

Young-of-year trout sampling on Esopus Creek (Survey #323024)

Robert D. Adams, Region 3 Fisheries

September 2023

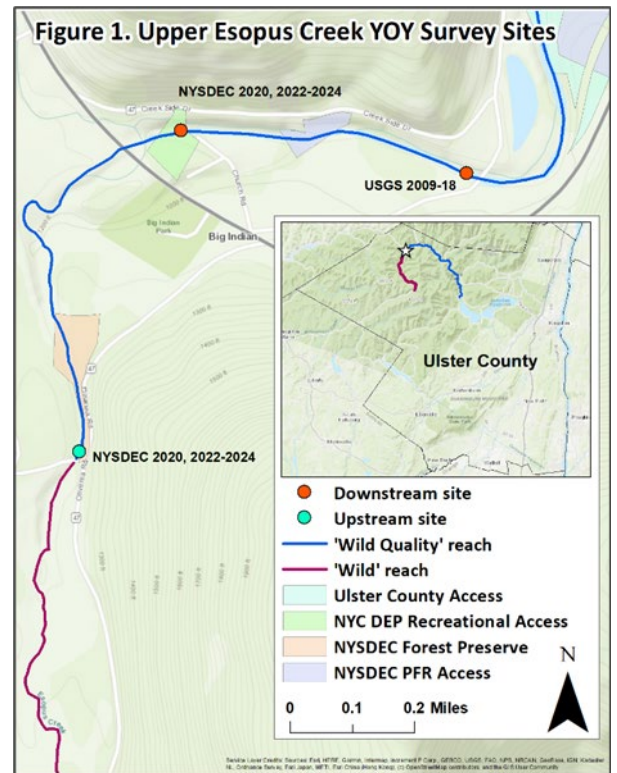
Despite extensive outreach for the New York State Inland Trout Stream Management Plan (NYSDEC 2020), public concerns regarding the catch-and-release season on trout spawning success remained. As a result, the Bureau devised a four-year, statewide survey to compare angler use with young-of-year (YOY) recruitment (NYSDEC 2021). This report covers sampling on the Upper Esopus Creek, one of six reaches in NYSDCE’s Region 3 chosen for the statewide survey.

Prior to 2021, Upper Esopus anglers targeted wild rainbow, wild brown and stocked brown trout from April 1st to November 30. In 2021, based on changes to the Inland Trout Stream Management Plan (NYSDEC 2020), the creek’s harvest season was changed (Apr 1 – Oct 15), a catch-and-release season was added (Oct 16-Mar 31) and the management regime became ‘Wild-Quality’, ending the NYSDCE’s century-old brown trout stocking policy for the creek. As a result, the fishery has shifted toward wild, resident trout, with an added opportunity to catch (and release) lake-run brown and rainbow trout migrating into the Upper Esopus from the Ashokan Reservoir during their respective spawning seasons.

The current ‘Wild Quality’ reach spans 18 miles from Chimney Hole in Boiceville, NY upstream to Lost Clove Creek in Big Indian, NY (see Figure 1 inset). The Shandaken Tunnel Outlet (Portal), a NYC drinking water aqueduct outflow, splits this reach into very different sections. Stream habitats below the Portal are heavily influenced by the releases, which can add up to 600 million gallons a day of mostly cold water to the creek. Upstream of the Portal, the creek is a more traditional Catskill trout stream with moderate widths, ample shading, undercut banks, and a mixture of silty and rocky substrates. The YOY survey focuses on the ‘Wild Quality’ reach above the Portal.

Prior to the current survey, the most recent NYSDCE trout population surveys above the Portal took place in 1990, 1994, 2010-2013 and 2020; however, these surveys mainly targeted adult trout, especially survey years 2011-2013 which focused on holdover, stocked brown trout. In addition to the NYSDCE surveys in this reach, the USGS Watershed Research Section collected population level fish data each July from 2009 to 2018 as part of a long-term Catskill Mountain stream survey (Baldigo and George 2019). USGS sampling consisted of multi-pass depletions using backpack shockers and blocking seines at three 100m sub-reaches near the Firehouse Road Bridge (Big Indian, NY). The entire channel width was sampled at two of the three sub-reaches, while only half of the channel was blocked and sampled at the third site. The USGS survey targeted all fish species and age classes.

Due to the ease of access and close proximity to the USGS survey location at Firehouse Road, the two most upstream sites from the 2020 NYSDCE Survey were selected for the YOY Recruitment Study (Figure 1). The first site is on NYCDEP property at the end of Church Road, roughly 0.5 miles upstream from the USGS site. The second site is located immediately downstream of Lost Clove Road bridge, 0.75 miles upstream of the first site. A large tributary (Birch Creek) enters the Esopus between the two YOY sampling sites, resulting in different flow conditions, and potentially trout populations, between sites. Though slated to be sampled in Fall 2021, high flows led to unsafe conditions and sampling was cancelled. On September



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21, 2022, both sites were sampled using a two-pass depletion with no blocking seines per survey protocols (NYSDEC 2021). Flow conditions also impacted the 2023 survey, with discharges at the DEP Church Street site too high for safe sampling. Fortunately, conditions allowed for the Lost Clove Road site to be sampled in a three-pass depletion on September 22, 2023.

The 2009-2018 USGS and 2020-23 NYSDEC datasets provide the best timeseries to evaluate current trout recruitment. The observed YOY per acre from these surveys are compared in Figure 2. Observed values are used, rather than those derived from population estimates, due to differing sampling methodologies between the agencies. As winter/early spring flows may influence YOY recruitment and biomass in the Esopus watershed (Warren et al 2009), the high discharge events measured at Allaben during the spawn season (Nov-Mar) and months of larval emergence (Apr-May) at the USGS Gage at Allaben are also shown in Figure 2. Note the year of discharge values have been lagged to represent the time periods where YOY sampled were produced. For example, spawn event values for 2022 include discharges from November and December of 2021. For this analysis, we defined flood events as values over 1600 CFS, the 99th percentile value for the timeseries (2009-2023).

As shown in Figure 2, the years with the four highest YOY biomass values saw minimal flood events from the spawn season through larval emergence. Excluding 2012-2013, years where habitat was still recovering from the massive flooding resulting from Tropical Storms Irene and Lee, the four lowest YOY biomass values came during years where there were at least two flood events during April-May. Whether these floods pushed eggs or larvae out of the reach or were detrimental to survival, they appear to influence YOY presence at these sampling sites. The young-of-year recruitment survey will conclude in 2024 and a larger report will follow.

Literature Cited

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