Appendix 3

PDS 4-2024

Ecosystem Services

Ecosystem Services Analysis

Carbon Storage and Sequestration

Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide. Trees act as natural carbon stores by capturing carbon dioxide and storing it in their biomass and in the soil as organic carbon compounds. The region's TFC carbon storage and gross sequestration rates are estimated as follows:

- Carbon Storage: 4,265.2 metric kilotons
- CO2 Equivalent: 15,639.2 metric kilotons
- Gross Carbon sequestration: 90.2 metric kilotons/yr
- CO2 Equivalent: 330.9 metric kilotons/yr

The overall valuation of the carbon storage and sequestration ecosystem services from TFC is estimated to be $489.9 million + $10.4 million/yr. These valuation estimates are based on carbon pricing of $114.87/metric ton.

Air Quality

TFC absorbs carbon dioxide, volatile organic compounds, nitrogen dioxide, and particulate matter, therefore improving air quality. The region's TFC is estimated to remove 2,757.7 metric tons/yr of pollution:

- CO: 15.15 metric tons/yr Carbon Monoxide
- NO2: 257.91 metric tons/yr Nitrogen Dioxide
- O3: 1,933.98 metric tons/yr Ozone
- PM2.5: 107.36 metric tons/yr Particulate matter less than 2.5 microns in size
- SO2: 443.31 metric tons/yr Sulphur Dioxide

Hydrology

Surface runoff from storm events is often amplified in urban areas where impervious surfaces are prevalent. Runoff can gather surface pollutants which can end up deposited in surrounding aquatic ecosystems. TFC has the ability to intercept varying degrees of rainfall. Run off avoidance also contributes to substantial cost reductions to stormwater management controls. The total avoided surface runoff from Niagara Region's TFC is estimated to be 598,000 m3/yr.

Oxygen Production

The amount of oxygen produced is directly related to the amount of carbon sequestered by trees. The region's TFC is estimated to produce 240.6 metric kilotons/yr of oxygen.