

Natural Infrastructure Terms and Concepts

Assets

Fully Natural	Built / Engineered
<ul style="list-style-type: none"> • Rivers • Streams • Creeks • Wetlands • Lakes • Ponds • Riparian areas • Wet soils • Native vegetation • Tree canopy • Permeable soils • Vegetated channels • Natural permeable surfaces • River and stream meanders 	<ul style="list-style-type: none"> • Constructed wetlands • Stormwater ponds • Natural vegetation • Green roofs • Open curbs • Planted medians • Vegetated swales • Infiltration planters • Infiltration galleries • Flow through planters • Rain gardens • Pervious pavements • Cisterns and rain barrels

Benefitting from Natural Infrastructure

Asset	Function	Service	Action
<i>The 'thing'</i>	<i>This happens whether we are there or not</i>	<i>The benefit to us</i>	<i>What we should do to get the benefit from the asset</i>
E.g., Wetland	E.g., Stormwater capture	E.g., Decrease in flood damage	E.g., Retain wetlands

Natural Infrastructure Functions and Services

Functions	Description	Associated Service
Storm/rain water capture	Can gather excess water in flood events, and store water in periods of drought	Reduces impact of flood events on people and property, reduces strain on reservoirs, increases availability of potable water
Slow release of accumulated water	Provides slow release of stored water such that it does not run off before it can provide value	Increases available potable water, maintains valued vegetation, reduces floodwater storage need
Moisture retention	Resists general drying trends to ensure vegetation stays moist even as ambient temperatures rise	Maintains soil moisture during times of high temperature or water scarcity, reducing fire risk and maintaining vegetation.

Functions	Description	Associated Service
Water infiltration into soil	Allows flows of water from the surface into the subsurface	Decreases changes of pluvial/fluviol flooding by providing dispersed dissipation mechanism, maintains soil moisture and groundwater during times of water scarcity
Storm/rain water conveyance	Prevents accumulation of water by providing drainage channels for storm/rain water	Reduces property and infrastructure damage due to accumulating stormwater, reduces need for temporary water storage facilities
Groundwater recharge	Provides egress for rain / surface water to pass into underground aquifers / reservoirs	Provides sustained access to groundwater, increases effective access to water in periods of water scarcity
Water flow calming	Slows the rate or volume of water flow	Reduces severity of infrastructure damage due to moving water, reduces erosion

Making the Case for Natural Infrastructure

At some point you will be called on to make the case for Actions related to your natural infrastructure. Two things to consider: an actual cost-benefit comparison, and community benefits/co-benefits.

Approaches commonly used for natural infrastructure assets are: TEV – Total Economic Value; and NPV – Net Present Value. Don't undertake these unless you have to as they are expensive and examples exist that you can draw from, instead of undertaking these approaches. See 'Case Examples' below.

Case Examples

Naturally occurring ponds in Gibsons, BC provide \$3.5 million to \$4 million of stormwater storage services annually;

A 250-metre naturalized channel in the town of Oakville, Ontario provides \$1.24 million to \$1.44 million of stormwater conveyance and storage annually;

Naturally occurring wetlands in southern Ontario reduce flood damage costs to buildings by \$3.5 million (or 29%) at a rural pilot site and by \$51.1 million (or 38%) at an urban pilot site; and

A restored and engineered wetland in Manitoba was valued at \$3.7 million for the flood reduction, water quality improvement, carbon sequestration and other benefits it provides.