

Wild Trout Are Travelers

By Ken Undercoffer

Until recently, most fisheries biologists believed that wild trout were basically homebodies. The management of trout in Pennsylvania, and most other states as well, is based on the paradigm that stream-dwelling trout seldom move more than a few hundred feet from where they were born. Pennsylvania's stream classification system and fishing regulations are based on the premise that trout stay put.

Wild trout studies are typically conducted by electro-shocking short, sample-sections of streams in mid-summer when water levels are low. Trout numbers, species, age, and size are estimated using the data collected. Regulations are then promulgated based on the findings. Streams are partitioned and sections set aside in order to satisfy the desires of various segments of the angling public, political and economic pressures and, occasionally, to further the biological needs of trout. In a few of our more productive wild trout streams, special project waters are established in order to enhance the quality of the fishing. Most of these sections are short and waters above and below are usually managed under general regulations and are often stocked. Angling opportunities in special project waters are enhanced by the use of reduced creel and increased minimum size limits and, frequently, tackle restrictions based on the presumption that the resident trout population does not move out of the specially managed waters. Is this a valid assumption?



Photo: Chaz Macdonald

In 1885, Nesmuk wrote in "Catching Them on the June Rise" how every year brookies moved upstream in immense numbers after early summer rains had swollen streams. He caught 64 brookies weighing more than 13 pounds in aggregate the day he met them on 'the June rise' often taking two-at-a-time on his two-fly rig. In "The Vanishing Trout" Charles Lose tells us that brook trout moved out of the main stem of the Loyalsock into tributaries and headwaters as water temperatures rose in the early summer. They remained in these smaller and cooler upstream waters until fall.

Then, after spawning, when November rains again raised water levels, they dropped back down into big holes of the now-cool main stem to winter over and utilize the expanded forage base of the larger waters. This cycle had been repeated year after year for thousands of years and enabled brook trout to utilize the rich feeding grounds of main stem waters to fatten up in the spring and cool tributaries and headwaters to escape the summer heat. Seasonal movements were common in our large freestone and limestone streams and were well known to early anglers. In those days brook trout reached sizes we can

scarcely imagine today, sometimes reaching lengths in excess of 20 inches and weights approaching 4 pounds.

Apparently, brown trout made similar journeys after they were introduced. Movements of brown trout in the upper Allegheny were documented in a study conducted early in the 20th century using tagged fish. Some were found to have traveled as much as 22 miles. Every year, about the middle of June, big browns gathered in the Goodsell Hole at the junction of the Allegheny River and Mill Creek in Coudersport, before continuing their journey upstream in search of cooler water. Fishermen willing to forgo a night's sleep would slip down to the Goodsell Hole after dark and regularly take browns up to 24 inches in those glory days. Now this section has been channelized into a massive drainage ditch and this once magnificent place is only a memory.

So, how was all of this forgotten? The misconception that stream-dwelling trout are basically sedentary derived from the way studies of trout movements have been conducted in the past. Typically, trout were captured using electro-shocking or weirs, then tagged or fin-clipped and released. After a period of time, usually just a few weeks, the process was repeated and the number of marked trout recaptured and the distance traveled recorded. The sample reach during these studies was usually quite short long-range movements were assumed to be unlikely so most recaptures were fish that had only moved short distances. But more importantly, a lot of the marked fish, often more than half, were never recaptured. Where had they gone? The mortality rate due to natural causes in streams is often quite high and it was assumed that they had simply succumbed to predators or some other natural peril. But maybe they hadn't perished at all: maybe they just moved on to some other place that offered them a better chance for survival! This possibility was rarely considered.

Recent biological studies show that this is exactly what was happening. In one, fish biologists Charles Gowan and Kurt Fausch conducted studies of wild brook trout in Colorado [Mobile Brook Trout in Two High-Elevation Colorado Streams: Re-evaluating the Concept of Restricted Movement, Canadian Journal of Fisheries Aquatic Science, 1996]. They marked and recaptured brook trout using weirs and electro-fishing at locations up to 2.8 miles apart. Movements of more than a quarter-mile were common; the maximum distance traveled was a little over two miles. Highest rates of movement occurred during and just after spring runoff, but substantial numbers of trout were moving throughout the summer. So it appears the "old-timers" were right: trout do indeed move widely.



Photo by Todd Burns

New studies, and even some older studies that have been either forgotten or ignored, show that trout move from a few hundred yards to many miles during their lifetime. Trout move to find places with

more suitable water levels and temperatures and to expand their forage base. According to Gowan and Fausch, moving trout are often thinner than the general population and tend to be somewhat longer on average. These are fish that have outgrown their food supply and must move in order to find more profitable stream positions, for once trout quit growing they soon lose weight and die. Movements appear to be most common in freestone streams where extremes in flow and temperature are typical and stream fertility is low. And this behavior is extremely plastic: Some trout move infrequently and then only for short distances, whereas others move often and for miles. After they have moved, some fish find a suitable place, settle in, and remain for a long time. Others, after staying in one place for a while, apparently find conditions are no longer favorable and become mobile. The life of a wild trout is anything but sedentary.

Trout do not move for frivolous reasons. These movements are necessary in order for them to meet their biological needs. If they cannot move, their size and numbers will be limited by the habitat into which they have been confined.

Large downstream reaches with deep pools provide refuge from anchor ice and ice floods in the winter and large numbers of mayflies, caddis and, more importantly, minnows and crayfish on which to feed and grow large. These rich feeding grounds may have to be abandoned in mid-summer whenever water levels fall and temperatures peak, so an extensive network of cold upstream sections is needed in order to provide refuge from the summer heat. Come fall, these upstream reaches also provide clean, clear water and gravel for spawning. If all of the biological needs of trout cannot be met in a single place, they will move in order to meet these needs and maximize their chances for growth and survival. Trout do whatever they must in order to survive.

The implications are obvious: Setting aside short sections of streams for special protection and carefully controlling the harvest in these sections is futile if the fish regularly move out of these areas into unprotected waters. Wild trout need whole watersheds in order to thrive and grow large. A piece here and there is not enough.