

2018 Smallmouth Bass Update

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Since 2012, there was modest to strong recruitment of juvenile Smallmouth Bass to the population at the middle and lower Susquehanna River and lower Juniata River, in part, attributable to lower disease prevalence among young-of-year (YOY) Smallmouth Bass. Although variable, disease prevalence, or the proportion of YOY Smallmouth Bass with signs of disease captured during backpack electrofishing surveys, has declined steadily at the middle reach of the Susquehanna River from a high of 67% in 2005 (Figure 1). Ongoing investigations into disease outbreaks have demonstrated that several pathogens likely contributed to mortality including bacterial pathogens, myxozoan parasites, cestodes, trematodes, and largemouth bass virus (LMBV; [Walsh et al. 2018](#), [Boonthai et al. 2018](#), [Schall et al. 2018](#)). A recent laboratory challenge study demonstrated that LMBV was pathogenic to juvenile Smallmouth Bass and likely a substantial contributor to mortality of YOY Smallmouth Bass residing in the Susquehanna River (Boonthai et al. 2018). Until that time, Smallmouth Bass were only thought to be carriers of the virus and not susceptible to its effects. Researchers also determined that signs of disease in Smallmouth Bass were different than those observed in Largemouth Bass and strains of the virus isolated from fish in the Susquehanna and Juniata rivers were more virulent than from areas less affected by disease (Boonthai et al. 2018). Coinfection with the bacterial pathogen columnaris increased the rate of mortality of LMBV in the laboratory (Boonthai et al. 2018) and corroborates the theory that a mixture of pathogens has likely affected fish health (Walsh et al. 2018). In addition to the impacts of pathogens, contaminant analysis of wild YOY Smallmouth Bass demonstrated exposure to several endocrine disrupting compounds; many of which were demonstrated to cause immune suppression (Walsh et al. 2018). A complex combination of pathogens and contaminant exposure likely resulted in past mortality; however, mortality has subsequently waned in recent years but still occurs at low levels in the system.

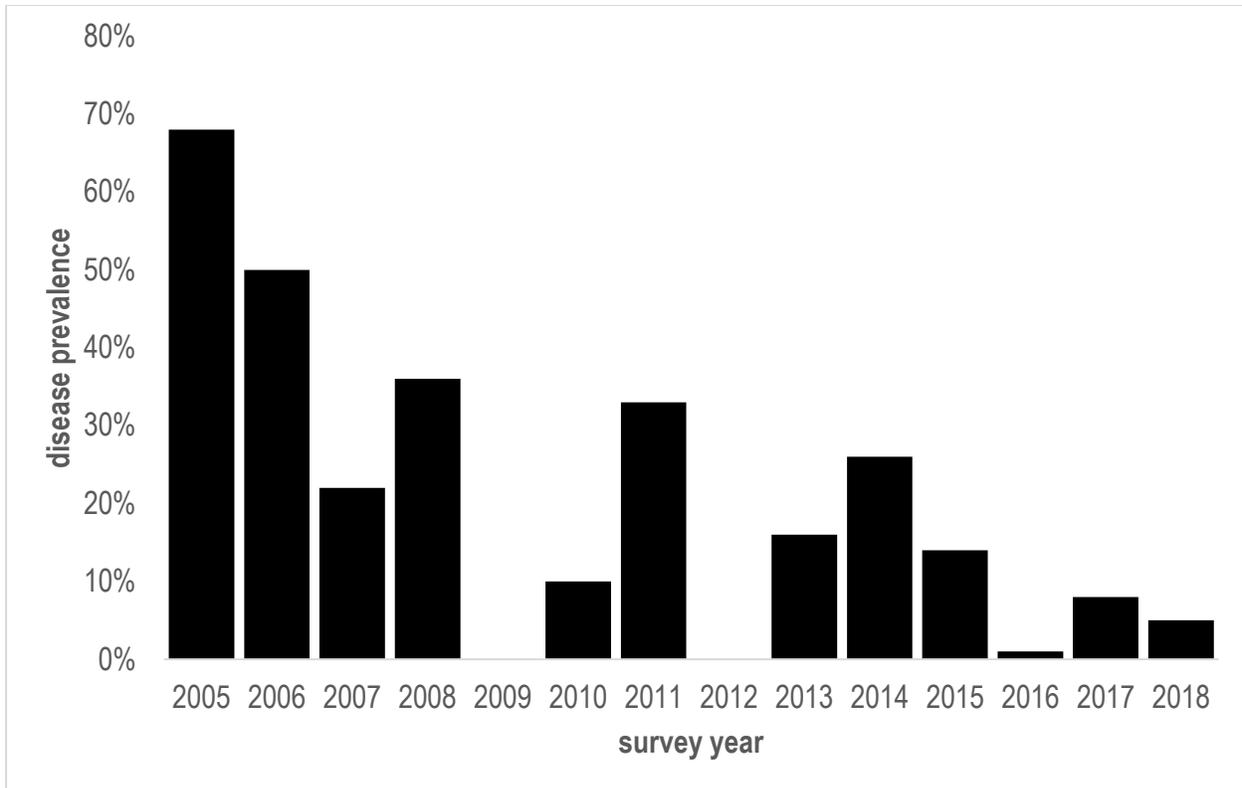


Figure 1. The proportion of young-of-year Smallmouth Bass with visible signs of disease, or disease prevalence, captured during backpack electrofishing surveys at the Susquehanna River between Sunbury and York Haven, Pennsylvania.

Abundance of adult Smallmouth Bass has increased and a shift in age structure has occurred as a result of increased recruitment. Catch rates of adult Smallmouth Bass (age-1 and older) determined during nighttime boat electrofishing surveys conducted at the Susquehanna River have increased recently and have been at or above the long-term median value during the period from 2016 to 2018 (Figure 2). The age distribution of Smallmouth Bass has changed in recent years at the Susquehanna River as the catch rate of younger fish has increased during surveys conducted from 2013 through 2017 (Figure 3). This represents a shift towards a population age structure more indicative of a functional population and similar to the period prior to disease onset (i.e., pre-2005). Like the Susquehanna River population, the lower Juniata River Smallmouth Bass population also shifted to a population characterized by a higher proportion of younger fish; similar to pre-2005 conditions. This change was attributable to good recruitment to the adult fishery of the 2012, 2013, 2014, and 2015 cohorts relative to other post-2005 year classes. Particularly, the 2015 year-class, which recruited exceptionally well to the adult fisheries. Although, this change occurred during the time period immediately after more restrictive regulation changes were applied, this segment of the population (i.e., small, sub-legal sized bass under previous Big Bass regulations) was not directly affected by regulatory changes as Catch-and-Release and Closed Season regulations only directly affected larger, adult fish.

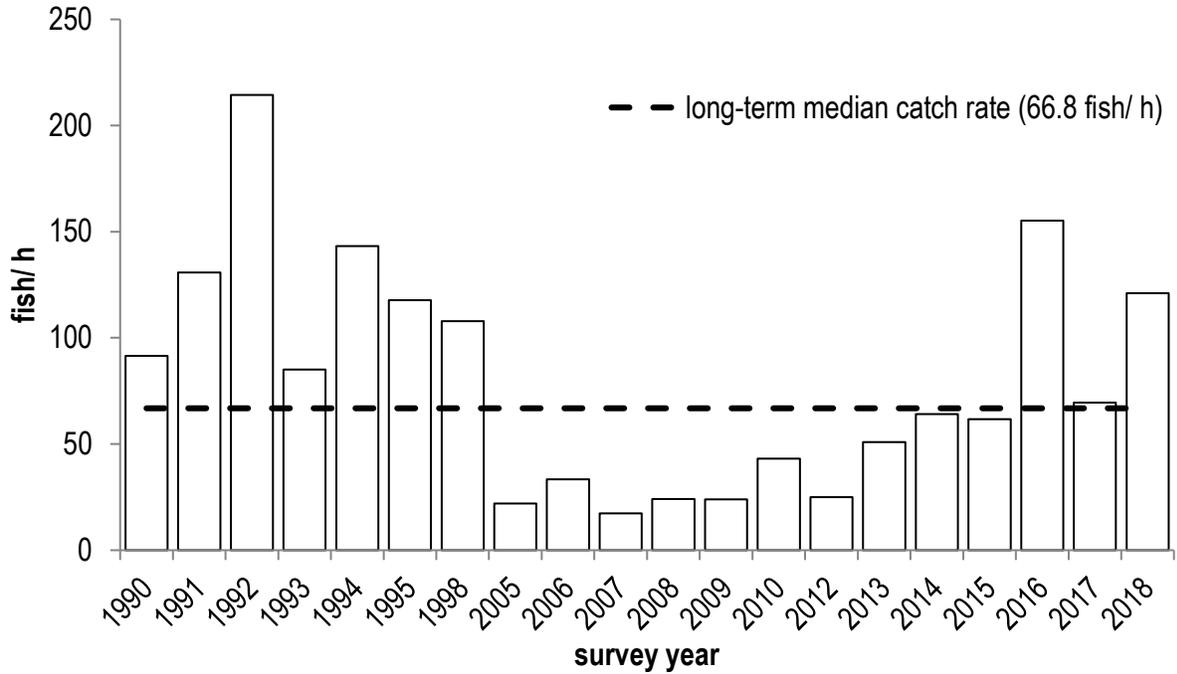


Figure 2. Boat electrofishing catch per unit effort (CPUE; fish/ h) of adult Smallmouth Bass (\geq age-1) at the Susquehanna River between Sunbury and York Haven, Pennsylvania from 1990 to 2018.

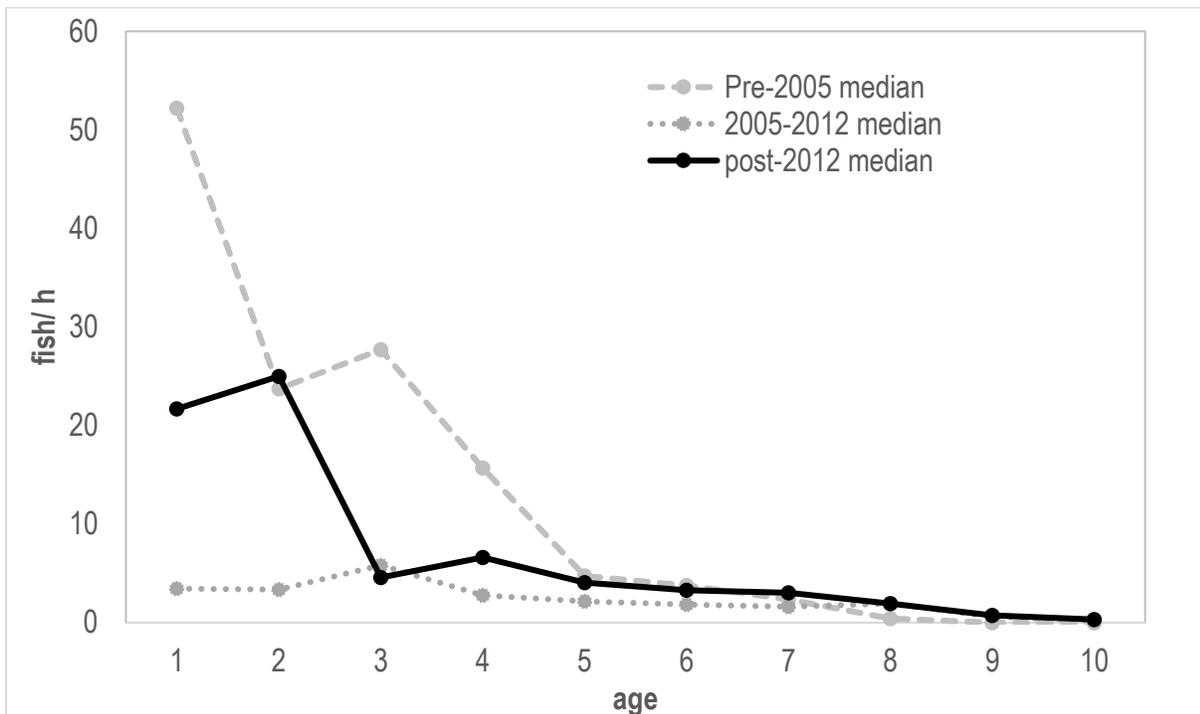


Figure 3. Median catch per unit effort (CPUE; fish/ h) at age of adult Smallmouth Bass at the Susquehanna River between Sunbury and York Haven, Pennsylvania from 1990 to 2017.

In response to positive changes in the Smallmouth Bass population, the Pennsylvania Fish and Boat Commission Board of Commissioners voted in July 2018 to remove the Closed Season regulation from the middle and lower Susquehanna River and lower Juniata River to allow anglers to fish for Smallmouth Bass and Largemouth Bass during the popular spring angling season beginning in 2019. Year-round Catch-and-Release and Closed Season regulations were implemented in 2011 and 2012 to further protect adult Smallmouth Bass until recruitment improved. Management of these populations moving forward will utilize an adaptive management approach that will apply monitoring data focused on specific components of the population to inform regulatory changes as needed to protect the resource while optimizing recreational angling opportunities within resource constraints.