

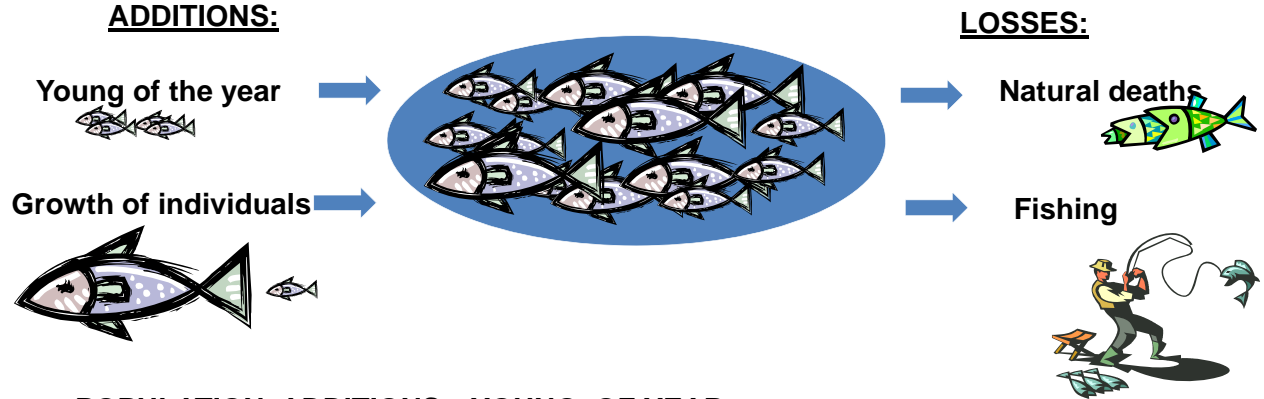
Smallmouth Bass *Micropterus dolomieu*

Life history – 3 part series



PART I

The abundance of smallmouth bass in Pennsylvania’s Susquehanna River system changes annually and is influenced by smallmouth bass added and lost each year.



POPULATION ADDITIONS---YOUNG OF YEAR:

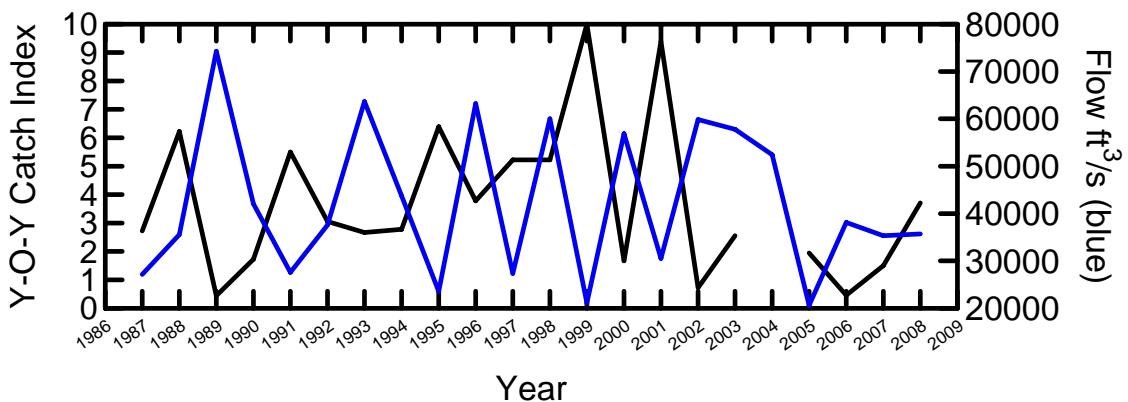
+Addition of young begins with nest building by the male when water temperatures reach 59°F.

+After spawning the male “guards” the nest until eggs hatch and fry disperse (note eggs in foreground of photo)



Source: <http://www.aaso.org/photos/showphoto.php?photo=62&size=big&sort=latest>

+River flow or discharge (blue line) has great influence upon the annual abundance of young of year smallmouth bass (Y-O-Y, black line); with low flow yielding high abundance and high flow typically yielding low annual abundance of bass.



+Regular addition of young fish to the population and their survival to adulthood is one of the most important features influencing smallmouth bass abundance and fishing quality.



Smallmouth Bass *Micropterus dolomieu*

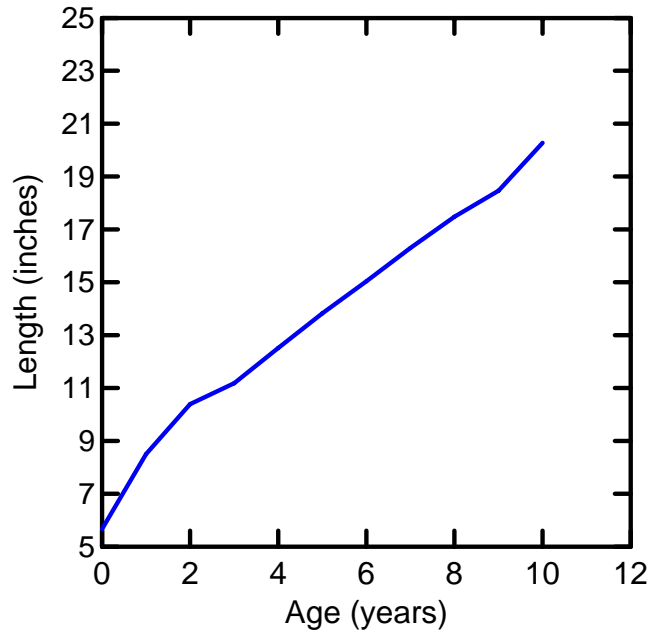
Life history – 3 part series

PART II

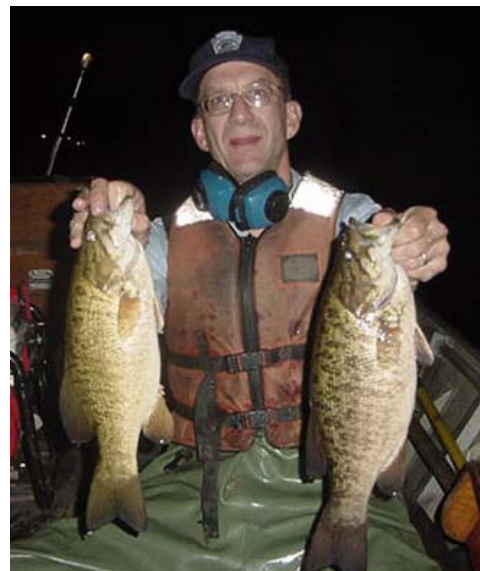
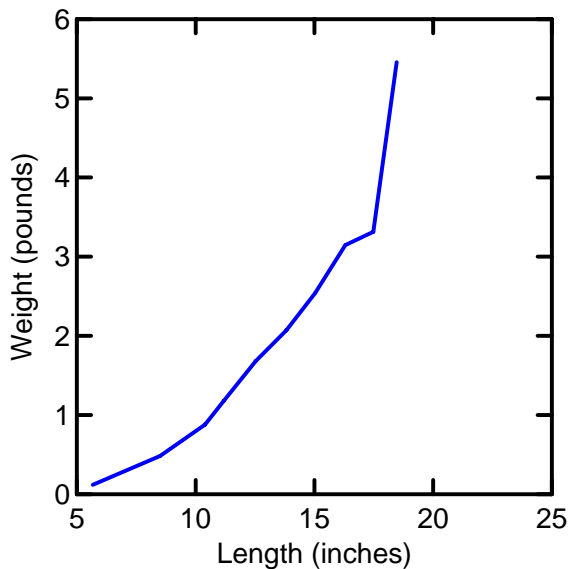


POPULATION ADDITIONS---GROWTH OF INDIVIDUALS:

- +Addition of biomass or “weight” to the population occurs in association with growth.
- +Smallmouth bass consume a variety of crustacean (crayfish) insects, and fish species.
- +On average smallmouth bass within the Susquehanna River basin attain a length of 12 inches by age 4, 15 inches by age 6 and 18 inches by age 8.5.



- +On average a 12 inch smallmouth bass in the Susquehanna River will weigh approximately 1.5 pounds, a 15 inch smallmouth bass will weigh 2.5 pounds.



Smallmouth Bass *Micropterus dolomieu*

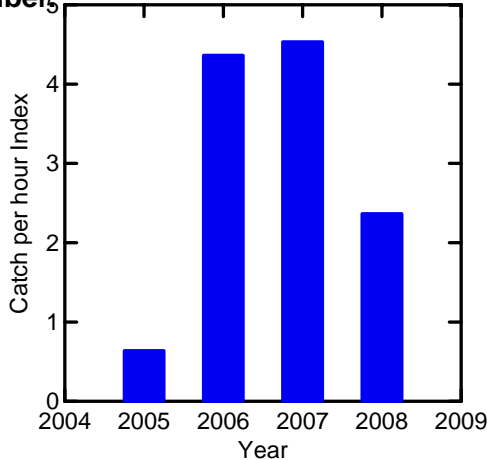
Life history – 3 part series

PART III

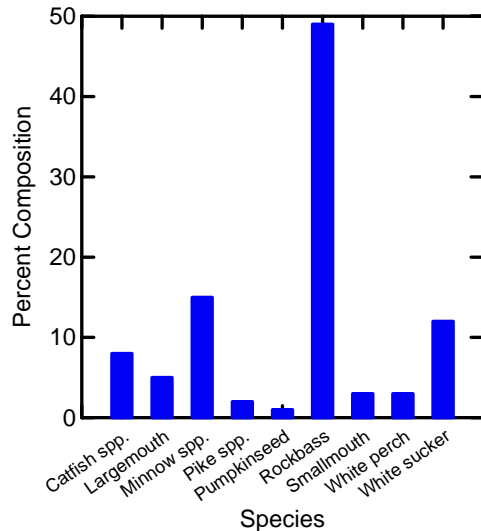


POPULATION LOSS---NATURAL MORTALITY:

+Predation on smallmouth bass by fishes such as flathead catfish and walleye are known to occur. In the Susquehanna River system flathead catfish are an invasive species and beginning to increase in numbers



Source: http://www.sj.ubum.edu/fish/image_gallery/details.php?image_id=1323



+Predation upon smallmouth bass by double crested cormorant occurs, but smallmouth bass comprise a relatively small component of their diet based upon stomach examination of a sample from Wade Island by USGS scientists (data courtesy R. Ross, USGS Wellsboro, Pa).

POPULATION LOSS---FISHING MORTALITY:

+A creel survey conducted in 2007 by the Fish and Boat Commission documented catch of 90,118 legal size smallmouth bass from the Big Bass segment of the Susquehanna and Juniata Rivers. Of these smallmouth bass 6,124 were harvested—7%. Since bass could be caught multiple times, this percent does not measure annual fishing loss, nonetheless it illustrates that harvest of smallmouth bass is low.



Susquehanna River Drainage Young-of-Year Smallmouth Bass 2005-8 Fish Disease Investigations



The presence of three factors are necessary for disease to occur:

- A SUSCEPTIBLE HOST
- A VIRULENT PATHOGEN
- A PREDISPOSING ENVIRONMENT

The interaction of these three factors determine if a disease will occur, the severity of the disease, and the duration of the disease. Improving environmental conditions can prevent or reduce the severity of a disease outbreak.



What factors may be contributing to disease epizootics in the young of year smallmouth bass populations in the Susquehanna River drainage?

ENVIRONMENTAL

High water temperatures are conducive to bacterial growth.
Low dissolved oxygen levels cause respiratory stress.
Other factors may be involved that have not been identified.

DISEASE PATHOGENS



Low level external parasite infestations and fungal infection.



Photo by Dr. Vicki Blazer, USGS, Leetown Science Center National Fish Health Research Laboratory

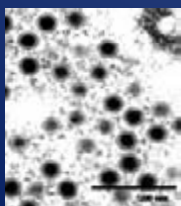
Varied levels of larval trematode infestations of liver tissues.



Flavobacterium columnare (Columnaris disease).

Soil and water bacteria.
Significant epizootics can occur above 56°F.
Optimum growth at 82-96°F.
External and internal infections detected.

Largemouth Bass Virus Identifications (red)



Micrograph by Dr. John Grizzle, Auburn University



Map by Andrew Noyes, pathologist, NYDEC

Largemouth bass virus

Causes mortality in adult largemouth bass, but it is not known to be a primary cause of disease in young fish or other fish species.
Carrier infections have been documented in bluegills, red-breasted sunfish, smallmouth and spotted bass, white and black crappie, and Suwanee bass.