

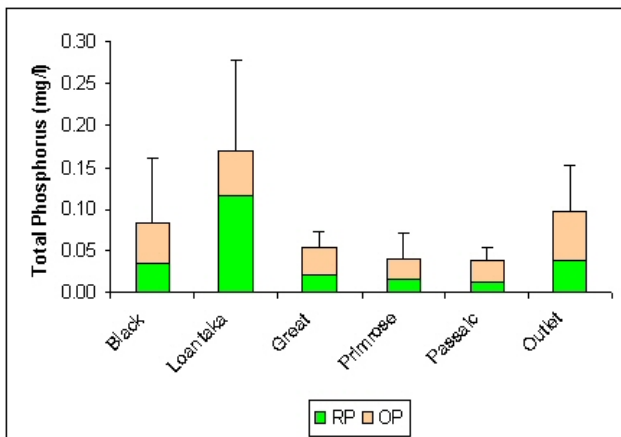
Great Swamp Water Quality Sampling (1999-2007)

By: GSWA Stream Team

Water samples are collected from each of the five primary streams entering Great Swamp Wildlife Refuge and from the outlet of Great Swamp at Millington Gorge. Samples are collected both during dry baseflow conditions and following storm events.

The samples are analyzed for Dissolved Reactive Phosphorus, Total Phosphorus, Nitrates+Nitrites, Total Kjeldahl Nitrogen, and Suspended Solids. The graphs below show the mean baseflow concentrations (mg/l) of each substance based on 43 baseflow samples collected over nine years.

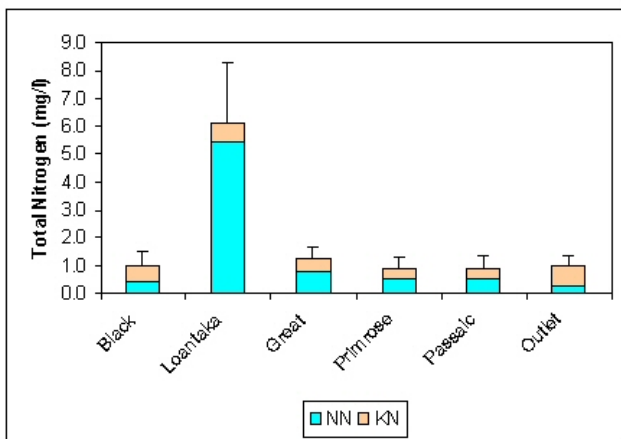
Over-enrichment of phosphorus (too much) can lead to excess growth of algae and aquatic plants, altered composition and diversity of the aquatic community, and potential human health problems.



Phosphorus can enter a water body from soil erosion, fertilizers and wastewater treatment facilities.

Phosphorus quickly binds to soil particles and plant roots but then can be released from bottom sediments during anoxic (without oxygen) conditions or from decaying plants. The concentration of dissolved reactive phosphorus provides an estimate of the amount of phosphorus in a form readily usable by plants and algae.

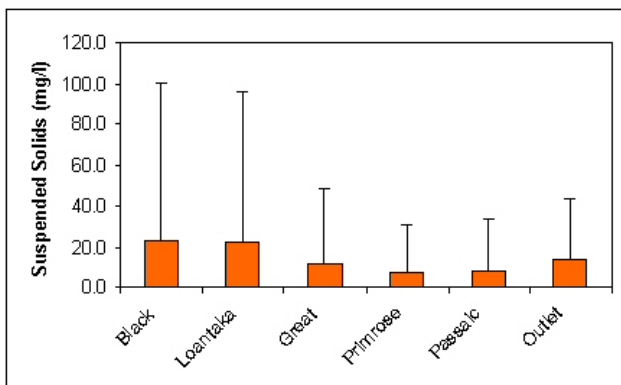
Loantaka and the Millington Gorge outlet contain very high levels of phosphorus with moderately high levels found in Black Brook.



Nitrogen can enter a water body from acid rain, fertilizers, animal waste, and wastewater treatment facilities.

Nitrogen moves easily through soil into the groundwater. Some algae and plants convert gaseous nitrogen to usable forms (nitrogen fixation) while some bacteria convert usable forms into gaseous nitrogen (denitrification). Although the concentration of nitrates + nitrites provides one estimate of the amount of nitrogen readily available for use by plants and algae, rapid changes in form make all of the nitrogen easily available for use.

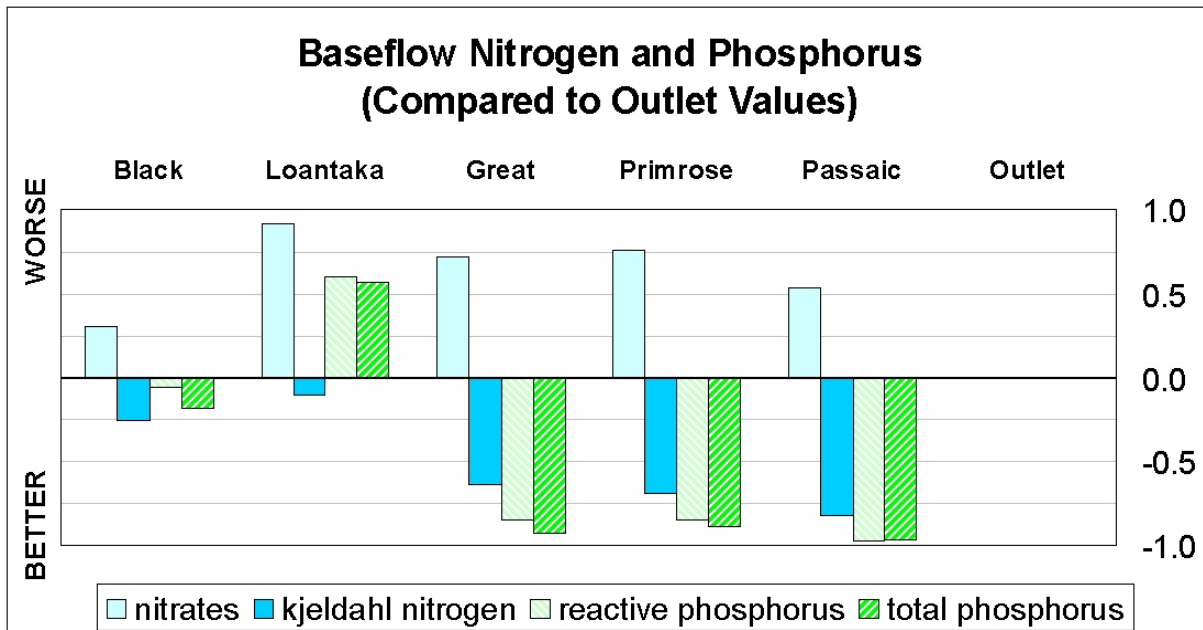
Loantaka Brook contains very high levels of nitrogen while the Millington Gorge outlet contains moderately high levels.



Surface soil erosion and stream channel erosion increase sediments (suspended solids) in surface water.

Increased sediment causes turbidity, which can have a detrimental effect on aquatic life. Sediment is also important as it transports phosphorus and other compounds, including toxic substances.

Black and Loantaka Brooks contain particularly high levels of suspended solids. The Millington Gorge outlet contains moderately high levels of suspended solids.



This graph compares baseflow concentrations to the Millington Gorge outlet. All of the streams have a higher concentration of nitrogen than the outlet but only Loantaka Brook is worse than the outlet for phosphorus.

So, what can you do to help improve the water quality of these streams? Here are a few suggestions:

1. Before you decide to fertilize your lawn, have your soil tested at the Rutgers Cooperative Research and Extension office (<http://njaes.rutgers.edu/soiltestinglab/>) to determine if you need to fertilize and, if so, which elements of fertilizer your soil requires. If possible, use natural and slow-release nitrogen fertilizers and make sure to follow the manufacturer's directions. Never apply to your lawn or garden if the weather calls for rain.
2. Always pick up pet waste! Not only is this a source of nutrients but it also contains bacteria that can contaminate your drinking water as well as kill fish, wildlife, and plants.
3. Shop for nonhazardous, biodegradable and phosphorous-free household cleaning products. Don't wash your car at home because the cleaning products you use go directly into the storm sewer system and eventually into our streams.
4. Divert rain from paved surfaces onto grass to permit gradual infiltration.

Should you have any questions or concerns regarding this report, please contact GSWA's Director of Water Quality Programs, Kelley Curran at kcurran@greatswamp.org or 973-538-3500 x16.