## Natural Infrastructure Terms and Concepts

### Assets

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| **Fully Natural** | **Built / Engineered** |
| * 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 | * 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

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| **Asset** | **Function** | **Service** | **Action** |
| *The 'thing'* | *This happens whether we are there or not* | *The benefit  to us* | *What we should do to get the benefit from the asset* |
| 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** |
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| 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 if 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. |
| Water infiltration into soil | Allows flows of water from the surface into the subsurface | Decreases changes of pluvial/fluvial 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

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| 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. |