Fisheries Research Fact Sheet

Persistence and Movement of Stocked Trout in North Carolina Streams

September 2016

Rainbow Trout *(Photo: Jennifer Rowe)*

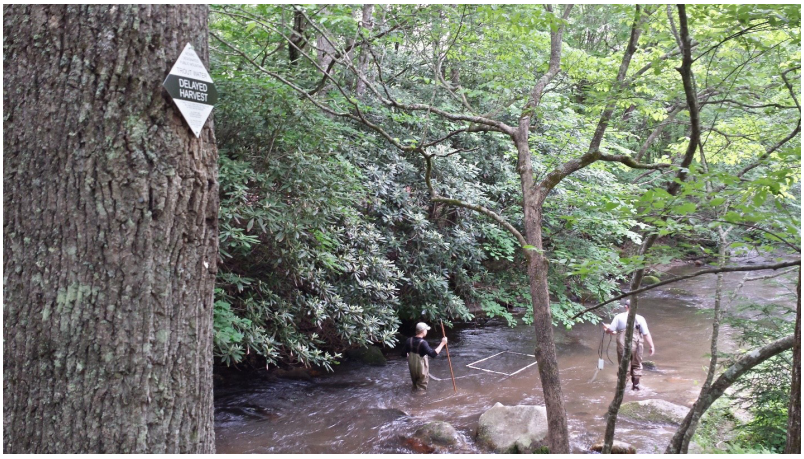
The N.C. Wildlife Resources Commission (Commission) manages approximately 5,400 miles of streams and rivers within its Public Mountain Trout Waters program. Almost 1,000 miles of these resources are classified as Delayed Harvest or Hatchery Supported waters, which are popular fisheries that depend on intensive, seasonal stockings of trout. However, anglers and managers often perceive that catch rates decline through time following stocking events. This trend is expected in Hatchery Supported waters, where immediate harvest is allowed (first Saturday in April–last day of February); however, declining catch rates are also observed in Delayed Harvest waters during the period when harvest is not permitted (October–first Saturday in June). As a result, the Commission partnered with researchers at North Carolina State University to further understand what happens to trout after stockings in Delayed Harvest waters.

Objective

Provide information regarding the persistence of stocked trout in Delayed Harvest waters to guide management of stocked-trout fisheries.

Methods

Hatchery trout were tagged with a combination of passive integrated transponders (known as PIT tags) and radio transmitters (radio tags), stocked into the Delayed Harvest waters of North Toe River (Mitchell County), East Prong Roaring River (Wilkes County), and Little River (Alleghany County), and monitored during the catch-and-release season from October 2012 to June 2014.



N.C. State University researchers scanning for PIT-tagged trout via a floating antenna (Fixed-antenna arrays were stationed at upper and lower ends of each study reach.) *(Photos: Jacob Rash)*

Brook Trout

Rainbow Trout

Brown Trout

Trout illustrations: Duane Raver

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Results

- 19–65% of trout emigrated (i.e., left) from the study reaches, while 1–29% died there
- Most radio-tagged fish (71% overall; 59–85% by river) stayed within 1 mile of the stocking location, whereas 6% migrated ≥ 6 miles from the stocking location
- Few trout stocked during fall (October and November) were available to anglers in June
- Emigration from Delayed Harvest reaches was typically associated with stocking and high-flow events
- We also found that a vast majority of migrating fish do so in a downstream direction
- Patterns in emigration and mortality suggested that emigration caused a greater loss of trout than mortality in all rivers; no river-size pattern was apparent in emigration, but mortality was greater in small streams
- Brook Trout migration and mortality rates were highest among the three species, and large fish (≥ 14 inches) showed higher emigration and mortality rates than catchable-sized trout (≥ 10 inches)

Brook Trout (top) and Rainbow Trout (bottom) with radio tag antennas visible *(Photos: Jacob Rash)*

In Summary

- Reduced numbers of trout (and corresponding catch rates) in Delayed Harvest waters post stocking are most likely due to fish movement, which was found to be associated with high-flow and stocking events during this study.

For more information, contact:

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References:

Fischer, J.R., T.J. Kwak, H.J. Flowers, W.G. Cope, J.M. Rash, and D.A. Besler. 2019. Growth, condition, and trophic relations of stocked trout in southern Appalachian Mountain streams. Transactions of the American Fisheries Society 148: 771–784.

Flowers, H.J., T.J. Kwak, J.R. Fischer, W.G. Cope, J.M. Rash, and D.A Besler. 2019. Behavior and survival of stocked trout in southern Appalachian Mountain streams. Transactions of the American Fisheries Society 148: 3–20.

Brown Trout (top) and Rainbow Trout (bottom)
(Photos:Jennifer Rowe)