## RIPARIAN & SHORELAND BUFFERS

*Addressed by 5 management objectives, 9 action plans*

*"THE SIMPLEST AND MOST EFFECTIVE WAY TO PROTECT STREAMS, RIVERS, LAKES AND ESTUARIES IS TO LEAVE AN AREA OF UNDISTURBED NATIVE VEGETATION ADJACENT TO THE WATER BODY. THESE UNDISTURBED AREAS ACT AS BUFFERS BY PERFORMING FUNCTIONS THAT PROTECT WATER QUALITY AND ENHANCE WILDLIFE HABITAT. PRESERVING AND RESTORING RIPARIAN BUFFERS IS ESSENTIAL TO SURFACE WATER QUALITY PROTECTION."*

- New Hampshire Innovative Land Use Planning Guide, 2009

A naturally vegetated shoreland buffer (often referred to as a "riparian" buffer) provides shade, habitat, nutrient retention, water filtration, groundwater recharge, and flood attenuation capacity. Buffers also stabilize soil, thereby preventing erosion. A buffer typically includes the natural floodplain of a stream or river, and may encompass upland and wetland areas.

Development and other land use practices can negatively impact natural buffers and decrease the capacity for sediment and pollutant filtration and storm water retention. Erosion of unvegetated or sparsely vegetated buffers can increase the sediment load of streams and rivers. As wetland boundaries – both marsh and coastal – change and as storm surges increase with climate change, shoreland buffer protection is increasingly important.

The New Hampshire Comprehensive Shoreland Protection Act (NHCSPA), updated in 2008, regulates land uses in shoreland buffer zones for lakes, tidal waters, designated river segments protected under the NH Rivers Management and Protection Program, and larger rivers that are classified as fourth order and higher. The Mandatory Shoreland Zoning Act of Maine, updated in 2006, carries similar protections for shorelands adjacent to second order and higher streams, tidal waters, and great ponds, and includes protections for freshwater and saltwater wetlands. Maine municipalities must adopt local protections at least as protective as the standards in the Shoreland Zoning Act but may enact more stringent buffer protections at their discretion.

Shorelands adjacent to smaller streams (first, second, and third order) are not regulated under the NHCSPA unless they are designated river segments under the NH Rivers Management and Protection Program. Shorelands adjacent to first-order headwater streams are not regulated under Maine's Mandatory Shoreland Zoning Act. First-order streams can be permanent or intermittent (only flowing for part of the year). While these streams are small, cumulatively they typically make up a large percentage of the total stream miles in a watershed. Protecting buffers along these small streams is equally important as protections for larger streams because pollution from small streams drain directly to larger rivers and ultimately to the estuaries. Small streams have greater soil-to-water ratios compared to larger stream systems: an important factor in nutrient removal and moderation of stream flows, during both high and low conditions.

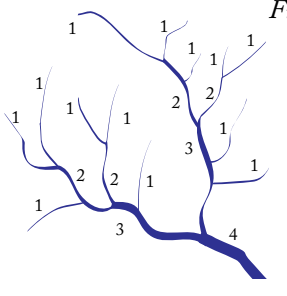

*Figure 3: Stream Order*

*Stream order is a classification system used to define stream size. First order streams are the smallest size and are synonymous with headwater streams.*

Smaller streams with intact, undeveloped floodplains and buffers provide the following functions:

- Maintenance of cool water temperatures
- Wood and leaf debris for invertebrate species and channel formation
- Retention and transformation nutrients to protect water quality
- Connectivity and habitat
- Recharge and discharges zones for groundwater
- Flood storage
- Erosion and sedimentation

Managing riparian and shoreline buffers in the Region requires a broad range of activities, such as:

- Protecting small streams and their buffers
- Identifying and restoring impacted buffers
- Protecting shoreland
- Encouraging more consistency in protective buffer regulations throughout the watershed.

*Studies have shown that if impervious cover is greater than 5% of land area in the watersheds of small streams, it can degrade downstream water and habitat quality from stormwater runoff and associated impacts (USGS, 2007).*