brown trout emerge, fish and insect predators are more active so fry losses are severe. Rainbows can be expected to survive for five to six years under natural stream conditions.

Having more than one trout species in a stream is generally beneficial. A fishery made up of several trout species contains more fish than a single species population. This is possible because various trout species have slightly different

diets and live in different locations within both the stream and the same pool. By making use of these different living conditions and creating their own niches, more trout can live in a single stream.

Without a barrier to prevent hybridization, the different trout species over time would most likely become one hybrid population with the same habitat requirements. This would mean that the trout would not use all the available niches and the population would decline. The barriers that prevent hybridization between brook, brown and rainbow trout are as effective as if the trout were in different streams.

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