Water Quality, Soil Conservation, Soil Function, Air Quality

Native vegetation improves water quality.

Reduced soil erosion – Native vegetation possesses significantly greater root mass than non-native grasses, providing reinforcing structure to hold soil in place. The above ground biomass of native grasses intercepts and dissipates the energy of falling rain. Native grasses hold from 50% to 97% of the rain that falls, keeping it from impacting the soil. Accumulated leaf and stem material protects the surface as well.

Increased nutrient/sediment retention – Native grasses trap up to 50% of coarse sediments, many of which are nutrient and pesticide laden. In studies, switchgrass removed significantly more N and P that cool-season filter strips. Native grasses are known to facilitate microbial breakdown of organic matter, pesticides and heavy metals.

Reduced water flow velocity and runoff – Accumulated residual leaf and stem material on the ground surface retards runoff, slowing flow functioning the same as miniature runoff retention ponds. Tall, stiff-stemmed native grasses are resistant to flow and slow water velocity and maintain their effectiveness as filters longer than short, sod-forming grasses.

Native vegetation promotes soil conservation.

Reducing soil erosion – The extensive root mass, rainfall interception and leaf/stem material at the ground surface protect the soil from erosion.

Increased soil organic carbon – Native perennial plants eliminate cultivation which depletes soil organic carbon. As much as 70% of native grasses root systems die and regenerate annually, increasing soil organic carbon and native vegetation sequesters carbon from the atmosphere and stores it as organic matter in the soil.

Native vegetation improves air quality.

Carbon sequestration – Native vegetation sequesters more carbon than introduced grasses. Due to the annual death and regeneration of parts of the extensive root system, more than 95% of the carbon in native grasses is below the ground in soil organic matter.
Native vegetation improves soil function.

Increased infiltration rate – Increased soil organic matter and macropore space in native vegetation increases the infiltration rate. Accumulated leaf and stem material at ground level retard runoff, allowing more time for infiltration.

Increased water-holding capacity – The increased soil organic matter in native vegetation acts like a sponge and increases the water holding capacity. Micropore space created by decaying fine root structure and mycorrhizae create capillary action in the soil which increases water holding capacity.

Increased soil fertility – Decay of fine root masses increase soil organic matter and deep roots access nutrients otherwise inaccessible by shallower rooted plants.

Reduce soil compaction – Deep roots reduce soil compaction.

References