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Credit Valley Conservation inspired by nature

PLANTING FOR SUCCESS!

School Rain Garden Design

INTRODUCTION TO THE STUDENTS FOR STORMWATER PROJECT

Credit Valley Conservation
inspired by nature

INTO THE WOODS
LANDSCAPE ARCHITECTURE & ARBORICULTURE LTD.

A garden suggests there might be a place where we can meet nature halfway

Michael Pollan

Forest, Wetland, Meadow

I believe you can design a rain garden almost anywhere there is runoff.

After all, green infrastructure at its simplest is just mimicking natural environments to restore natural ecological function.

BELFOUNTAIN

- TINY FOREST
- LOG FLUMES

Janet I. MacDougald

- SWALE (WET MEADOW)

MINEOLA

- SWALE (WET MEADOW)
- WILLOW HOUSE AND TUNNEL

OUR LADY OF FATIMA

- SWALE (WET MEADOW)
- FERN GULLY

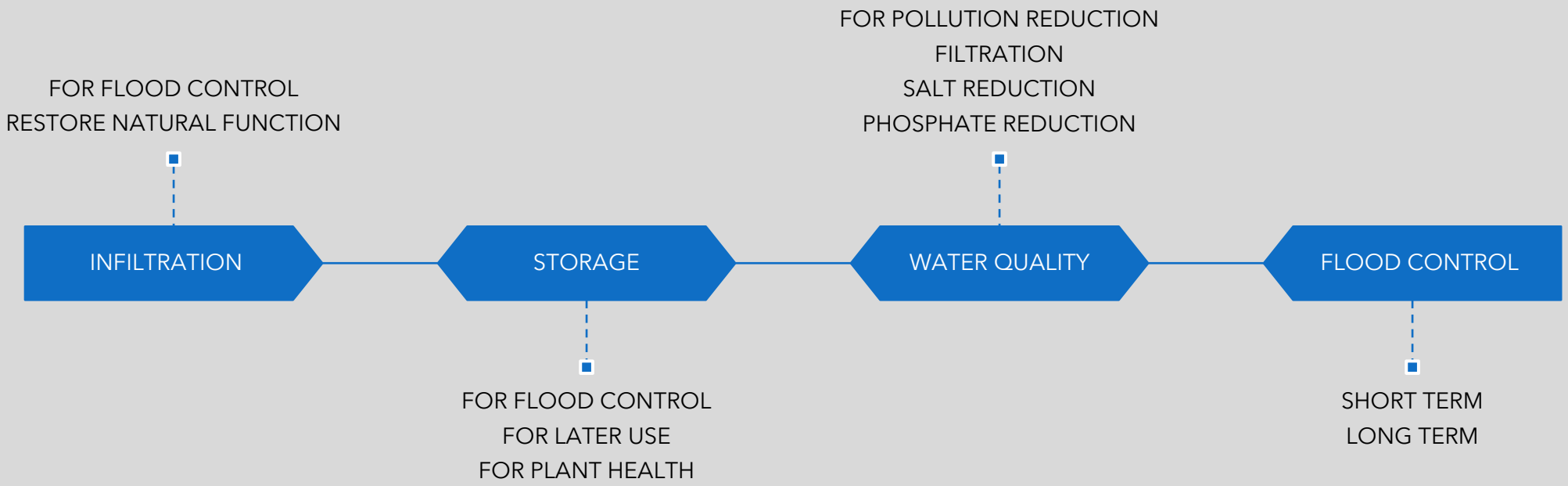
WHITEHORN

- SWALE (WET MEADOW)
- WILLOW HOUSE
- PERMEABLE PAVERS

CREDIT VALLEY

- TIERED WET MEADOWS

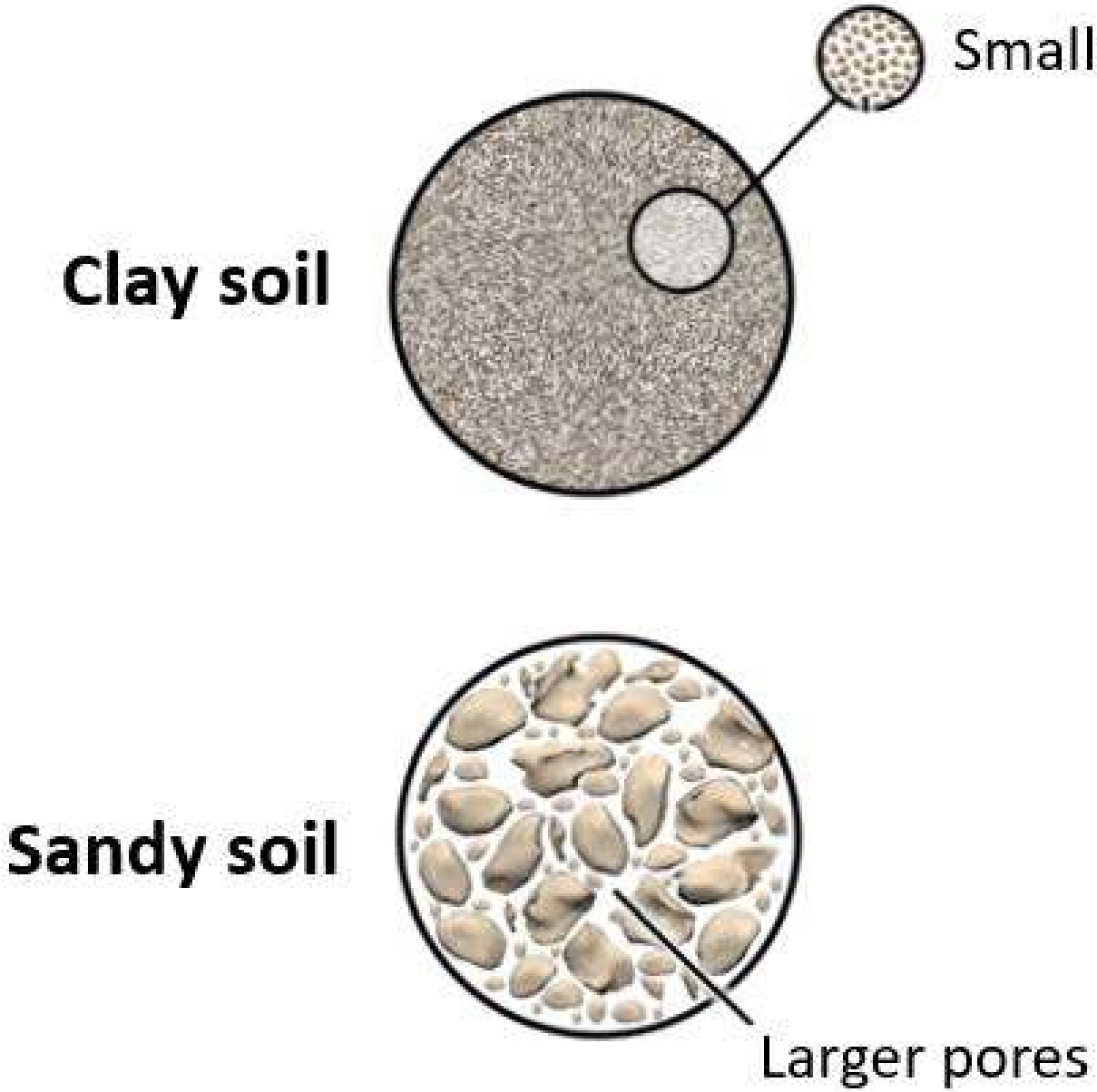
STORMWATER RAIN GARDEN GOALS



Site Analysis is key to determining what the Rain Garden's Goals should be.

- Grading
- **SOILS**
- **INFILTRATION RATE**
- Exposure etc.
- Social Considerations
- Physical Constraints
- Safety
- Tree Preservation

Credit Valley Public School



WATER HOLDING CAPACITY

When Rain Gardens and LID features were first implemented, very SANDY soils were specified, because of their high infiltration rate.

However, the downside of this is their low water holding capacity.

Likewise, lower retention of other particles (pollution reduction)

SANDY SOIL

- WILL PROVIDE RAPID FLOOD REDUCTION, AT THE RATE OF STORAGE CAPACITY AND UNDERDRAIN
- LIMITED WATER QUALITY BENEFITS WITHOUT ADDED TECHNOLOGIES
- LOW WATER HOLDING CAPACITY IMPLICATIONS:
  - NEED TO LIMIT PLANT SELECTION TO DROUGHT TOLERANT PLANTS THAT CAN GO DORMANT IN SUMMER.

COMPLEX SOIL

- WILL STILL PROVIDE FLOOD REDUCTION AT A REDUCED RATE.
- ADDITIONAL OPPORTUNITIES FOR WATER QUALITY BENEFITS.
- GREATER WATER HOLDING CAPACITY AFTER INITIAL FLOOD
- GREATER PLANT SELECTION CHOICES AND DIVERSITY

Soil Specifications for Rain Gardens

- Try to use the native soil and amend it where you can
- I am a big fan of adding Compost.
  - Makes soil less dense, so that they act more like a sponge.
- Depending what your original Goals are, you may need to replace soil in parts of garden
  - Wet meadow mix
  - Sandy media
- Add mulch- shredded bark mulch

Amendments:

- Can add Sand to native soil
- New Topsoil should be unscreened
- Usually targeting a sandy loam.
- Organic materials-
  - Composted leaf litter
  - Composted animal manures
  - Avoid peat

  - Flexibility in Design – Mimicking Natural Systems, there is great variation in natural systems, and it depends on the goals of your design.

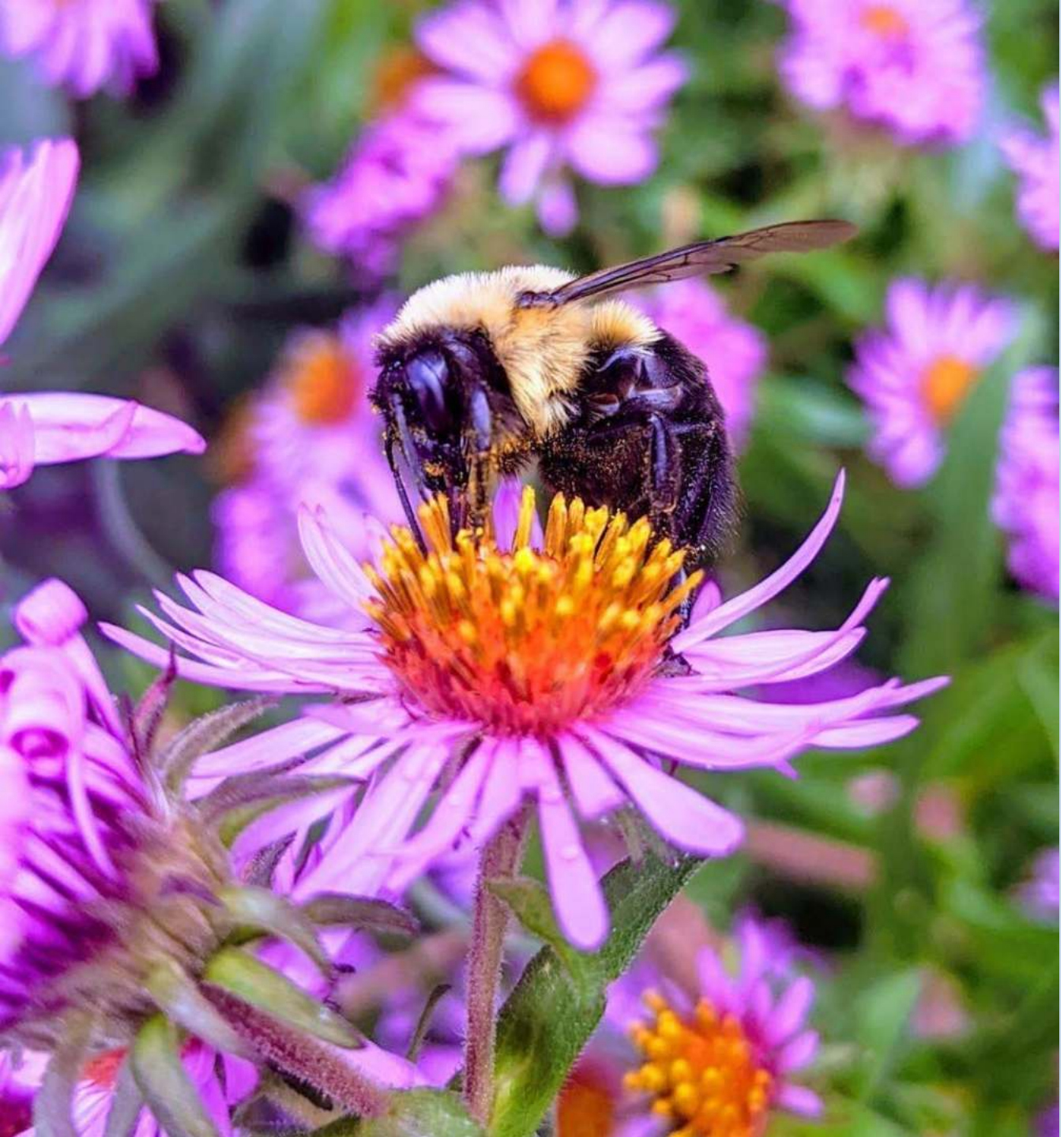
WATER

- Need to be aware of what the water conditions will be on the site throughout the year
  - Will soils dry out in the summer?
  - What is the level of saturation?
  - How long will ponding occur?
  - Do you need an underdrain?
  - Will salt/ snow removal occur adjacent to the garden?

Garden	Soil Type	Infiltration Rate (Test)	Design Soil	Underdrain
Belfountain	Sandy loam	70 mm/hr	Compost, Mulch	No. Overflow lawn
Janet I. MacDougald	Sandy loam	34 mm/hr	Compost, Mulch	No. Overflow catchbasin
Mineola	Loam/ Silt Loam	82 mm/hr	Compost, Mulch	No. Overflow lawn
Our Lady Fatima	Silty Clay	10.5 mm/hr	Compost, Mulch	No. Overflow catchbasin
Whitehorn	Clay- with variation	1 mm/hr	Compost, Mulch, Wet Meadow Mix	Yes.
Credit Valley	Silty Clay Loam	12mm/hr	Compost, Mulch, Wet Meadow Mix	No. Overflow catchbasin

Naturalized Planting Design

- Mimicking Natural Systems provides the lowest maintenance requirements
- Preference for Native Plants, Near Natives or NATIVARS.



NATIVE PLANTS

- Beneficial Relationship with each other
- Attracts Pollinators
- Food Source for native wildlife
- Educational Tool
- Opportunity to introduce urban dwellers to their natural environment

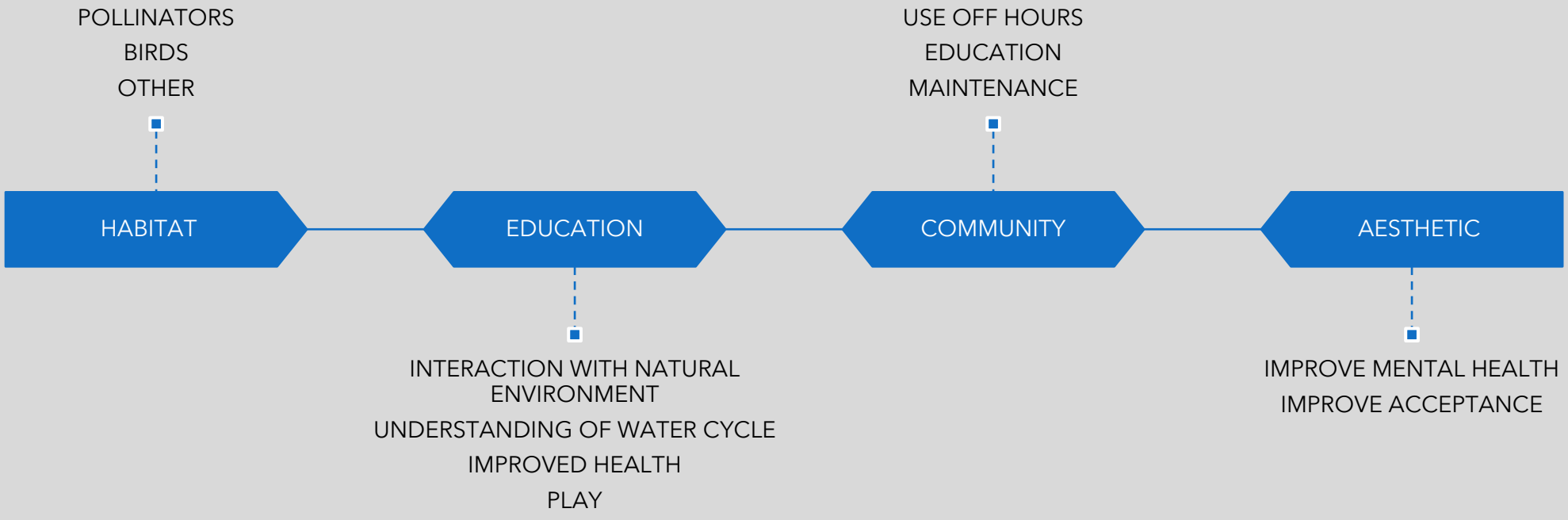
Plant Composition

- Must Select Plants to match soil/moisture conditions
- Seasonally flooded, and can tolerate some drought
- Diversity of species
- Mimic Natural Environments
- Mimic natural relationships
    - Mass Planting vs. Randomized

Planting Design

- Pleasing aesthetic combinations
- Seasonal Interest and continuous habitat
- Try to use shrubs and trees where I can
- Established plants over seeding
- Good idea to use a combination of flowering perennials and grasses
    - BIOMASS ACCUMULATION

SOCIAL RAIN GARDEN GOALS



Accessibility

Education

- Programming (Common elements)

- Play
- Form follows Function
- Interactive

Lessons Learned

- Avoiding Compaction with Rain Garden Soils
  - Wet Soil- Organic Matter
  - Grading Garden methods
- It's a good idea to plan for some surface storage
- Importance of Maintenance during the establishment Period (3-5 years)
- Direct Contractor Oversight

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