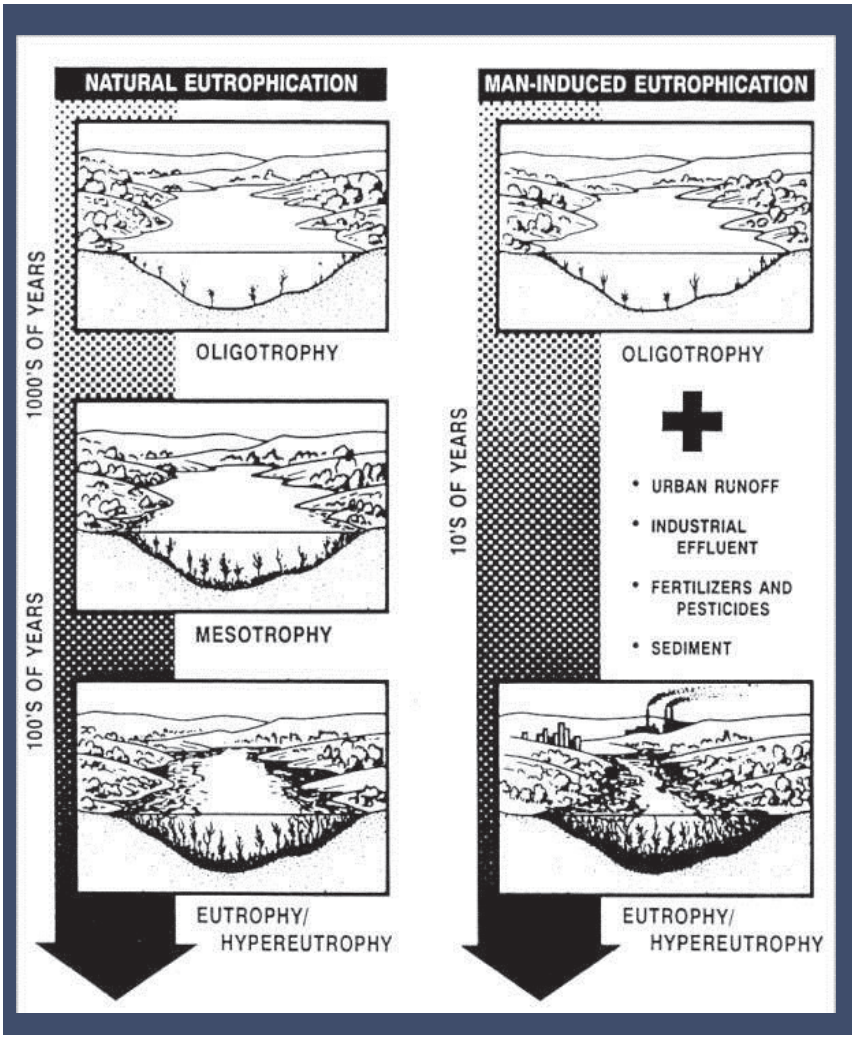
Why is Pow Wow Pond filling with vegetation?

Pow Wow Pond is a water body located in Kingston, New Hampshire. In past decades it was widely used by families as a summer destination for swimming, boating, water skiing, and fishing. However in recent years this pond has gone through some noticeable changes. A once blue, healthy pond is now filled with overbearing amounts of vegetation along the southern edge.

Ponds naturally fill with vegetation at a slow rate through a process called eutrophication. Eutrophication is the ecosystem's response to the addition of nutrients from the plants and animals that die and sink to the bottom each year, causing more plants to grow and the pond to slowly fill turning into land after thousands of years.

However, the vegetation growing in Pow Wow Pond is different for two reasons. The native vegetation is growing abnormally fast, covering the surface of the pond in only a decade, and there are several invasive plant species that have recently been introduced.



Photos taken from: Pow Wow Pond Council website

Invasive Species

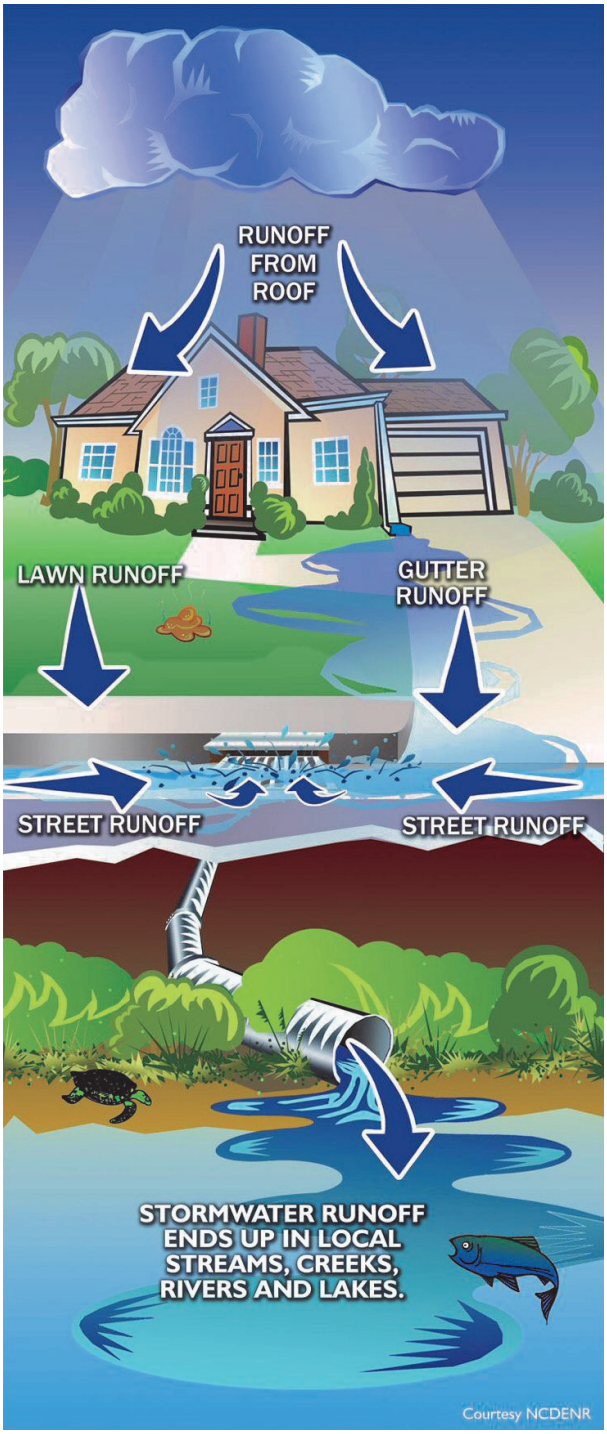
An invasive species, sometimes also referred to as an exotic species, is one that is not native to the area. This means that it does not have any natural predators and can outcompete other local species, quickly taking over an ecosystem. There are a few invasive species that affect Pow Wow Pond, but the primary one is Milfoil.

To get rid of Milfoil you can spray herbicides into the pond, which has been done in the past, however the plant did not completely go away and the herbicides can negatively affect other plants. A more effective method is to pull them out by hand, as seen below, but this is very time intensive. For more information about preventing the spread of Milfoil see: *NH DES Exotic Species Program*.

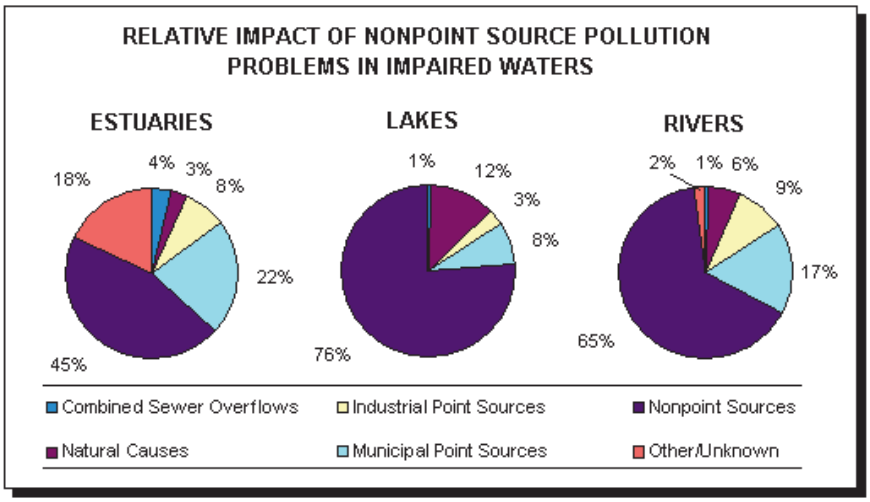
The "Fertilizer Effect"

Are you wondering what causes the plants to grow faster? Faster growth rates are due to the "fertilizer effect" (man-induced eutrophication). The "fertilizer effect" is caused by an increase in the amount of available plant-essential nutrients, particularly nitrogen and phosphorus, entering the pond. Where do these nutrients come from and how do they get into the pond?

How are you playing a role in the "fertilizer effect"?



Nitrogen and phosphorus naturally exist in the environment and are essential to the health and growth of plants. However, a variety of human actions also add nitrogen and phosphorus to the pond ecosystem. These nutrients are found in lawn and garden fertilizers, pet waste, and septic systems. When too much of these nutrients are present their effects actually become negative creating so much plant growth it actually chokes the pond, in this case these nutrients are actually considered a form of non-point source pollution. This is pollution that is not from a specific place such as a factory or wastewater treatment plant, but rather from a wide range of locations (yards, gardens, farms, driveways, etc.) and therefore the amount of the pollutant is difficult to measure.



(Welsch, 1991)

While the fertilizers you put on your lawn or garden may not seem to matter much they can easily be washed into the pond during a large rain event. This stormwater runoff also carries nutrients from pet waste as well as other types of non-point source pollutants including sediments, road salts, bacteria, oil and gasoline. Likewise a leaky septic system can leach the same nutrients into the surrounding soil, which is then carried via groundwater to the pond during even a normal rain event. If this is the impact that just one home can have, consider the impact of all the homes around Pow Wow Pond. While the most visible problem is excess plant growth that makes for poor boating and swimming conditions there are a multitude of other possible problems lying just beneath the pond's surface.

For more about these problems and why we should all care about slowing the eutrophication of Pow Wow Pond see the flyer entitled: ***Why should everyone care about the vegetation in Pow Wow Pond?***

References

David J. Welsch (1991), "Riparian Forest Buffers: Function and design for protection and enhancement of water resources". http://www.na.fs.fed.us/spfo/pubs/n_resource/buffer/part3.htm

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