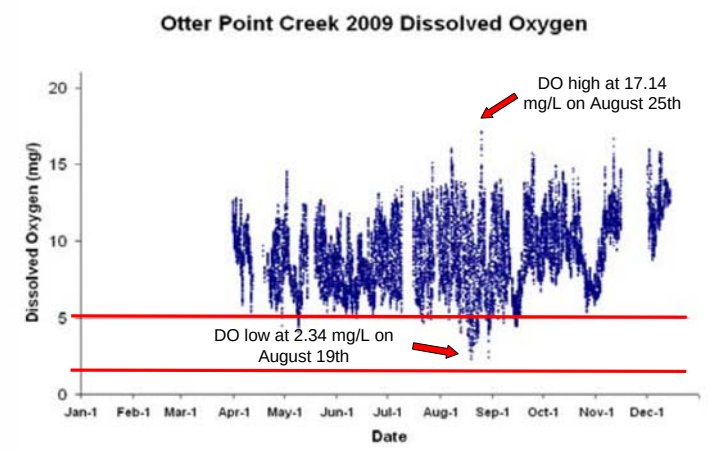
Water Quality of the Bush River

Dissolved Oxygen



Continuous Monitoring Site Otter Point Creek	2008	2009
Dissolved Oxygen less than 5 mg/l	10.01%	3.96%
Dissolved Oxygen less than 3.2 mg/l	1.17%	0.15%

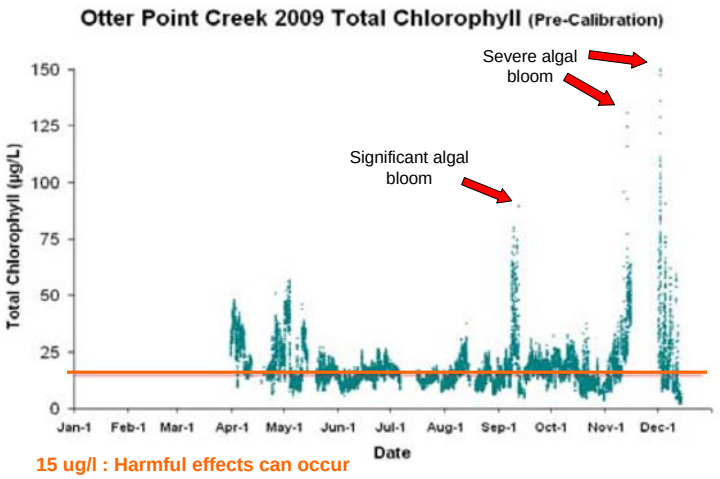
Dissolved Oxygen criteria failure at Otter Point Creek during July through September for 2008 and 2009.

< 5 mg/L fail water quality standard

Fish kills

- High temperatures decrease the amount of dissolved oxygen in the water.
- The average DO level during the summer months in 2009 was about **8.6 mg/L** which provides a healthy environment for plants and animals to survive

Chlorophyll



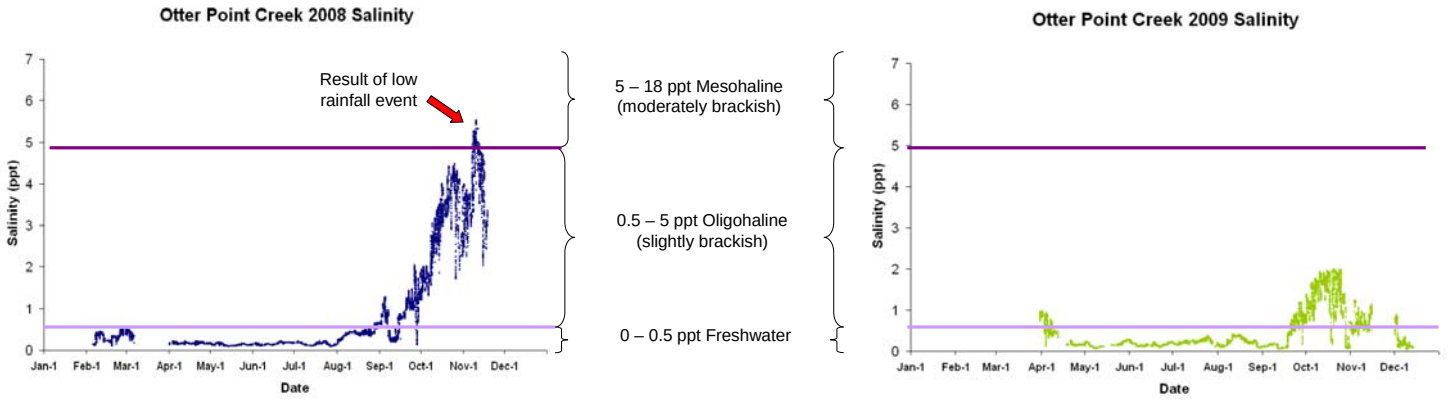
15 ug/l : Harmful effects can occur
50 ug/l : Significant algal bloom
100 ug/l: Severe bloom

- Chlorophyll concentration is a measure of phytoplankton biomass in the water.
- Excess nutrients in the water stimulate algal growth.
- Algal blooms prevent sunlight from penetrating the water by covering the water surface. The decomposition of algae decreases the oxygen available in the water column. Oxygen below 1-2 mg/l leads to fish kills.

Continuous Monitoring Site Otter Point Creek	Months	2008	2009
Readings greater than 15 ug/l	March - May	59%	70.88%
	July - September	48%	47.23%
Readings greater than 50 ug/l	March – May	0%	0.40%
	July – September	0.33%	1.31%
Readings greater than 100 ug/l	March – May	0%	0%
	July – September	0%	0%

Chlorophyll criteria failure at Otter Point Creek in 2008 and 2009.

Salinity



- Salinity is the primary factor affecting SAV distribution.

Find the SAV poster to learn more!

Chesapeake Bay National Estuarine Research Reserve Maryland

Maryland Department of Natural Resources

How YOU Can Help:
Ways to Prevent Nutrient Pollution

1.Limit lawn fertilizer use and apply at appropriate times.

Nutrients in chemical fertilizers can runoff yards into local waterways and eventually drain into the Bush River and Chesapeake Bay. If you must fertilize, follow the application instructions and do not over-fertilize.

2. Help to control runoff and soil erosion from your property.

Reducing erosion and preventing runoff will reduce the amount of sediments and nutrients entering the watershed.

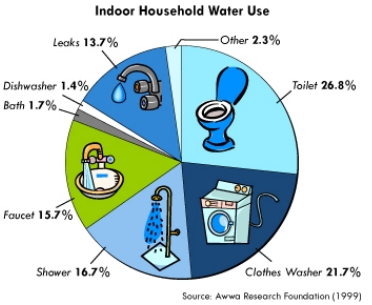
Use rain barrels!!

3. Start a compost pile and recycle yard waste.

This will minimize the amount of trash produced in your home. The compost can also serve as a natural fertilizer for your lawn!

4. Conserve water and energy.

The more water we use, the more we must treat either through septic systems or water treatment plants. Repair leaking faucets, install low-flow faucets and toilets, only wash full loads of laundry.



5. Plant trees and native plants.

Trees filter polluted runoff, reduce soil erosion, and control runoff from your yard.

MARYLAND
Smart, Green & Growing
Marylanders Plant Trees

6. Maintain your septic system.

Without regular pumping, septic tanks can fail, which not only harms the environment but can also contaminate drinking wells.

MARYLAND DEPARTMENT OF NATURAL RESOURCES

Chesapeake Bay National Estuarine Research Reserve Maryland

Chesapeake Bay Program
A Watershed Partnership

Freshwater Fish of the Bush River

Most Common Species Found

Juvenile freshwater fish at Otter Point Creek are surveyed from July to September through a volunteer-driven monitoring program

Seine

Spot tail shiner
(Notropis hudsonius)

Blueback herring
(Alosa aestivalis)

Both

White perch
(Morone americana)

Gizzard shad
(Dorosoma cepediamum)

Atlantic menhaden
(Brevoortia tyrannus)

Trawl

Brown bullhead catfish
(Ameiurus nebulosus)

Pumpkinseed
(Lepomis gibbosus)

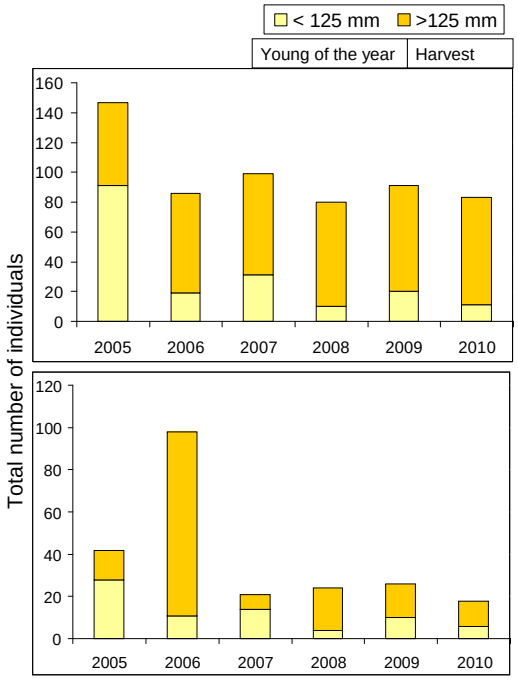
Commercially Important Species

- Fish are considered commercially important when they are caught and used for profit
- Commercial fishermen use a variety of fishing gear to harvest fish and other seafood

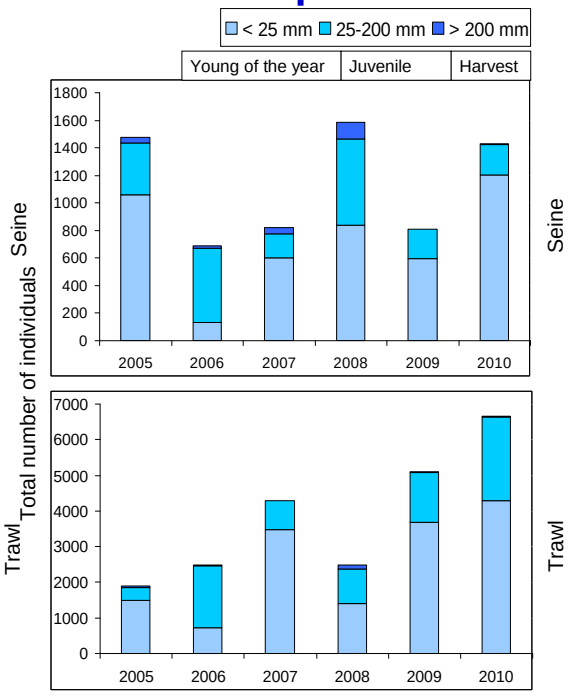
Yellow perch
(Perca flavescens)

- More yellow perch are found while seining
- White perch are found more commonly while trawling
- White perch is the most abundant species found using both trawling methods

Yellow perch



White perch



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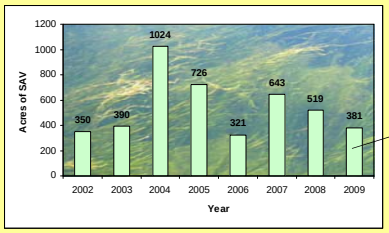
Health of the Underwater Grasses (SAV) of the Bush River



Restoration Goal of 350 acres was **exceeded by 9%** in 2009

SAV abundance in the Bush River, 2002 – 2009. Data from 2006, 2007-2008, and 2009 Annual Bush River Reports.

- In 2007 - Total SAV acreage increased by 98% to 643 acres
- Of the 643 acres, 66% were HIGH density beds
- In 2008 - Total SAV acreage decreased by 19% to 519 acres
- Majority of the acreage were HIGH density beds
- **In 2009 - SAV continued a two year decline in acreage**
- **Of the 381 acres, 28% were HIGH density beds**

What does SAV need to grow?

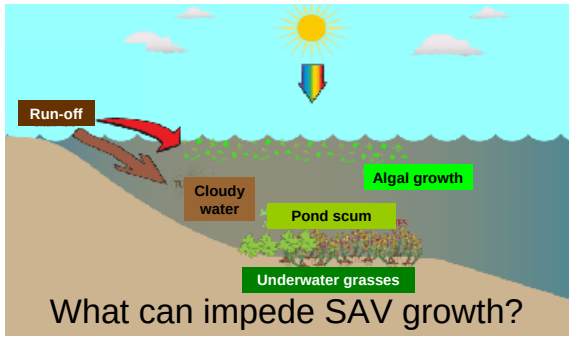
LIGHT

DISSOLVED OXYGEN

SEDIMENT

NUTRIENTS

CLEAR WATER



What can impede SAV growth?

"The Line-Up" – Most Common Species 2002 - 2010

"Hydrilla"
(*Hydrilla verticillata*)
Present since 2002

"Wild Celery"
(*Vallisineria americana*)
Present since 2002

"Watermilfoil"
(*Myriophyllum spicatum*)
Present since 2002

"Coontail"
(*Ceratophyllum demersum*)
Present since 2002

"Common Waterweed"
(*Elodea canadensis*)
2002 – 2008 (except 2006)

"Curly Pondweed"
(*Potamogeton crispus*)
2002 - 2003

Native | Non-native | No longer present | Left, came back

"Southern Naiad"
(*Najas guadalupensis*)
2004 - 2005

"Water Stargrass"
(*Heteranthera dubia*)
2002 - 2004

"Spiny Naiad"
(*Najas minor*)
2003 - 2005

"Horned Pondweed"
(*Zannichellia palustris*)
2002 – 2004; 2007 - 2009

"Slender Pondweed"
(*Potamogeton pusillus*)
2002 -2004; 2009