

Watershed Wisdom – Roads and Driveways

Last week we talked about nutrient enrichment of the lakes (“eutrophication”) and the importance of limiting phosphorous inputs. As we discussed, phosphorous (P) loading to lakes is complex and includes many sources. Some P is continually entering via atmospheric deposition (typically ~15%, can be more in dusty areas). Anyone who has left their car sitting in the driveway for a few weeks without moving it knows how much dust can accumulate. Some of that dust contains phosphorous (P), with the percentage increasing if there is a lot of pollen or dust blowing off freshly fertilized agricultural fields. Some P comes in dissolved in the water of tributary streams and rivers. Some comes in via groundwater, especially in areas with faulty septic systems or in agricultural areas. Some comes in as plant debris or blowing leaves or grass clippings illegally dumped in the lake in a form that is referred to as “organic phosphorous.” Organic phosphorous (OP) is phosphorous that is bound up into organic matter already and not bioavailable to another cell unless the first one dies and decomposes or is eaten and digested by another. This can be done by the Canada geese in the Belgrade stream who spend the day eating grass and other plants containing OP and then deposit roughly a kilogram a day of highly enriched goose manure either directly into the lake on the shore where it washes in when it rains. This process converts most of the OP to soluble reactive phosphorous (SRP). SRP is dissolved within the water column, primarily in the form of orthophosphate ions, which are “bioavailable” in the sense they can be readily picked up by living organisms and turned into organic matter. Most of the rest of the phosphorous in aquatic systems is typically in particulate form, bound to suspended solids, primarily iron and clay minerals.

Phosphorus-laden sediment generally comprises the significant majority of phosphorous loading to lakes, with the amount of phosphorous washing into the lake being highly dependent on the land use of the surrounding watershed. Phosphorous loading is very low from forests but very high from agricultural areas or highly developed watersheds with a lot of impervious surfaces such as buildings or roads. Studies of phosphorous loading to Maine lakes have generally concluded that a substantial (>30%) amount of the phosphorous washing into the lake is coming from roads and driveways, especially dirt roads in the near shore area. Many of the roads in the vicinity of our lakes are in poor condition. In many cases they were built more than 50 years ago and were basically paths cut through the trees to get a vehicle down to the seasonal camp on the lake a couple of times a summer. Often these roads were cut straight down the hill, sloping directly to the lake. Today, many of these same roads, with minimal upgrades, are now serving multiple camps and year-round houses with tens of trips per day of people coming and going to work, school, shopping, etc. These roads may have unstable culverts, inadequate or eroding ditches, poor road surface material, inadequate sub-base drainage, and lack adequate maintenance, all of which contribute to erosion and increased phosphorous washing into the lake.

The BRCA has conducted nonpoint source pollution (NPS) surveys of all the Belgrade Lakes and all the surveys identified roads as a major source of phosphorous loading. These reports are posted on our web site at www.belgradelakes.org/water.html if you want to check your home lake. To help remediate some of the pollution sites identified, we have obtained a number of DEP funded grants to provide some help for

road owners to upgrade their roads. In partnership with Kennebec County Soil and Water Conservation District (KCSWCD) we are currently providing some cost share support to residents of the East Pond Watershed and have recently received preliminary approval for a grant for Long Pond for 2009 and 2010. If you live in one of these watersheds and are interested in improving your road, please contact me at 495-6039. Even if your watershed is not eligible for grant money we can still provide advice and outreach materials on how to improve your road. We have copies of DEP's Camp Road Maintenance Manual available at BRCA or you can download the manual on line at: <http://www.maine.gov/dep/blwq/docwatershed/camproad.pdf>. This manual contains a lot of good information about how to maintain your road to improve water quality.