

## **Results of the 2015 nontidal Potomac River watershed Smallmouth Bass Young of Year Survey**

Natural reproduction of smallmouth bass in the nontidal Potomac River mainstem has been assessed annually since 1975. Presently, a 30' seine is used to collect young of year bass (Figure 1), as well as nongame species, from 10 sites (84 hauls) on the mainstem and from 4 sites on the North Branch (12 hauls) during the month of July. Additionally, 7 sites (21 hauls) on the Monocacy River and 5 sites (15 hauls) on Conococheague Creek are also completed annually. Juvenile smallmouth bass are generally 1 to 3" in length by mid-summer (Figure 2). The geometric mean number of young bass collected per haul is used as an index of yearclass strength. This index is useful to evaluate individual year-class strength, compare years, and establish trends. The strength or weakness of yearclasses will influence the abundance and size distribution of the adult population in the following years.

Reproduction of smallmouth bass in the Maryland portion of the Potomac watershed in 2015 ranged from fair to excellent. The lowest reproduction was recorded from the Monocacy River with a seining index of 1.7 young bass per seine haul, below the long term median value (middle value in a series arranged from smallest to largest) of 1.9. There has been no significant trend in smallmouth bass yearclass strength since the seining survey was initiated on the Monocacy in 1997.

Smallmouth bass reproduction on the Potomac mainstem (PawPaw, WV downstream to Seneca) was considered to be "good" with a mean of 1.9 young bass per haul, above the median value of 1.6 (Figure 4). The hatch was slightly stronger in the middle and lower reaches than the western stretches upstream of Dam 5. A good hatch was particularly important in the middle Potomac (Dam 5 downstream to Dam 3) where the seining index has generally fallen below the median value since 2008 (Figure 5). In the middle river the median value for the period 1975 – 2007 was 2.3 and has fallen to 1.4 from 2008 to the present. The 2015 seining index of 2.0 young bass per seine haul in the middle river was the highest since 2007.

In the lower river (Harpers Ferry, WV downstream to Seneca) the hatch of largemouth bass was considered to be very high with a seining index of 1.9, nearly as high as the smallmouth index of 2.0. The lower gradient and extensive aquatic vegetation at Whites Ferry, Edwards Ferry, and Seneca provide good habitat for largemouth bass.

This habitat is also favorable for northern snakehead, which have recently been confirmed upstream of Great Falls. The expansion of northern snakehead into the upper Potomac watershed will most likely have negative impacts to existing fish populations through predation and competition. The Maryland DNR is working with the U.S. Fish and Wildlife Service (USFWS) to monitor the spread and ecological impacts of this

recent introduction. Fishermen are encouraged to kill and consume any snakeheads they encounter and to report the capture of snakeheads to [fishingreports.dnr@maryland.gov](mailto:fishingreports.dnr@maryland.gov).

A strong yearclass of smallmouth bass was documented in Conococheague Creek following a very poor yearclass in 2014. With a seining index of 3.5, the 2015 yearclass was the strongest hatch since 2010 (seining index 7) and well above the median value of 2.3. Conococheague Creek smallmouth bass generally produce very strong yearclasses when spring river conditions are favorable.

Sadly, several of the young bass collected from Conococheague Creek showed signs of a myxozoan parasite infection revealed by small white cysts on the back and near the tail. Although this parasite may not cause severe disease, it results in a break in the epithelium (skin) that allows secondary bacterial infections to take hold that can increase mortality. The myxozoa was identified by scientists at the USGS Leetown Fish Health Laboratory as the same species that has been contributing to the mortality of young smallmouth bass in the Susquehanna River. Though well intentioned, moving fish from one body of water to another is illegal and can result in the spread of disease, parasites, and detrimental introductions of invasive species.

Environmental factors such as flow have the greatest influence on yearclass strength. Smallmouth bass spawn in backwater environments protected from the main river flow. High flows and turbidity limit the amount of ideal spawning and rearing habitat forcing bass to construct nests in less than ideal locations, which can reduce the number of eggs or fry that survive. Additionally, heavy river flow can cause adult bass to abandon the nest and displace bass eggs or fry increasing mortality and predation. High flows during June can increase juvenile mortality by reducing suitable habitat and feeding efficiency. During 2015, low stable flows during May and most of June provided good spawning conditions, but heavy early summer flows may have increased juvenile mortality. Though highly variable from one year to the next, the average flow during May when smallmouth are spawning has shown a long-term increasing trend. Higher average flows during the spawning season may reduce the frequency of strong yearclasses. Other factors such as intersex, disease, parasites, food availability, and competition are also factors that influence and can reduce yearclass strength.

Yearclass strength for river smallmouth bass populations is highly variable. This variation in recruitment can result in significant fluctuations in angler catch rates four or more years later as well as alter the percentage of quality size fish in the population. For example, poor reproduction throughout the Potomac watershed in 2013 and 2014 will result in fewer 7 – 10” smallmouth available in 2016 whereas stronger reproduction during 2011 and 2012 should result in more 12 – 15” smallmouth. Smallmouth in the lower stretches will be slightly larger; bass from the upper stretches will be slightly smaller due to differences in growth rates.

For more information or questions regarding the management of smallmouth bass in the nontidal Potomac River, please contact John Mullican at [john.mullican@maryland.gov](mailto:john.mullican@maryland.gov) or 301-898-5443.



Figure 1. Conducting the nontidal Potomac River watershed summer seining survey for young-of-year smallmouth bass.



Figure 2 & 3. Young smallmouth bass collected during the annual Potomac River watershed seining survey.

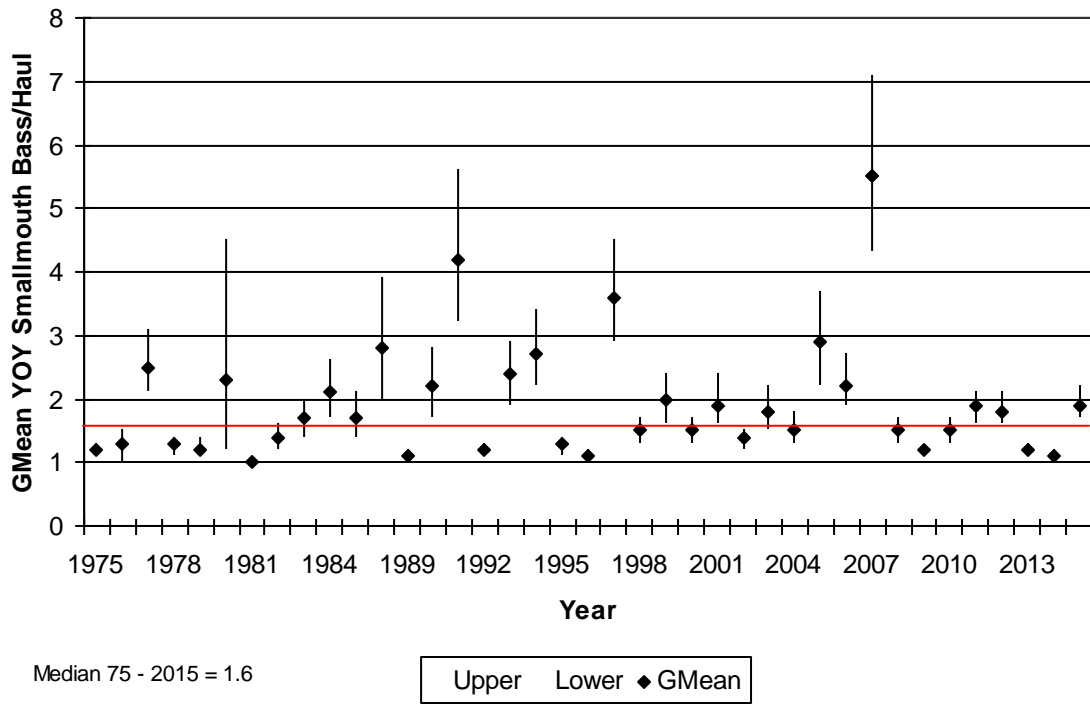


Figure 4. Overall annual geometric mean number of young smallmouth bass per seine haul captured from the **mainstem** Potomac River (PawPaw, WV to Seneca, MD) 1975 - 2015. 95% confidence interval. Red line equals long term median value of 1.6 young smallmouth per haul.

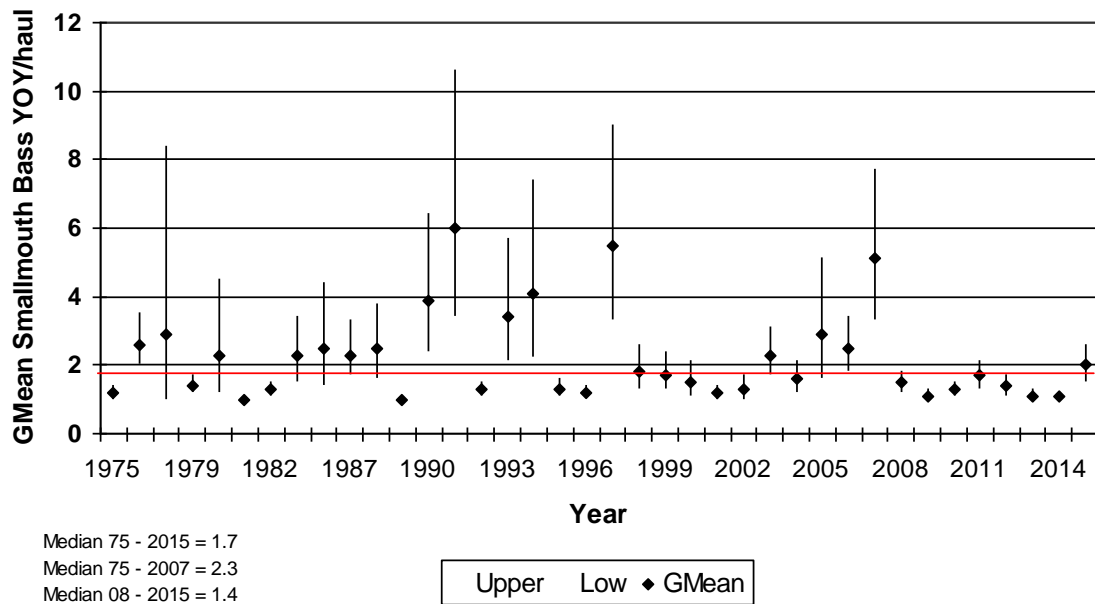


Figure 5. Annual geometric mean number of young smallmouth bass per seine haul captured from the **middle** Potomac River (Dam 5 downstream to Dam 3) 1975 - 2015. 95% confidence interval. Red line equals median value of 1.7 young bass per haul.