

Delaware River

Monroe and Northampton Counties

American Shad spring spawning monitoring, 2014

Management of American Shad is a joint effort by Delaware River Basin Fish and Wildlife Management Cooperative (Co-op) member agencies, under the direction of the Atlantic States Marine Fisheries Commission (ASMFC). The Pennsylvania Fish and Boat Commission (PFBC) is a member of both groups. In February 2012, the ASMFC accepted the Co-op's American Shad Sustainability Plan ([SFP](#)). Population benchmarks and management actions are detailed in the [SFP](#) for the sustainability of the Delaware River American Shad population. The PFBC completed monitoring for American Shad at our two long-term sites, Raubsville (RM 178.9) and Smithfield Beach (RM 218) for the 2014 spawning run. This monitoring effort is in support of management benchmarks identified in the Co-op SFP.

Weekly boat electrofishing at Raubsville provides an index of relative abundance of the returning adult American Shad run. For the 2014 shad run, sampling started on March 27 and ended on May 7, during which the river was electrofished one day per week. A total of 129 shad (58 females, 71 males) were collected. Mean total lengths (TL) were 21.3 inches for females and 19.1 inches for males. Shad sizes ranged from 16.8 to 24.2 TL for females, and 16.1 to 21.9 inches for males. The spawning state of all females (N = 53) collected was gravid, suggesting they were not yet ready for spawning. An overall average catch-per-unit-effort (CPUE) was 27.2 shad/hour. Comparatively, the 2014 relative abundance CPUE ranked fifth highest in the entire time-series (Figure 1). The 2014, spawning run CPUE was relatively smaller compared to the previous two years, declining from the peak observed in 2012.

The Smithfield Beach monitoring employs gill net sampling gear, and is represented by a long-term (25 years; 1990-2014) American shad sampling effort, that also facilitates egg collection by the PFBC for use in restoration and enhancement programs. This program principally provides field fertilized eggs for use in hatchery culture and restoration efforts on the Lehigh and Schuylkill Rivers. Observed catch rates, however, also provide biologists with insight into the relative abundance of American Shad and trends in the annual spawning runs.

Specifically, spawning shad are collected via gillnets of various stretch mesh sizes ranging from 4.5 - 6.0 inches, deployed from dusk till approximately midnight. Thirteen netting days occurred on the Delaware River at Smithfield Beach from May 11 through May 29, 2014. A total of 755 adult American shad (593 females, 162 males) were caught at Smithfield Beach for an overall mean CPUE of 3.6 shad/gill net; 49.39 shad/net-ft-hr*10,000. This is the 12th highest CPUE value since 1990 (Figure 2). Nightly catches ranged from a low of zero to a high of 122 shad. Mean total lengths of female shad were 21.1 inches TL (sizes ranged 17.8 to 24.3 inches TL) and 19.4 inches TL (sizes ranged 16.9 to 21.9 inches TL) for males. Estimation of age distributions via scale and otolith (ear bone) are not yet compiled. The size distribution of the both sexes, however, suggests that the age structure likely has not appreciably changed from previous years observations.

Under the Co-op American Shad SFP, a benchmark was developed based on Smithfield Beach data from 1990-2011 (Figure 2). The benchmark was defined as an annual mean of 34.79

shad/net-ft-hr*10,000 (i.e., the 25th percentile where 75% of values are higher). Three consecutive years with values lower than the benchmark will generate appropriate management action. The 2014 Smithfield Beach CPUE was above the benchmark, categorizing the 2014 spawning run as sustainable.

Figure 1. Annual catch-per-unit-effort for American shad in the Raubsville electro-fishing surveys, 1997-2001, 2010-2014

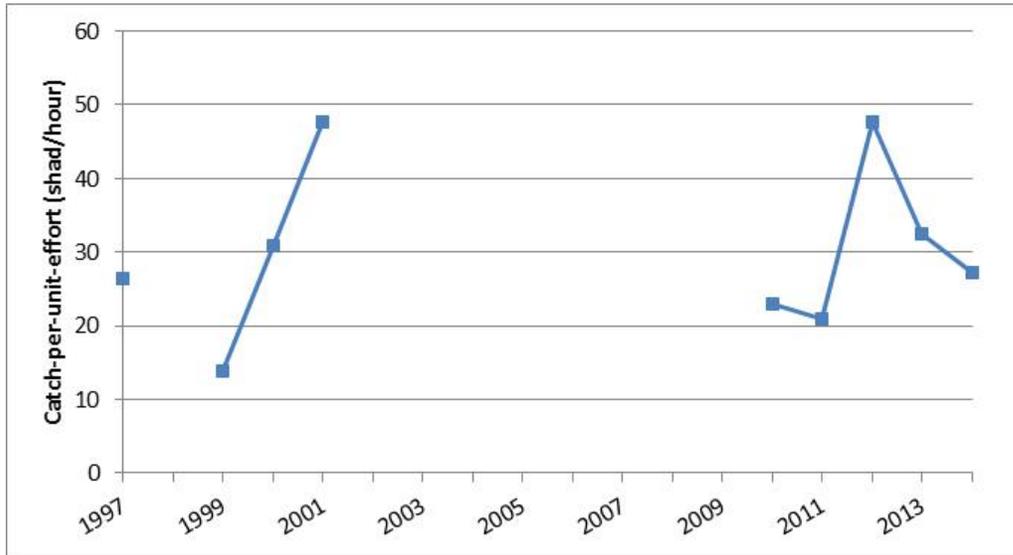
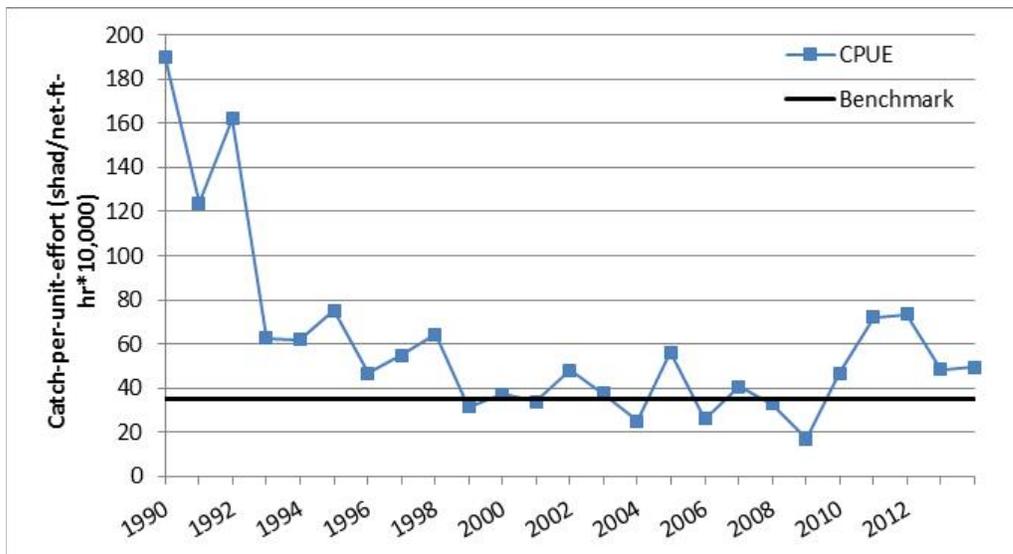


Figure 2. Annual catch-per-unit-effort for American shad in the Smithfield Beach egg-take operation at Smithfield Beach, 1990 - 2014.



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