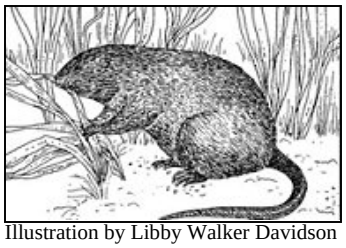
Illustration by Libby Walker Davidson

WETLANDS FACT SHEET

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Topic: Stormwater and Wetlands — February 2003

BACKGROUND

Water that falls on the land as precipitation may infiltrate into the ground, evaporate, be taken up by plants, or flow over the land as surface runoff. The amount of runoff that occurs in an area will depend on the soil type, soil moisture, slope, intensity of precipitation, and type of land cover, as well as other factors. In general, areas of the landscape that are naturally vegetated have much less surface runoff than urban areas. The greatest amount of runoff occurs in urban areas with high percentages of impervious surfaces, such as paved roads and parking lots.

Stormwater runoff from urban areas typically contains many contaminants, including oil, grease, gasoline, road salts, fertilizers, pesticides, and trace metals. Phosphorus and contaminants may be bound to the soil particles of the sediments carried in the runoff. All of these components of stormwater runoff can have serious negative impacts on the water quality and biota of streams, rivers, ponds, and wetlands.

STORMWATER IMPACTS ON WETLANDS AND WETLAND FUNCTIONS

Although wetlands are known to be effective at improving the quality of contaminated water that flows through them, most wetlands cannot withstand the long-term discharge of contaminated stormwater without impacts to the integrity of wetlands and the functions they provide. Any of the functions provided by wetlands may be impacted by stormwater. Actual impacts will depend on the type of wetland as well as the quantity and quality of the stormwater discharged. The following are some of the types of wetland impacts typically encountered.

Large volumes of stormwater discharged at high velocities into a wetland or wetland buffer zone can create erosion channels in the wetland. The channelized flow of stormwater through the wetland will reduce the wetland's ability to store floodwaters and to improve the quality of the water. The higher water velocities discharged from these wetlands may also erode stream banks, resulting in impacts to water quality and fisheries.

The introduction of nutrients, contaminants, and sediments into wetlands may result in a number of changes. Although a wetland may be effective at removing some of the nutrient and pollutant load for a few years, it is likely that over a longer period of time the wetland's effectiveness will drastically decrease. Some wetlands have very limited amounts of available nutrients under natural conditions, and the introduction of nutrients can drastically change the plant species composition. The filling of a wetland with sediments adversely impacts many functions by changing the hydrologic regime and the plant species composition. Very heavy loads of contaminants can kill vegetation and the biota which occur in the soils.

In general, it has been found that the long term introduction of improperly managed stormwater into wetlands results in a decrease in the number of plant species present, with a shift to more tolerant species such as cattails and the nuisance species, purple loosestrife and common reed. This can have a significant impact on wetland functions, such as wildlife habitat.

MINIMIZING STORMWATER IMPACTS

The impacts of stormwater discharge to wetlands and other surface waters can be minimized by carefully designing a project and implementing stormwater management techniques. The objective of stormwater management is to maintain the pre-development hydrology and water quality of a site after development. The management techniques can be generally categorized as volume control, peak discharge control, groundwater recharge, and treatment of water quality. The appropriate technique(s) will depend on the actual site conditions. The following is a summary of some of the more commonly used and more effective treatment techniques.

Overland flow is stormwater which is not collected and is allowed to flow through the soil and vegetation of natural buffer strips, allowing infiltration to occur. This is especially effective at removing sediments, and is less effective for the removal of soluble pollutants.

Grassed swales can be constructed in situations where overland flow is not possible. These are most effective at removing particulate pollution, if constructed on extremely gentle slopes in areas of permeable soil.

Detention basins can be designed to remove sediments and many urban pollutants and to control post-development flows. They rely primarily on settling to remove sediments and particulate pollutants. They may be designed as dry basins that only fill with water during storm events, or as permanent ponds. These "wet detention basins" utilize both settling and biological action and are, therefore, effective at removing both particulate and soluble pollutants. The effectiveness of these wet basins can be further enhanced by creating areas of marsh in the basin, if these areas are properly maintained.

STATE REGULATIONS

A Conditional Use Determination will be required from the Agency of Natural Resources under the Vermont Wetland Rules for any construction work in Class Two wetlands and associated 50-foot buffer zones, including new stormwater facilities and stormwater discharge. For more information contact the Wetlands Office at the address above.

For new projects that include a discharge of stormwater, a Discharge Permit may be required from the Agency of Natural Resources. The Stormwater Section of the Water Quality Division will need to review these projects.

For more information about this program contact:

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