**(Goal Post Article 3)**

**Conservation Commission Information:**

**The Importance of Natural Vegetation to Wetland Resources**

(August, 2014)

**Erosion Protection:**

The most serious form of soil degradation is from accelerated erosion. Erosion is the washing or blowing away of surface soil, sometimes down to bedrock. While some erosion takes place without the influence of humans, barring disastrous storms, the soil is lost so slowly that it is usually replaced through natural processes of decay and regeneration - soil loss and creation of new soil stay in balance.

What keeps soil in a natural state from eroding is vegetation. In undeveloped places, soil is usually covered by a canopy of shrubs and trees, by dead and decaying leaves or by a thick mat of grasses or other plants. Whatever the vegetation, it protects the soil when the rain falls or the wind blows. The leaves and branches of trees and the cushion of lower story plants absorb the force of raindrops, and root systems of plants hold the soil together. Even in drought, the roots of native grasses, help tie down the soil and keep it from blowing away.

With its covering of vegetation stripped away, however, soil is as vulnerable to damage as a tortoise would be without its shell. Whether the plant cover is disturbed by cultivation, grazing, burning, or bulldozing, once the soil is laid bare to the erosive action of wind and water, the slow rate of natural erosion is greatly accelerated. Losses of soil take place much faster than new soil can be created, and a kind of deficit spending begins with the topsoil.

Organic matter in soil can absorb and store much more water than can inorganic matter. It acts like a sponge, taking up water and releasing it as required by plants. It also helps bind soil particles into larger aggregates, or crumbs. Soils with this kind of structure are very resistant to erosion. Conversely, nearly all soils containing little or no organic matter are very susceptible to erosion.

**The Importance of Natural Vegetation to Resource Areas**

As was explained in a prior article, the Conservation Commission helps oversee several wetland resource areas. These areas include:

• Bordering Vegetated Wetlands

• Land subject to flooding

• Riverfront areas (also protected through the Rivers Protection Act)

• Land under water bodies and waterways

• Banks of water bodies

Bordering Vegetated Wetlands (“BVW”):

The plants and soils of Bordering Vegetated Wetlands remove or detain sediments, nutrients (such as nitrogen and phosphorous) and toxic substances (such as heavy metal compounds) that are present in run-off and flood waters. Some nutrients and toxic substances are detained for years in plant root systems or in the soils. Others are held by plants during the growing season and released as the plants decay in the fall and winter. This latter phenomenon delays the impacts of nutrients and toxins until the cold weather period, when such impacts are less likely to reduce water quality.

BVW are areas where ground water rises to the surface and where, under some circumstances, surface water sinks into the ground water. The profusion of vegetation in BVW acts to slow down and reduce the passage of flood waters during periods of peak flows by providing temporary flood water storage and by facilitating water removal through evaporation and transpiration. This process reduces downstream flood crests and resulting damage to private and public property. During dry periods the water retained in BVW is essential to the maintenance of normal water levels in rivers and streams, which in turn is important to the protection of water quality and water supplies.

Land Subject to Flooding (“Floodplain”):

Wildlife depend on the distribution of water over time, plant community composition and structure, topography, soil composition and proximity to water bodies and BVW of these portions of floodplains for important food, shelter, and breeding areas. Nutrients from flood waters, as well as the inundation of floodplain soil, create important wildlife habitat characteristics, such as richness and diversity of soil and vegetation. A great many species require or prefer habitat which is as close as possible to water and/or has moist conditions, characteristics generally present on lower floodplains. Similarly, lower floodplains, because of their proximity to water and vegetated wetlands, can provide important shelter for wildlife which needs to migrate between such areas, or between such areas and uplands. The "edge" where floodplain habitat borders vegetated wetlands or water bodies is frequently very high in wildlife richness and diversity. Similar "edges" may be found elsewhere in the lower floodplain, where differences in topography and frequency of flooding have created varied soil and plant community composition and structure.

Finally, vernal pool habitat is found at various locations throughout the 100 year floodplain, the pool itself generally formed by meander scars, or sloughs left after the main water channel has changed course. These pools are essential breeding sites for certain amphibians which require isolated areas that are generally flooded for at least two continuous months in the spring and/or summer and are free from fish predators. Most of these amphibians remain near the breeding pool during the remainder of their lifecycle. Many reptiles, birds and mammals also feed here.

Riverfront areas:

The Riverfront area includes land up to 200’ from a river or perennial stream.

The presence of natural vegetation within riverfront areas is critical to sustaining rivers as ecosystems and providing the following public values. The riverfront area can prevent degradation of water quality by filtering sediments, toxic substances (such as heavy metals), and nutrients (such as phosphorus and nitrogen) from stormwater, nonpoint pollution sources, and the river itself. Sediments are trapped by vegetation before reaching the river. Nutrients and toxic substances may be detained in plant root systems or broken down by soil bacteria. Riverfront areas can trap and remove disease-causing bacteria that otherwise would reach rivers and coastal estuaries where they can contaminate shellfish beds and prohibit safe human consumption. Natural vegetation within the riverfront area also maintains water quality for fish and wildlife.

Land Under Waterbodies and Waterways (“LUWW”):

The physical nature of LUWW is highly variable, ranging from deep organic and fine sedimentary deposits to rocks and bedrock. The organic soils and sediments play an important role in the process of detaining and removing dissolved and particulate nutrients (such as nitrogen and phosphorous) from the surface water above. They also serve as traps for toxic substances (such as heavy metal compounds).

The plant community composition and structure, hydrologic regime, topography, soil composition and water quality of LUWW provide important food, shelter, migratory and overwintering areas, and breeding areas for wildlife. Certain submerged, rooted vegetation is eaten by water fowl and some mammals. Some amphibians (as well as some invertebrate species eaten by vertebrate wildlife) attach their eggs to such vegetation. Some aquatic vegetation protruding out of the water is also used for nesting, and many species use dead vegetation resting on land under water but protruding above the surface for feeding and basking. Soil composition is also important for hibernation and for animals which begin to burrow their tunnels under water. Hydrologic regime, topography, and water quality not only affect vegetation, but also determine which species feed in an area.

Banks of Waterbodies (“Banks”):

Where Banks are partially or totally vegetated, the vegetation serves to maintain the Banks' stability, which in turn protects water quality by reducing erosion and siltation. Banks may also provide shade that moderates water temperatures, as well as providing breeding habitat, escape cover and food, all of which are significant to the protection of fisheries. Banks which drop off quickly or overhang the water's edge often contain numerous undercuts which are favorite hiding spots for important game species such as largemouth bass (Micropterus salmoides).

The topography, plant community composition and structure, and soil structure of banks together provide important food, shelter, and breeding areas for wildlife. Topography plays a role in determining the suitability of banks to serve as burrowing or feeding habitat. Soil structure also plays a role in determining the suitability for burrowing, hibernation and other cover. Bank topography and soil structure impact the bank's vegetative structure, as well. Bushes and other undergrowth, trees, vegetation extending from the bank into the water, and vegetation growing along the water's edge are also important to a wide variety of wildlife. A number of tubers and berry bushes also grow in banks and serve as important food for wildlife. Finally, banks may provide important shelter for wildlife which needs to move between wetland areas.

Suggestions for future articles are welcomed and can be sent to the Conservation Commission at the Rowe Town Hall.

(The information for this article is largely from the Food and Agricultural Organization “How Soil is Destroyed” <http://www.fao.org/docrep/t0389e/t0389e02.htm> as well as from 310 CMR 10.54 through 310 CMR 10.58)

On behalf of the Rowe Conservation Commission (Myra Carlow, Chair; Virginia Gabert, Vice-Chair; Thom Chiofalo, Secretary; Bob Clancy and Prue Berry)

This article was submitted by Virginia Gabert