THE BENEFITS OF TREES AND FORESTS

We all have an inherent understanding that our lives are better because of forests. People heal faster when they can see trees out the hospital window. People willingly pay much more for a home with mature trees. Forests are called the “lungs of the earth”, and work against climate change. There is a purifying and moderating role for trees and forests related to water that is more important now than ever.

These benefits are so familiar that they are often not listed, but here are just some of the many benefits.

Benefits

✓ Reduce flooding and low flow events by intercepting runoff and encouraging infiltration
✓ Improve water quality by slowing the rate at which rainfall runoff flows to rivers and streams and trapping, using, or breaking down some of the pollutants and nutrients that are harmful to water quality
✓ Improve water quality by lowering water temperatures with shade over streams
✓ Provide fallen leaves to feed soil and aquatic organisms
✓ Improve groundwater quality by increasing the amount of rainfall runoff that percolates into the soil and replenishes our main source of drinking water, and by breaking down or capturing toxins
✓ Improve air quality, especially in the summer when air quality is often compromised, by lowering temperatures, filtering dust, and absorbing ozone, carbon monoxide, sulphur dioxide, nitrogen oxides, airborne ammonia, and heavy metals, and by releasing oxygen
✓ Help counteract the greenhouse effect and global climate change by taking carbon out of the atmosphere and storing it in the form of wood, and by reducing winter heating and summer cooling energy demands
✓ Reduce erosion and help the soil recuperate where trees are planted
✓ Reduce summer temperature extremes and air conditioning costs by providing shade and the cooling effects of evapotranspiration, particularly in the cities
✓ Reduce winter discomfort, energy loss and heating bills, and snow movement with windbreaks
✓ Increase crop and livestock productivity and soil sustainability by sheltering fields with windbreaks
✓ Diversify the rural economy by providing income (or savings) from harvesting forest products such as firewood, fence posts, maple syrup, pulpwood, and lumber (over 5,000 products are derived from trees)
✓ Provide homes for wildlife
✓ Preserve and increase the diversity of plants and animals (biodiversity) which in turn improves the overall health of the community ecosystem
✓ Link natural areas together with plantings to provide travelways for wildlife
✓ Increase the beauty of the environment in our community
✓ Encourage healthy open-air activities
✓ Provide “living laboratories and outdoor classrooms”
✓ Reduce glare
✓ Filter out harmful UV rays
✓ Provide a calming environment by absorbing noise and improving aesthetics, resulting in less stress, less crime, and “traffic calming”
✓ Provide food, medicinal ingredients, herbs
✓ Provide an opportunity for healthy community action and involvement
✓ Increase property values
✓ Provide a “sense of place”
✓ Contribute to a quality of life that makes the area a desirable place to live and to establish enterprises
✓ Provide spiritual and creative inspiration
✓ Accentuate the seasons

With so many benefits, trees are one of the best investments a community can make: one study showed that for every dollar spent on trees, the community saw a return on investment of three dollars worth of benefits.
The list above offers the generic benefits of trees. Following is more watershed-specific details about the benefits of the watershed forest, and where gains could be made.

**Water quality**

A combination of factors has improved water quality in the Grand’s rivers and streams over the past three decades. Two of them are directly related to forestry:

- increased application of agricultural and agroforestry Best Management Practices (e.g., windbreaks, stream buffers);
- improved waste water treatment;
- improved storm water management; and
- increased forest cover

Forest cover has increased on the moraines, and this is precisely where forestry cover can dramatically increase (up to tenfold) the rate of groundwater recharge.

**Hydrology and stream flow**

Drastic deforestation during the European settlement era is one reason that river flow became more exaggerated. Stream flow is more moderate in forested areas than it is in agricultural or urban areas of similar topography and soils. Forest soils are more absorbent than agricultural soils because of higher organic matter content, and tree trunks, branches and leaves intercept as much as half of the precipitation falling on mature forest.

Infiltration of precipitation into the ground is increased because the ground surface is less regular and because the soil is looser and more fractured. Evapotranspiration rates are higher for forests than other vegetation cover types; and both snow accumulation and snowmelt delay are higher in forests than in fields or cities. On balance, as a result of all
these effects of forests on the hydrology cycle, both floods and ‘low flow’ events become less extreme and frequent as percent forest cover increases.

Flooding and low flows resulting from deforestation became evident in the Grand valley soon after European settlement had covered the watershed. Two solutions have been pursued since then: dams/reservoirs and reforestation. Some areas of the watershed have increased in forest cover, but much opportunity still exists, especially in the north and northwest parts of the watershed, to improve streamflow with additional forest cover.

**Soil Quality**

Soil quality has been improved through the application of agricultural and agroforestry Best Management Practices. Especially important in this regard are windbreaks, conservation tillage, and retirement and subsequent reforestation of seriously eroding farmland. Unfortunately, the windbreak establishment movement of the last two decades has not been as successful as the hedgerow removal trend of the 1960’s and 1970’s; that is, there is still much opportunity to establish windbreaks and to restore hedgerows.

**Biological productivity**

The Carolinian and Great Lakes - St. Lawrence forest regions that the Grand River watershed are within, are some of the most diverse and productive in Canada. In the Carolinian zone, the relatively long growing season and the mixing of major forest types leads to a great deal of biological productivity. Despite this relatively high productivity, the potential is even higher. The productivity could be improved by creating bigger blocks of forest.

The conversion of conifer plantations to hardwood could be done more quickly with concerted effort. Diverse plantings are becoming the norm, and this may ‘jump start’ the process, but there is a backlog of fairly homogenous conifer plantations, which, depending on objectives, could be diversified through thinning and underplanting and/or seeding of hardwoods such as ash, oak, and maple.

**Economic and Social Benefits**

**Extraction of forest products**

A very small percentage of forests in the watershed are professionally managed. Many others are being managed in an ethical fashion, but could yield more of the desired product or amenities by greater application of scientific management techniques. The local forests are capable of yielding, on a sustainable basis, far greater volumes and higher quality of products. Local lumber and veneer mills import logs from the United States that could be grown here.

The general economic argument in favour of forest products may be persuasive, but a more far-reaching issue is in the value that landowners place on their natural areas. If all natural areas are considered a financial burden to landowners who need to make a living from the land, then maintaining these elements of the landscape may become more difficult. If, however, landowners come to think of natural areas as an integrated part of
their revenue-generating system, then perhaps more people will be interested in having and maintaining natural areas.

**Social and Recreational Benefits**

Demand for forest-based recreation exceeds the capacity of public open space to satisfy the need sustainably. Popular forest trails of the Grand River watershed, such as at Elora Gorge Conservation Area, Rockwood Conservation Area and others, are being used so heavily that the forest is suffering. One bright spot in this regard is the advent of the Rails to Trails program, which provides walking and cycling trails on abandoned rail lines. Recreational opportunities are being sought by urbanites on private rural land, sometimes creating conflict. This is an area of challenge and opportunity.