



FIGURE 13: The Four Tiers of a Shoreline Buffer

An effective shoreline buffer should include four tiers, which include a top tier of trees, a lower tier of shrubs, followed by a perennial plant and ground cover tier and a duff layer of decaying leaves, twigs, downed limbs, and decomposing organic matter.

Create or Expand a Shoreline Buffer

Shoreline buffers provide a final defense in blocking pollutants from entering Lake George.

Planting and maintaining a natural shoreline buffer is one of the best management practices a landowner can undertake to protect Lake George. A shoreline buffer, which relies on natural processes to prevent pollution from reaching the lake, provides multiple benefits, and is inexpensive to create and maintain.

A shoreline buffer provides a final defense in blocking unwanted nutrients and pollutants from entering the lake. An effective buffer prevents erosion, absorbs excess nutrients, stabilizes and shades the shoreline, and recharges the groundwater. It also provides wildlife habitat for small animals and helps to deter waterfowl, such as Canada geese, from grazing on lawns accessed from the lake.

Natural shoreline buffers consist of trees, shrubs, woody and herbaceous perennial plants and ground cover, and a duff layer of decomposing organic matter. Figure 13 illustrates four tiers of a shoreline buffer. The trees, shrubs, perennial plants and ground cover, and duff intercept and help prevent nutrients and other pollutants carried in stormwater runoff from reaching the lake. The deep roots within the buffer provide maximum infiltration, as opposed to the shallow roots of a grass lawn that are ineffective at infiltrating stormwater. Soil in a shoreline buffer works remarkably well for filtering pollutants in stormwater and storing excess nutrients for plant uptake.

A Four-Tier Shoreline Buffer Provides Maximum Benefits for the Lake

1. Trees form the upper canopy of a buffer. Trees intercept and soften rainfall during heavy storms by allowing rain to gently trickle from leaves and branches onto the ground. Without an intact canopy, heavy rains cause major stormwater runoff and erosion. Tree roots also grow several feet into the ground, providing maximum uptake of nutrients from the soil.

KEY MESSAGES:

1. A fully functioning shoreline buffer has four tiers:
trees, shrubs, woody and herbaceous perennial plants and ground cover, and duff, which includes a layer of decomposing organic matter.
2. A shoreline buffer significantly reduces impacts from land use by infiltrating and treating storm-water runoff and preventing shoreline erosion.
3. A shoreline buffer is one of the most effective ways to protect water quality.
4. A shoreline buffer is easy to create and maintain.



A full shoreline buffer deters Canada geese from grazing and fouling shoreline areas.

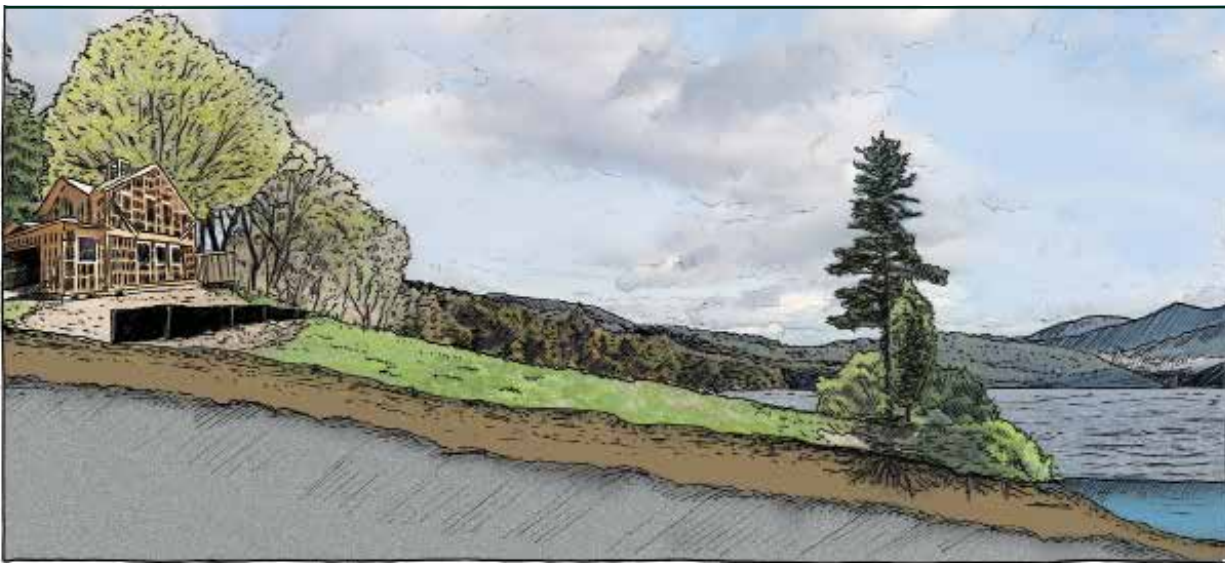
1 73% of stormwater runoff infiltrated by grass lawn and 100-foot wide buffer.



2 58% of stormwater runoff infiltrated by grass lawn and 50-foot wide buffer.



3 32% of stormwater runoff infiltrated by grass lawn and 10-foot wide buffer.



4 18% of stormwater runoff infiltrated by grass lawn.

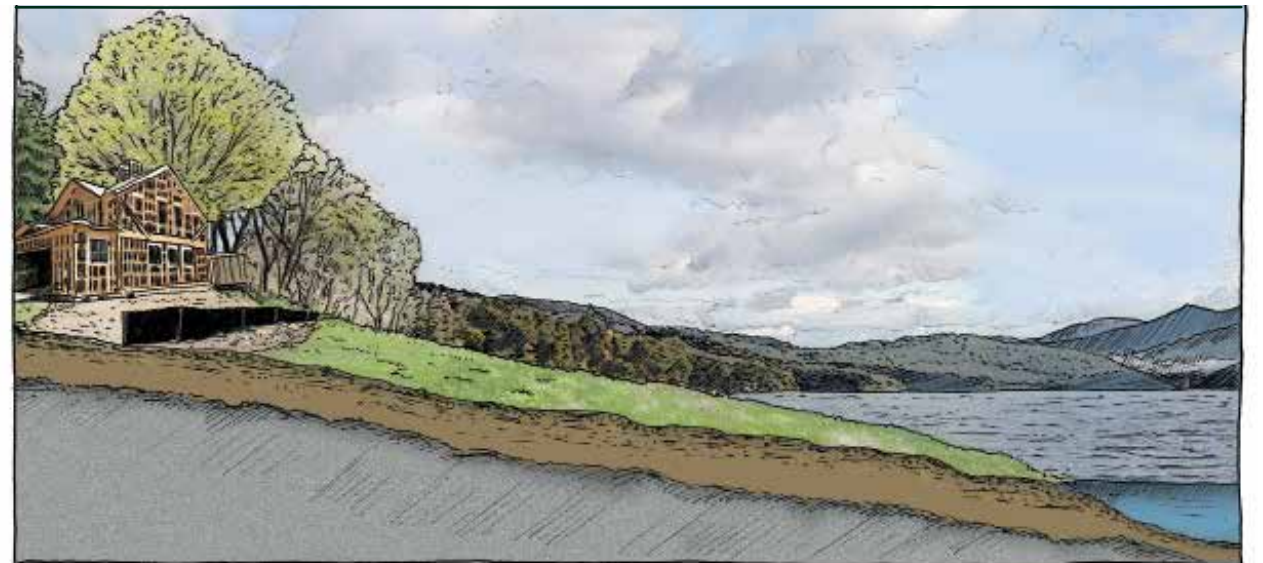


FIGURE 14: Benefits of Increased Shoreline Buffers

Vegetated buffers are extremely effective for managing stormwater and limiting negative impacts to Lake George. The scenarios above show the benefits of wider buffers.

2. Shrubs form the midlevel of a buffer. Shrubs also intercept rainfall and roots hold soil in place and prevent erosion. Shrubs block wind, serve as a refuge for birds and wildlife and reduce noise. Shrub roots absorb many times more water than a grass lawn. Shrub roots can grow into the ground two feet or more, which is much deeper than shallow grass roots that grow just a few inches into the ground.
3. Plants make up part of a buffer's lower level. Woody and herbaceous perennial plants slow down surface water runoff and provide habitat and food for butterflies and other animals. The roots of these plants maintain soil and absorb nutrients and pollutants. They draw up many times more water than a grass lawn. Native plants have flourished in this area for hundreds of years and do not require extra fertilizers or pesticides. For a list of native plant species, please see pages 54–56.
4. The duff layer includes the accumulated and decomposing organic matter on the ground. This organic layer includes rotting leaves, twigs, branches, and decomposing debris that enrich the soil and allow better uptake and absorption. This important layer includes microorganisms that break down and recycle plant material.

A buffer can be any width, but generally the wider the buffer, the greater the benefits to Lake George. Studies have found that wider buffers provide better nutrient intake and sediment control. The composition of the plants within the buffer also influences its effectiveness. Figure 14 illustrates the benefits of increased shoreline buffers.

For some, the drawback to a vegetated shoreline buffer is that it blocks a view of the lake; however, buffers can provide filtered views that accentuate the lake and protect water quality.

Buffers also help control wildlife nuisances, including Canada geese. The sheer number of the birds and their fouling of property often ruins the lakeside experience. Since geese tend to graze in open lawn areas and will not wander through a vegetated area, a shoreline buffer is the best deterrent for keeping them at bay. Forestland and areas with tall growing plants reduce their line of sight and perceived safety.

How to Plant or Expand a Shoreline Buffer

When planting or expanding a shoreline buffer, it's important to mimic natural conditions. Avoid planting vegetation in straight rows or leaving large spaces between plants. It's better to cluster and intersperse trees, shrubs and smaller plants. Shoreline buffers require little ongoing maintenance. The natural duff layer of decaying plant matter, leaves and twigs will build up over time. The duff layer intercepts and infiltrates stormwater runoff and also provide nutrients for the buffer vegetation.

A full four-tier buffer provides greater nutrient removal and storm-water runoff control than a few trees along a mowed lawn or flower gardens without shrubs and trees. An effective buffer is one that re-creates a natural forested area along the shoreline. Paths leading to the shoreline should be curved to further avoid direct funneling of nutrients and pollutants to the lake. Recreational uses of the shoreline, such as docks, boathouses, and beaches, are not impeded by a fully functioning buffer.

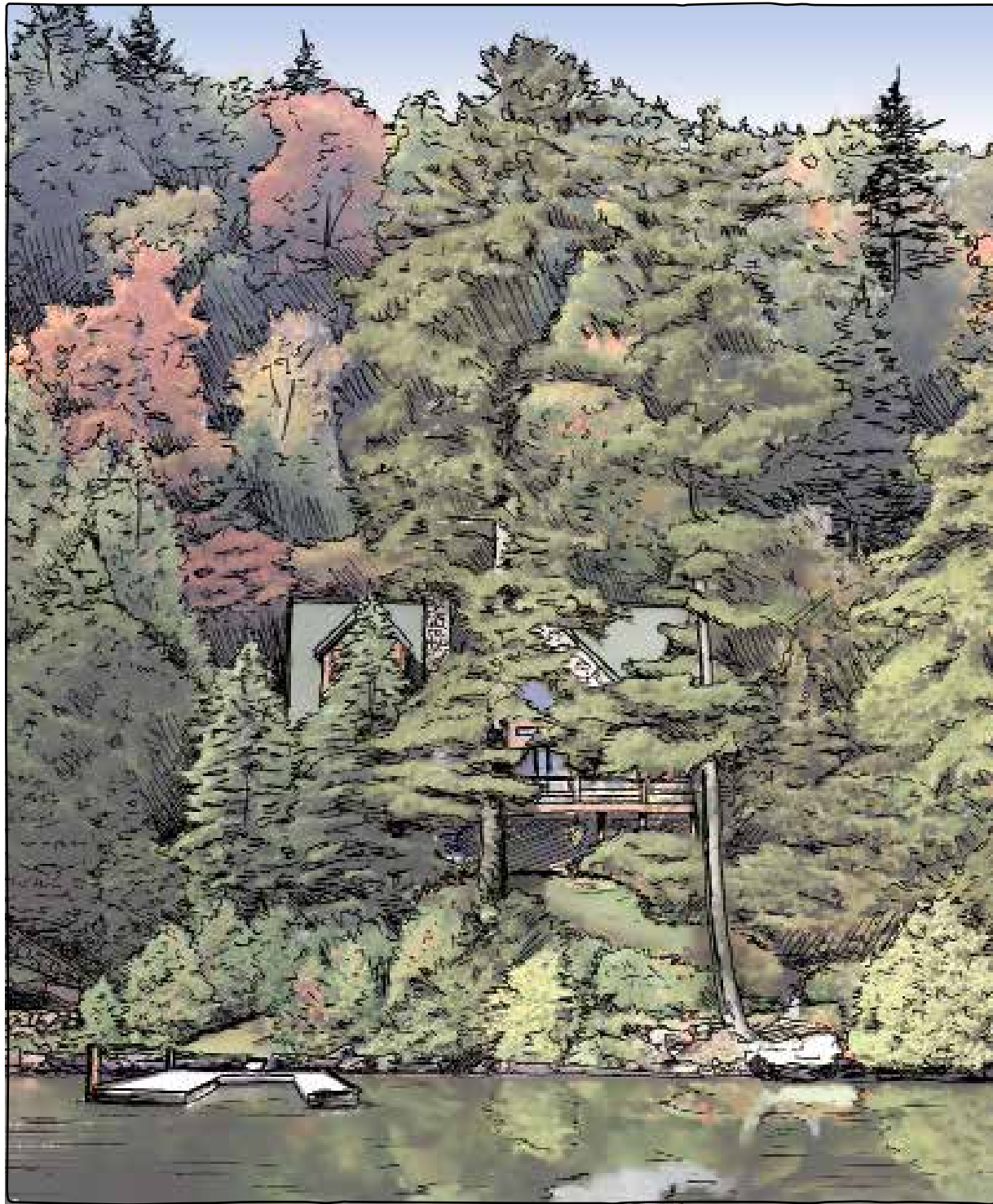


FIGURE 15: A complete shoreline Buffer Helps to Protect the Water Quality of Lake George

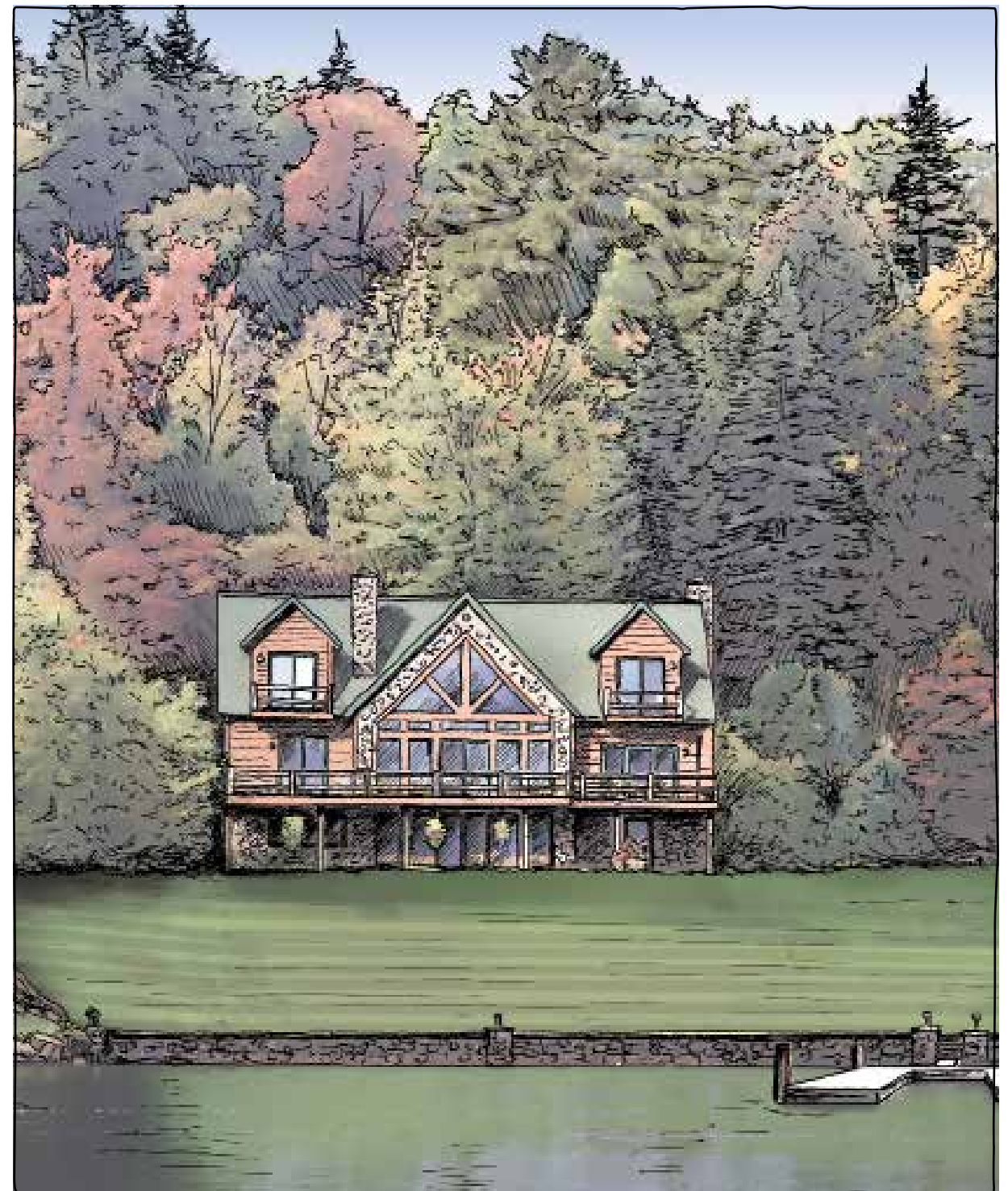
A fully intact shoreline buffer is one of the best management practices for protecting the water quality of Lake George.

FOREST MANAGEMENT

When undertaking commercial forest management on your property, we recommend that you work with a private consulting forester to develop a long-term forest management plan. A forest management plan is the best way to establish the long-term economic, environmental and recreational goals for your property. Though the importance of vegetated buffer areas along streams, wetlands, lakes and ponds is widely recognized as an important part of forest management, the actual buffer widths and management activities undertaken within the buffer area are best determined according to site conditions and in consultation with a forester. Commercial forest management helps to maintain open space throughout the Lake George watershed, support the local forest products industry and protect water quality.



Fully Buffered



UNBuffered

FIGURE 16: A FULLY BUFFERED PROPERTY VS. AN UNBUFFERED PROPERTY

These illustrations show the same property with and without a shoreline buffer. Each property enjoys access to the lake. The fully buffered property helps protect water quality, while the unbuffered property negatively impacts the lake. The unbuffered property generates higher levels of stormwater, which carries nutrients and contaminants to the lake. The large lawn may require heavy use of fertilizers and pesticides. The fully buffered property protects the natural shoreline and may eliminate the need for the construction of a seawall.

Building a shoreline buffer will create a natural looking environment that will protect your property from stormwater runoff, enhance water quality, and reduce time and money spent maintaining that portion of your property. To create or expand a shoreline buffer follow these steps:

A single tree can hold up to 15,000 gallons of water.

An effective buffer prevents erosion, absorbs excess nutrients, stabilizes and shades the shoreline, and recharges the groundwater.

1. Immediately after a heavy rainstorm, tour your property to identify where water flows off your land. Note where the water originates, where it puddles, and where it infiltrates. A buffer should extend a minimum of 25 feet from the shoreline (50 to 100 feet is recommended for water quality protection). The actual width will be dependent on your site's limitations.
2. Identify what amount of lawn is necessary for recreation on your property. Land that is designated to remain lawn should be located as far away from the lake as possible.
3. Define the width and contour of the proposed buffer (the distance from the water) using a garden hose, rope or stakes and ribbons to create an interesting design. Buffers can include paths that provide access to the lake.
4. Buffer plants should include a variety of heights (trees, shrubs and smaller plants) to minimize the impact of heavy rains hitting the soils, as each tier of the vegetative canopy softens the rainfall.
5. Determine the location of your buffer. The selection of native trees, shrubs, woody and herbaceous perennial plants will depend on the site. Selection factors include the soil depth and type (clay or sandy), whether there is sun or shade, and if the conditions are dry or moist.
6. Use of native plants eliminates the need to fertilize or apply pesticides and will naturally attract native wildlife. Nut and berry trees and shrubs attract birds, while logs and rocks provide homes for frogs, toads and beneficial insects. An intact, continuous shoreline buffer will become a wildlife corridor surrounding the lake.
7. Plantings directly on the shoreline will reduce erosion and create a wave break that will reduce the need for seawalls and riprap. Vegetation planted on the shoreline helps to reduce off-shore noise and further deters geese from grazing on your property. Overhanging vegetation provides food and shade for fish and aquatic organisms.



FIGURE 17: Enjoy a Filtered view of the lake

A great filtered view can be provided by creating small openings in the buffer.

8. A buffer should be maintained in its natural state. Dead and decomposing leaves, twigs and natural debris should be left on-site, as this organic matter protects the soil from heavy rainfall and spatter and absorbs water.

Many residences around Lake George have fully functional shoreline buffers of 25, 30 and 50 feet or more in width. Property owners are able to mitigate the impacts of land use and preserve the water quality of Lake George by creating and maintaining shoreline buffers. 💧