



Suitability of Stocked Brown Trout and Rainbow Trout for Trophy Management in Apalachia Reservoir

November 2018

The N.C. Wildlife Resources Commission (NCWRC) conducted experimental trout stockings from 2012–2016 in Apalachia Reservoir to determine the best size and species of trout to create a trophy trout fishery. Apalachia Reservoir is an 1,100-acre impoundment in Cherokee County that contains trout habitat year-round due to the cold, oxygenated water discharged from Hiwassee Dam. Blueback Herring, a nonnative shad introduced illegally into the Hiwassee River watershed that has caused unwanted impacts to mountain fisheries, are abundant in Apalachia Reservoir and provide forage for stocked trout. These conditions are favorable for establishing a trout fishery, and they even have the possibility of producing trophy trout. Such a fishery on Apalachia Reservoir would increase the diversity and abundance of trout fishing opportunities in western North Carolina.

Project Objectives:

- Determine the optimal size and species of trout to stock in Apalachia Reservoir to create a trophy-trout (≥ 20 inches) fishery.

Methods:

- Brown Trout and Rainbow Trout were reared to two target sizes: 10 inches (small) and 14 inches (large).
- All trout were stocked in December 2012–2015.
- Survival, growth, diet and condition of trout were assessed through annual fall gill-net and spring electrofishing collections.
- An angler creel survey was conducted from Dec. 1, 2014 through Nov. 30, 2015 to determine the return of stocked trout to the angler creel.



Apalachia Reservoir is located in Cherokee County



District 9 Fisheries Biologist 1 Amanda Bushon holds a trophy-sized brown trout from Apalachia Reservoir (Photo: NCWRC)



District 9 Fisheries Biologist Powell Wheeler holds two trophy-sized brown trout from Apalachia Reservoir (Photo: NCWRC)



Results:

- Small Rainbow Trout grew at a faster rate, but Brown Trout, both large and small, reached larger sizes (≥ 20 inches).
- Rainbow Trout exhibited poor survival and were not collected in gill-nets, electrofishing or angler creel samples beyond 16 months after stocking. Brown Trout were collected up to 33 months after stocking.
- Large Brown Trout fed primarily on fish within the first four months after stocking, whereas the small Brown Trout and both sizes of Rainbow Trout fed primarily on aquatic insects. Small Brown Trout converted to a fish diet by 16 months after stocking.
- Due to their piscivorous diet, Brown Trout added weight at a faster rate than rainbow trout.
- Relative weight values (a metric to measure condition via length-weight comparisons, with values ≥ 80 indicating “plumper” fish) for Brown Trout were typically higher than Rainbow Trout throughout the study. Large Brown Trout mean relative weight ranged from 71–137, whereas small Brown Trout ranged from 84–125. Large and small Rainbow Trout condition ranged from 63–109 and 66–95, respectively (Figure 2).
- During the angler creel survey, Brown Trout were caught and harvested more frequently than Rainbow Trout; approximately 60% of all trout caught and 76% of all trout harvested were Brown Trout. Length frequencies of harvested trout measured by the creel clerk (N = 122) revealed that the largest trout harvested were Brown Trout (Figure 2).
- Brown Trout, large and small, were more popular with anglers, persisted longer in the reservoir and reached larger sizes than Rainbow Trout.

What’s next?:

- Discontinue Rainbow Trout stockings.
- Continue stocking large Brown Trout and increase the number of small Brown Trout to compensate for the loss of Rainbow Trout to the angler creel.
- Designate Apalachia Reservoir as Public Mountain Trout Waters and classify as Special Regulation Trout Waters: three-fish daily creel limit, with only one fish greater than 14 inches.
- Fisheries biologists will monitor for population changes following the new regulation beginning in 2021.

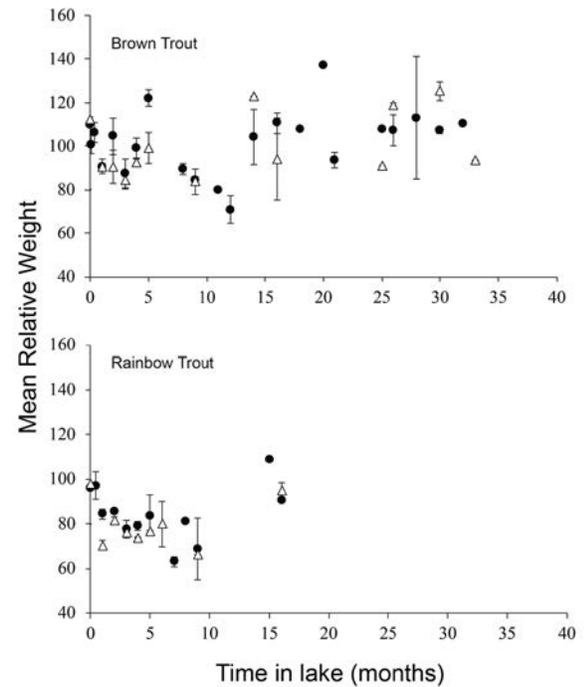


FIGURE 1.—Mean relative weight at time in the lake (months) for Brown Trout and Rainbow Trout in Apalachia Reservoir. Black circles represent the large size class and white triangles represent the small size class. Mean relative weight values above 80 (represented by the dashed line) indicate “plumper” fish. Error bars represent standard error.

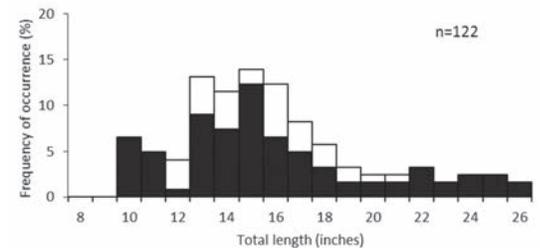


FIGURE 2.—Length frequencies of Brown Trout (shaded bars) and Rainbow Trout (unshaded bars) harvested from Apalachia Reservoir, NC, during the angler creel survey Dec. 1, 2014 through Nov. 30, 2015.

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