



Reducing Stormwater With Trees & Native Plants

City of Franklin
Storm Water Education Program

Benefits of Trees:

Environmental Benefits

- Reduction in air temperature by blocking sunlight, water evaporating from leaf surface removes heat energy from the air.
- Shade reduces surface heat – a natural air conditioner.
- Evergreen trees can reduce wind speeds – reduce heat loss from a home.
- Trees absorb and block noise and reduce glare.
- Trees help settle out, trap dust, pollen and smoke in the air.
- Trees absorb carbon dioxide and potentially harmful gasses (sulfur dioxide , carbon monoxide).
- Fallen (decaying) leaves provide nutrients, reduce soil temperature and soil moisture loss.
- Trees create an ecosystem – providing habitat and food for birds and animals.
- Tree canopy reduce water temperature in streams, ponds to enhance aquatic life and improve water quality.



Benefits of Trees:

Community Benefits

- Trees can enhance community economic stability – residents, new business, tourists, etc.
- Higher property values for landscaped home - higher occupancy rate for apartments or offices with wooded areas.
- Improves air quality, increases ground water recharge reducing soil erosion and stormwater run-off.
- Trees make communities more livable for people and their activities.
 - ❖ People walk and jog more on streets with trees.
 - ❖ Children and adults have cool places to relax and play.
 - ❖ Feeling of community pride created by trees can help reduce crime.



Benefits of Trees:

- Trees clean the air – provide oxygen.
- Trees cool streets and the city – conserve energy.
- Trees save water, prevent soil erosion and help prevent water pollution.
- Can provide food, wood, canopy and habitat for wildlife and reduce water temperature in streams and waterbodies.
- Provide shade, block ultra-violet rays, reduce energy needs.
- Trees increase property values, blocking unsightly views.
- Trees create economic opportunities and increase business traffic.
- Increase the community's quality of life, reduce violence.



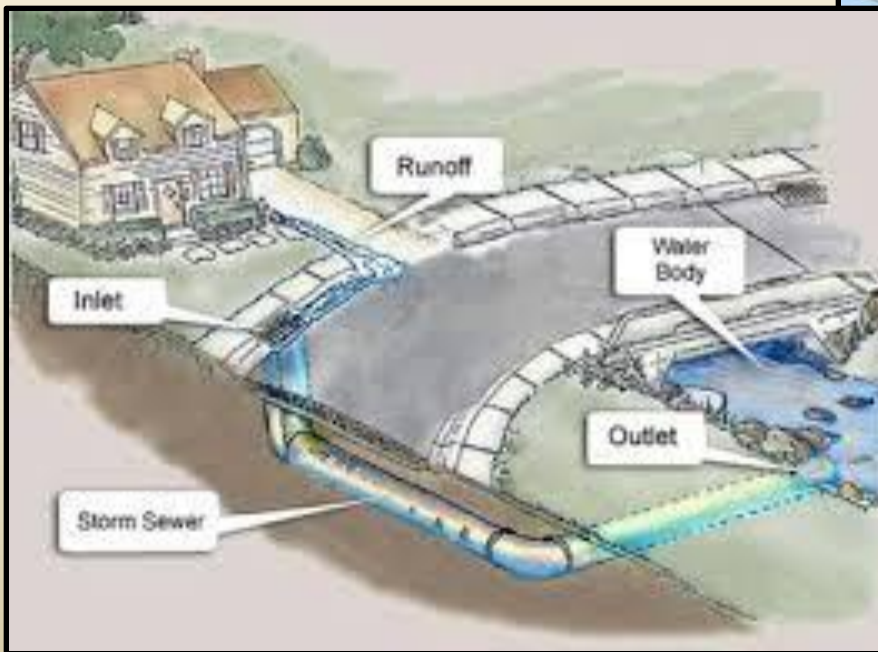
Stormwater Management:

How can we harness the power of a forest in the city?



Challenges for Urban Settings:

- Impermeable surfaces
 - Decreased infiltration
 - Increased runoff
- Compacted soils
- Lack of space



Stormwater Challenge - Paved Surfaces:

- No ground water recharge
 - Cannot store water
 - Inhospitable to plant life



Pollution laden runoff



Infiltration BMPs:

Typical infiltration BMPs concentrate stormwater into a small area, which can potentially increase the risk of groundwater contamination if treatment options are not considered.

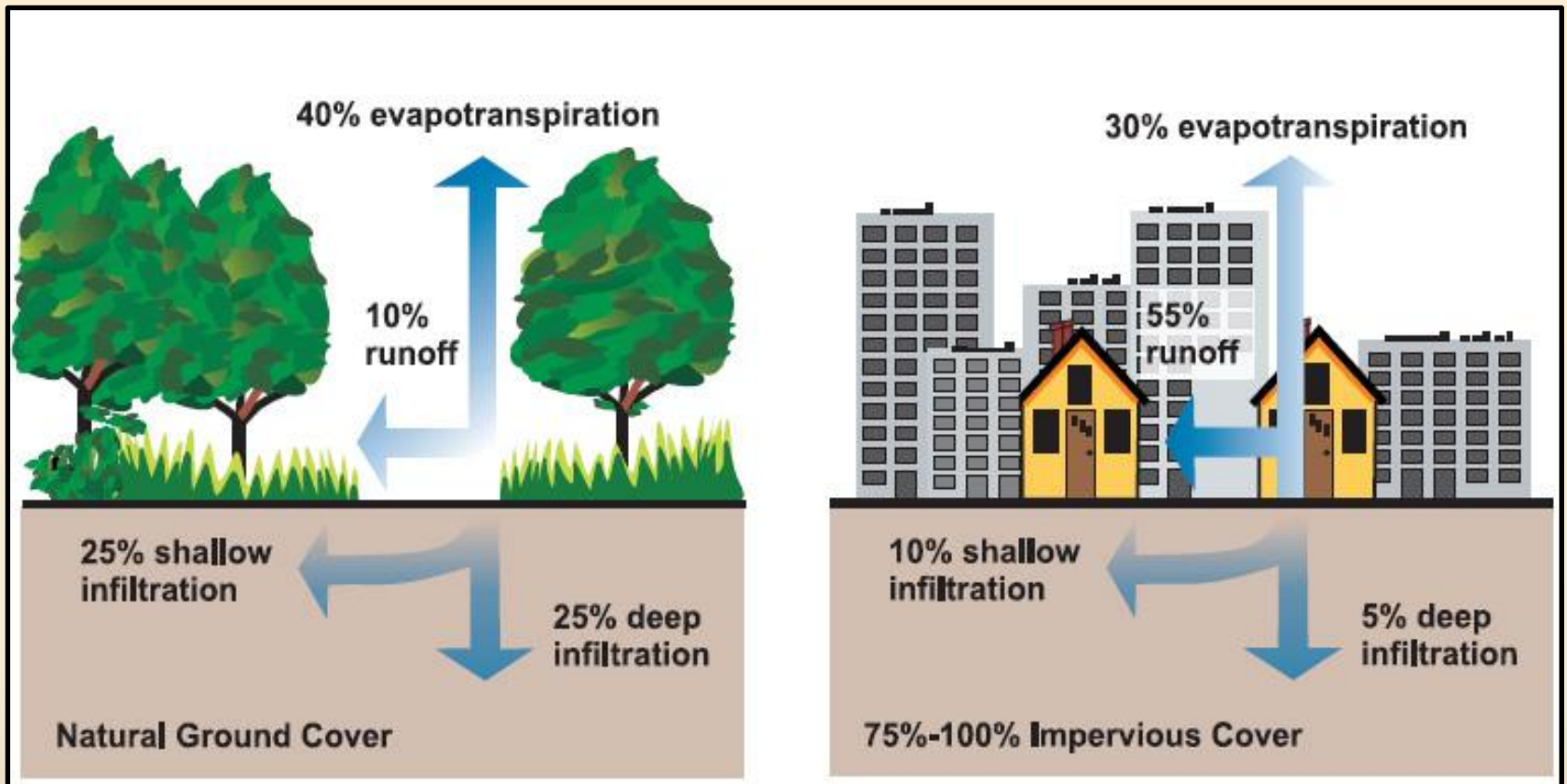


Common Stormwater Practices:



- **Detention Ponds**
 - Take up open space
 - Lack distributed infiltration
 - Issues with safety, pests and aesthetics

The Role of Trees:



We cannot mimic pre-development hydrologic cycles *without* plants.

Now! - How can we do it? Stormwater Management!

- The use of specific practices, (constructed or natural), to reduce, temporarily detain, slow down and/or remove pollutants from stormwater runoff.



- Essentially designed to restore or mimic some of the natural processes provided by the vegetative cover that existed prior to land disturbance. In many regions of the country, this native vegetative cover includes trees and shrubs.



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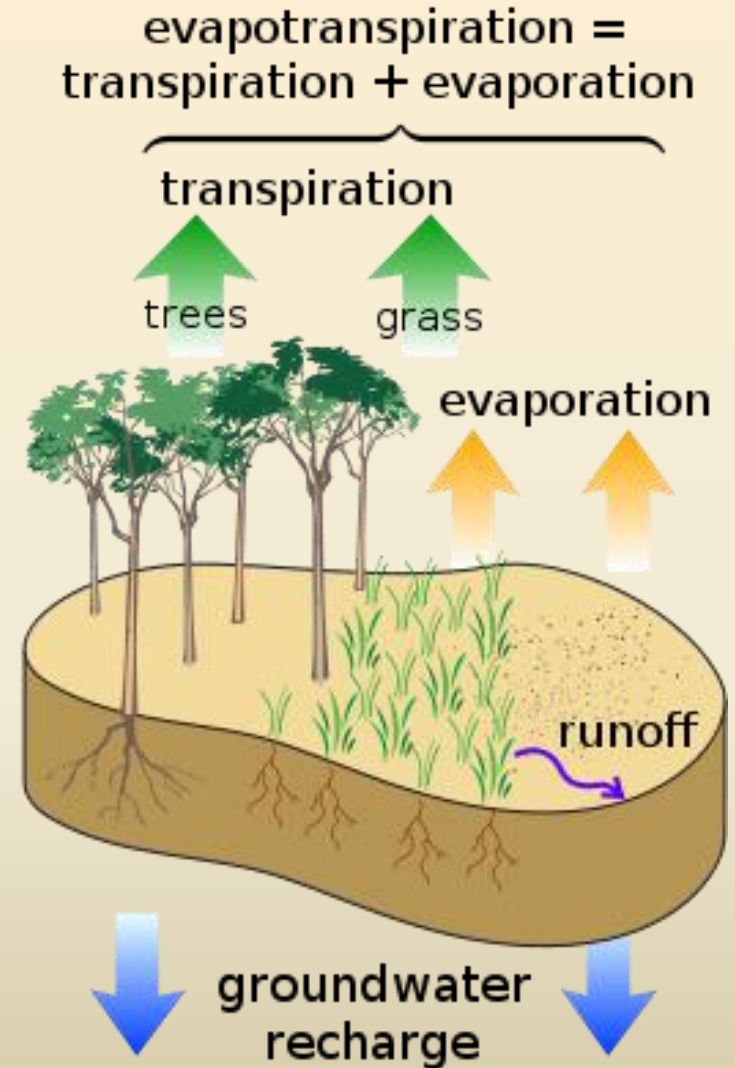
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Evapotranspiration:



- Trees intercept and store water with their canopies, direct water to the soil with their trunks and roots to transpire water back to the atmosphere.



How much rain can a tree retain?

One mature tree reduces stormwater runoff by over 1,000 gallons per year.

Trees manage stormwater runoff. They help reduce pollution and make waterways healthy for people and fish.

Trees are the "new" technology to retain water on site, to slow the flow to our waterways.

Trees in your yard and your community protect water and soil resources. Trees reduce the amount of runoff and pollutants in creeks, ponds and other receiving waters in three primary ways:

- surfaces of leaves, branches, and trunks intercept and store rainfall, thereby reducing the amount of runoff, soil erosion, and delaying the onset of peak flows;
- root growth and decomposition of organic matter increase the capacity and rate of infiltration of rainfall into the soil and reduce surface flow;
- the tree's system recycles rainfall back into the atmosphere as evaporation.

Incorporate Trees into Stormwater Management on Your Property

- 1 Increase the tree canopy on your property by planting large trees with full crowns and broader leaves, such as maple, oak, and beech.
- 2 Plant needle-leaf and broad leaf evergreens on the north side for wind shields and for winter rainfall interception; avoid planting evergreens in front of south-facing windows to maximize winter solar heat gain.
- 3 Encourage your community to plant more trees in appropriate areas such as parkways, boulevards, parking lots, traffic islands, swales, median strips, and "rain gardens." This will aid the retention/detention and infiltration/filtration processes.
- 4 With new tree plantings, extend a thin layer of organic mulch to the drip line to improve your tree's ability to absorb rainfall.



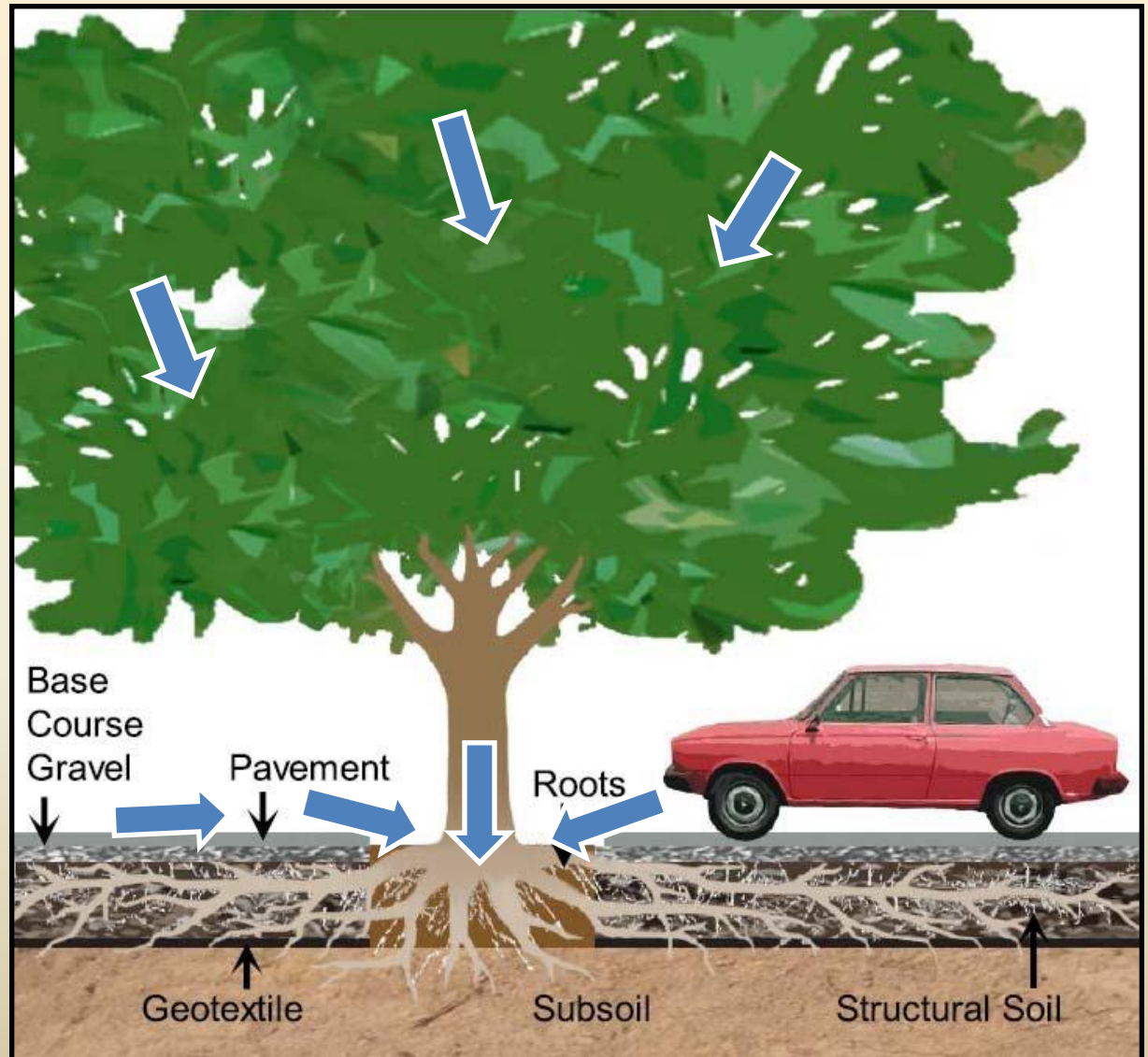
More trees
= equals =
lower costs
for stormwater control



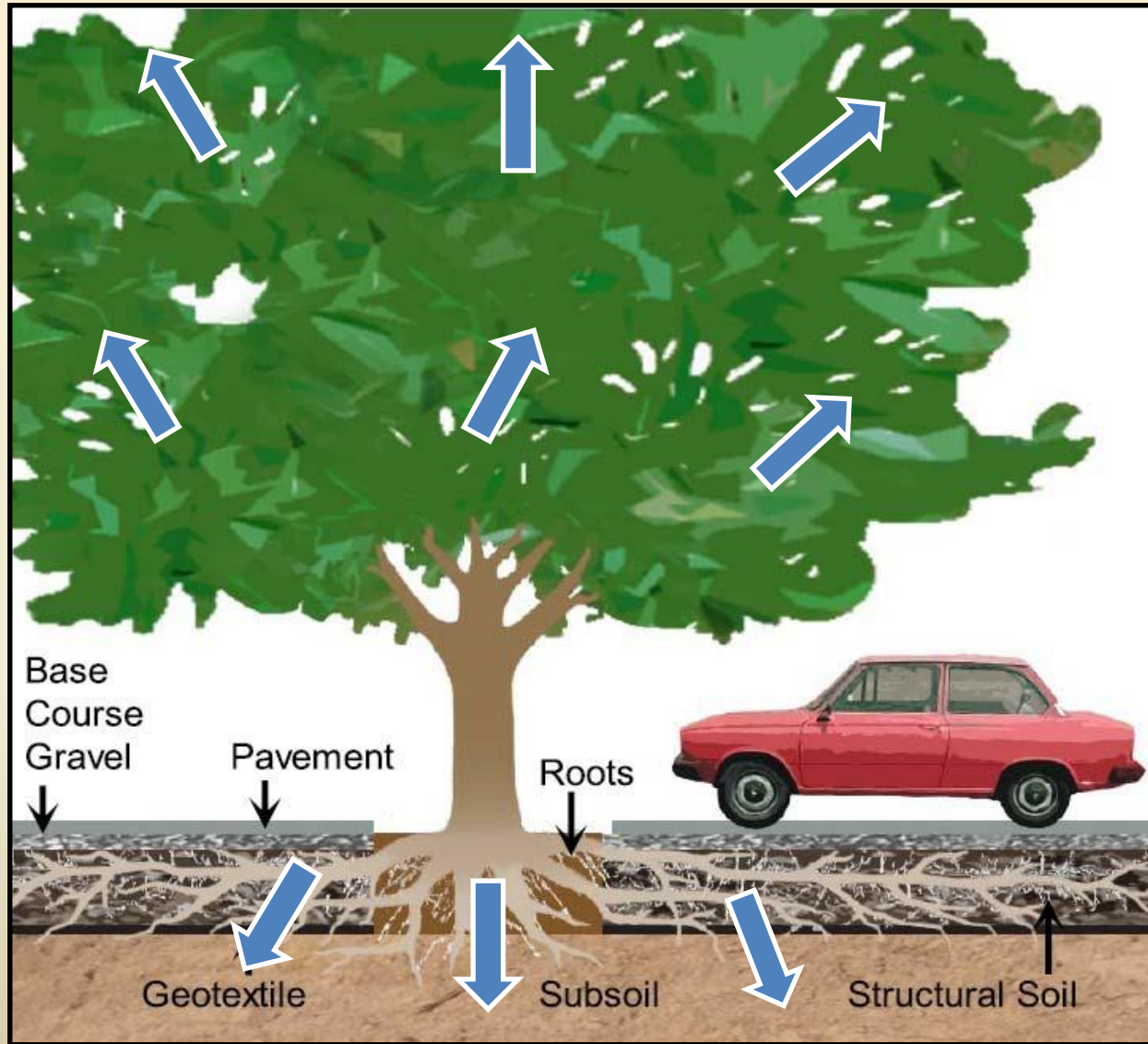
Center for Urban Forest Research
Pacific Southwest Research Station,
USDA Forest Service
1 Shields Avenue, Suite 1103
Davis, CA 95616-8587
(530) 752-7636 • Fax (530) 752-6634
<http://cufi.ucdavis.edu/>

The Role of Trees - Stormwater Management Technique:

- Interception
- Guidance



The Role of Trees - Stormwater Management Technique:



- Infiltration
- Transpiration

Additional Tree Benefits:

- Reduce particulate pollution
- Moderate temperatures
- Save energy
- Contribute to the surrounding aesthetics



Benefits of Going With Native Plants:

There are many benefits to using native plants in your landscape - for you, for your community, and for wildlife.

Wildlife

- Protective cover for many animals.
- Seeds, nuts, and fruits for squirrels and other mammals.
- Seeds, fruits, and insects for birds.
- Nectar for hummingbirds and butterflies.
- Larval host plants for butterfly caterpillars.
- Low Maintenance – native to local soils.



Prevent Introduction of Invasive Plants:

- Use native plants in landscaping to prevent chances of potentially invasive, exotic plant species.
- Many invasive species present today were introduced as landscape plantings or food sources many decades ago.
- Continued introduction of new exotic plants into suburban landscapes will result in many new invasive plants in the future.



Asian Bush Honeysuckle

Prevent Introduction of Invasive Plants:



Creeping Charlie



Prevent Introduction of Invasive Plants:



Kudzu



Prevent Introduction of Invasive Plants:



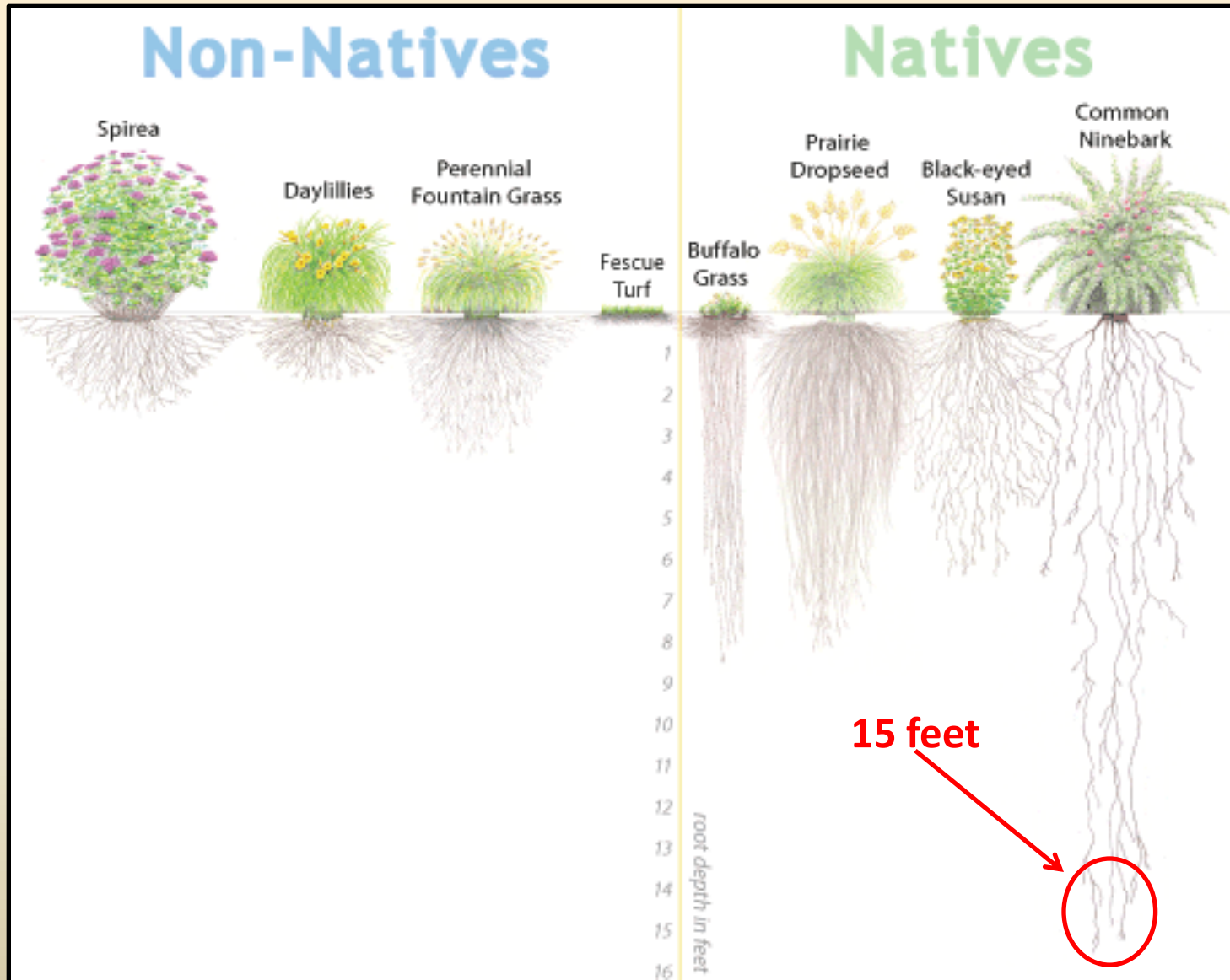
Giant Hogweed

Ever Seen these Before:

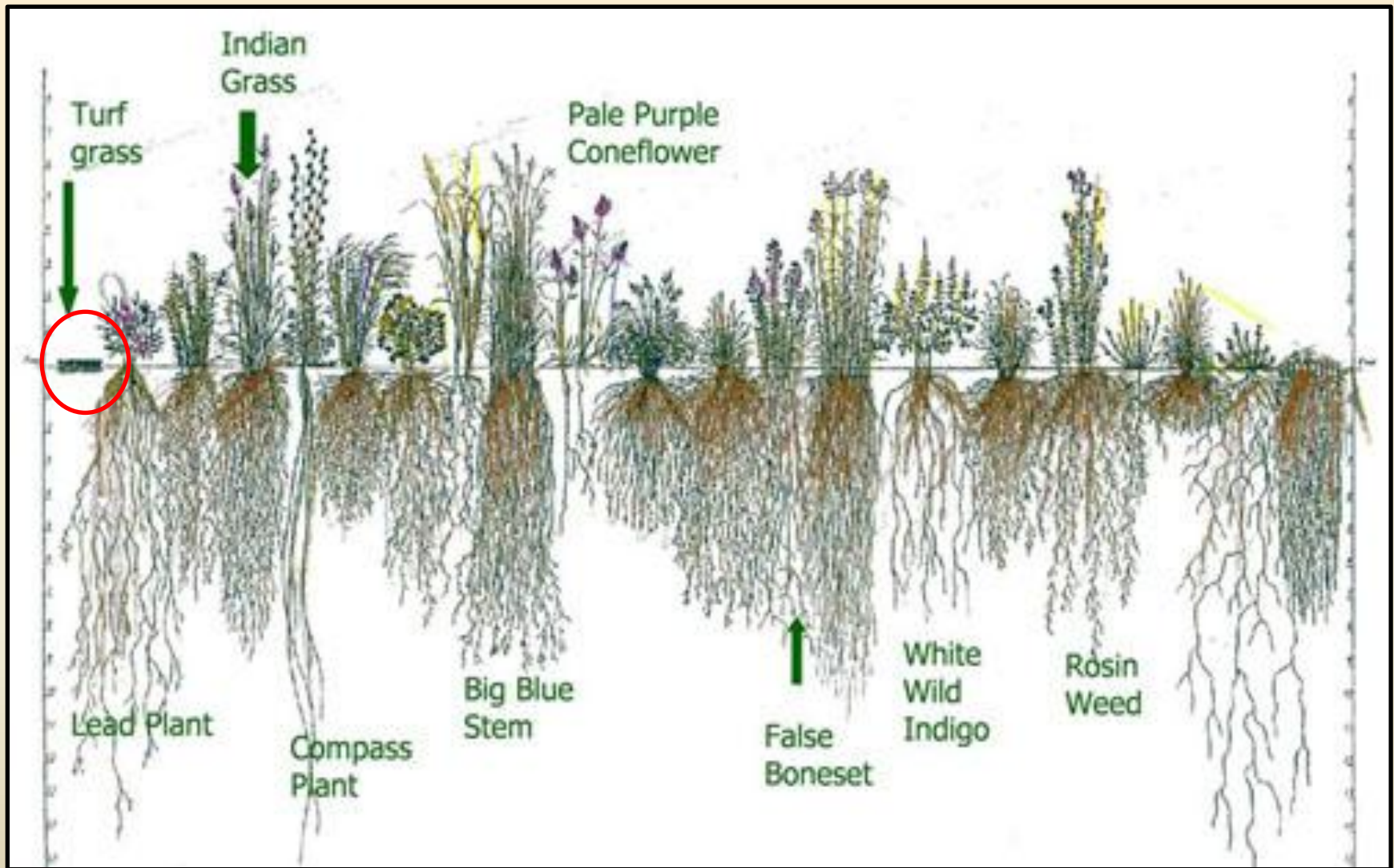


Dandelions

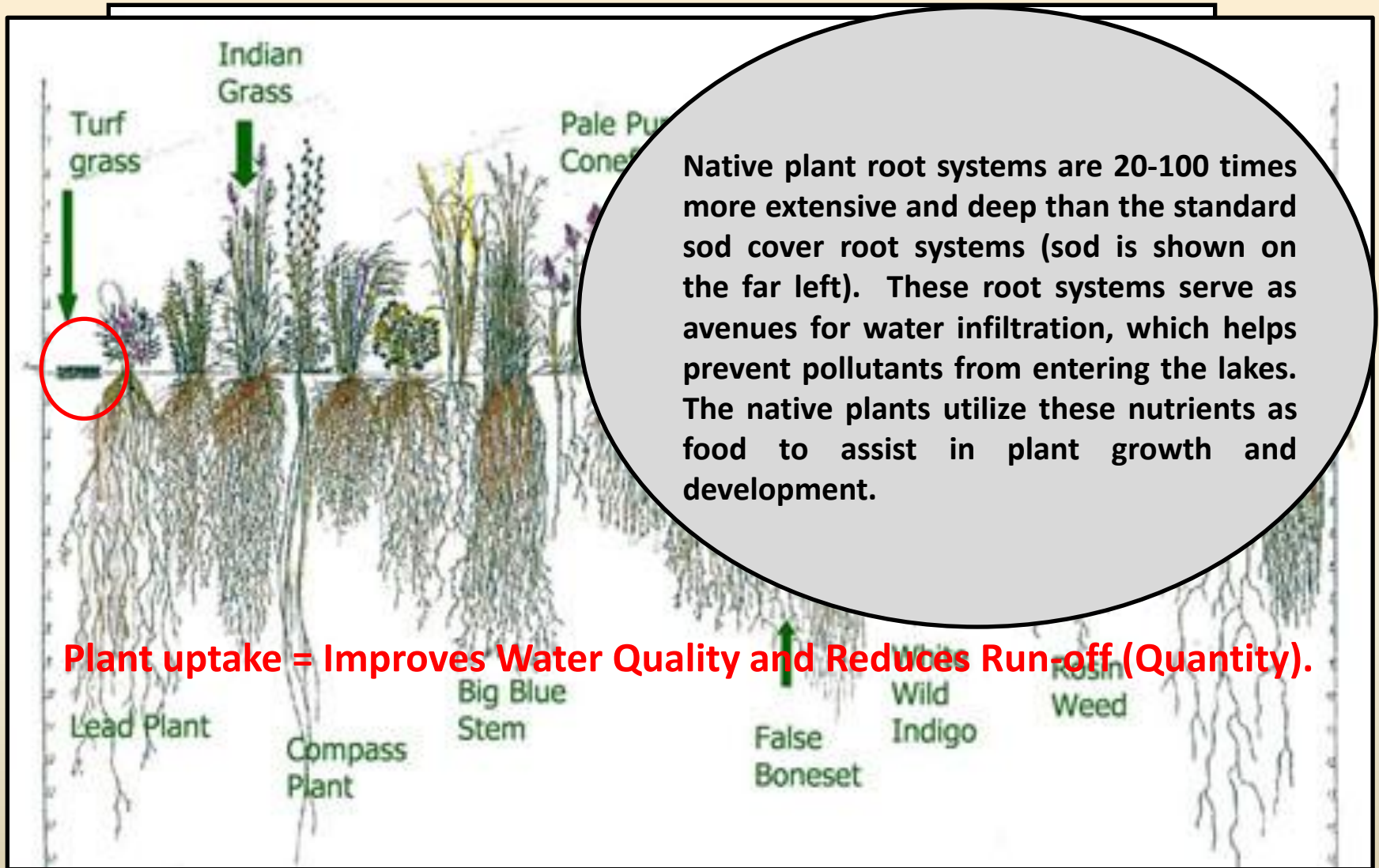
Managing Stormwater With Native Plants:



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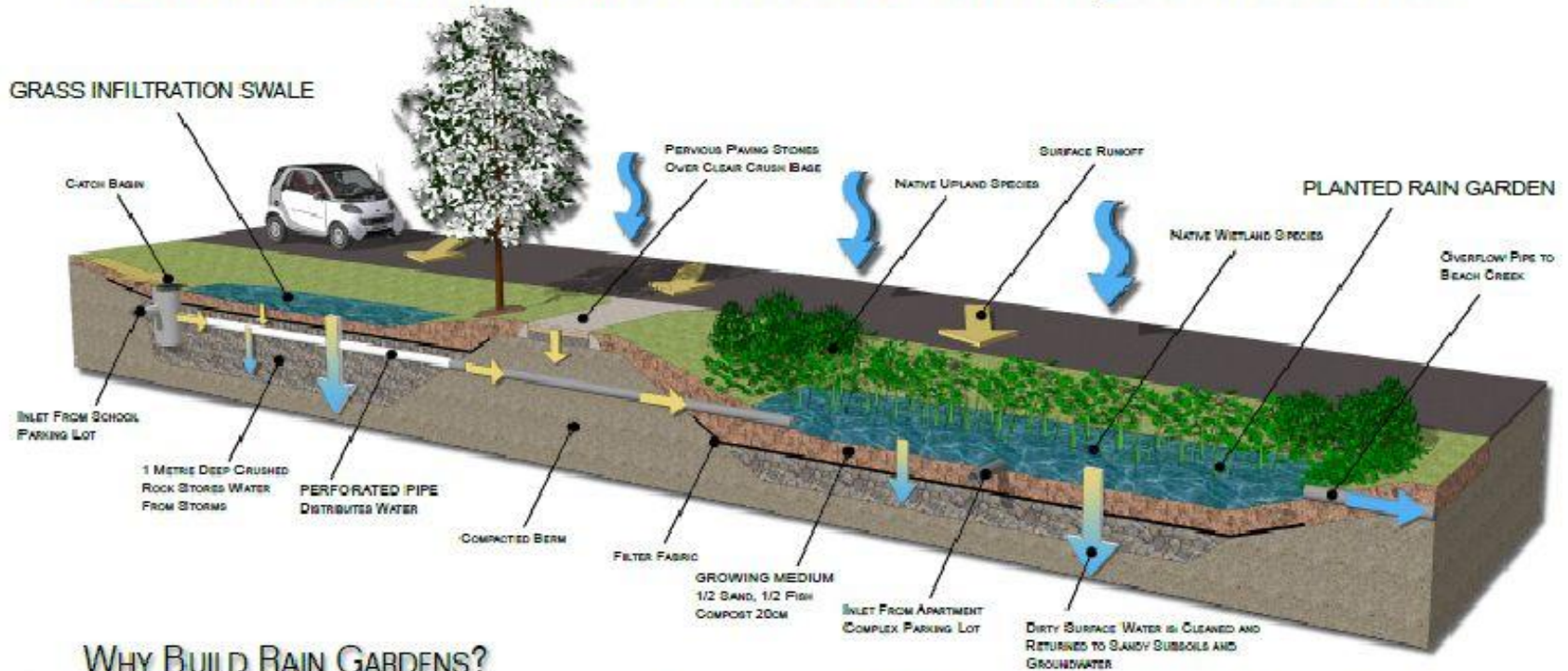
Plant uptake = Improves Water Quality and Reduces Run-off (Quantity).



Managing Stormwater With Native Plants:

RAIN GARDENS: PUTTING WATER BACK WHERE IT BELONGS... ... INTO THE GROUNDWATER - FEEDING, NOT DESTROYING, OUR STREAMS

THIS LOW MAINTENANCE RAIN GARDEN AND GRASSY SWALE STORES, ABSORBS AND CLEANS WATER RUNNING OFF PARKING LOTS AND ROAD SURFACES. SURFACE WATER SOAKS INTO THE SANDY SOILS AND UNDERGROUND RESERVOIR - LEAVING A DRY SURFACE BETWEEN RAIN FALL. FOR MORE INFORMATION ON THIS RAIN GARDEN OR FOR BUILDING A HOME VERSION, PLEASE VISIT WWW.MVIHES.BC.CA



WHY BUILD RAIN GARDENS?

REDUCE FLOODING & STREAM EROSION

- RAIN GARDENS SLOW DOWN AND ABSORB RUNOFF FROM IMPERVIOUS SURFACES LIKE PAVEMENT AND ROOFTOPS.
- REDUCING PEAK RUNOFF PROTECTS BEACH CREEK FROM EXCESSIVE FLOODING AND EROSION OF THE STREAMBED, THEREFORE MAINTAINING FISH HABITAT.

SUPPORT SUMMER STREAM FLOWS & WELLS

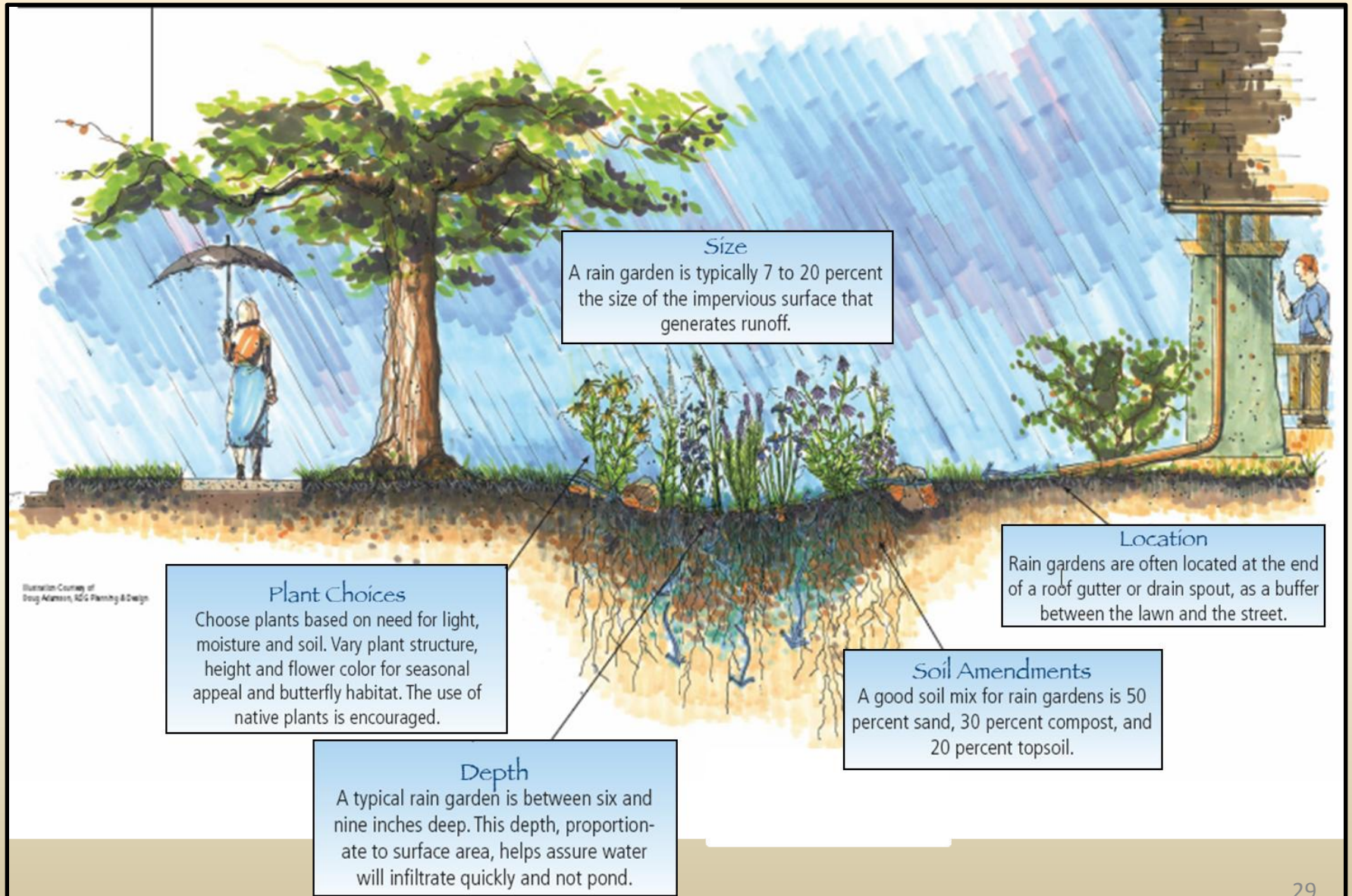
- RAIN GARDENS STORE AND ABSORB RUNOFF - REPLENISHING SOILS, WELLS AND STREAMS WITH COLD, CLEAN GROUND WATER, WHICH IS CRITICAL DURING TIMES OF DROUGHT.

MINIMIZE WATER POLLUTION

- SOIL AND VEGETATION IN THE RAIN GARDEN FILTER OUT MOST POLLUTANTS THAT HARM AQUATIC LIFE, SUCH AS THE TRACE METALS, OILS AND SEDIMENTS THAT RUN OFF VEHICLE PAVEMENTS.

A PROJECT OF QUALICUM BEACH STREAMKEEPERS

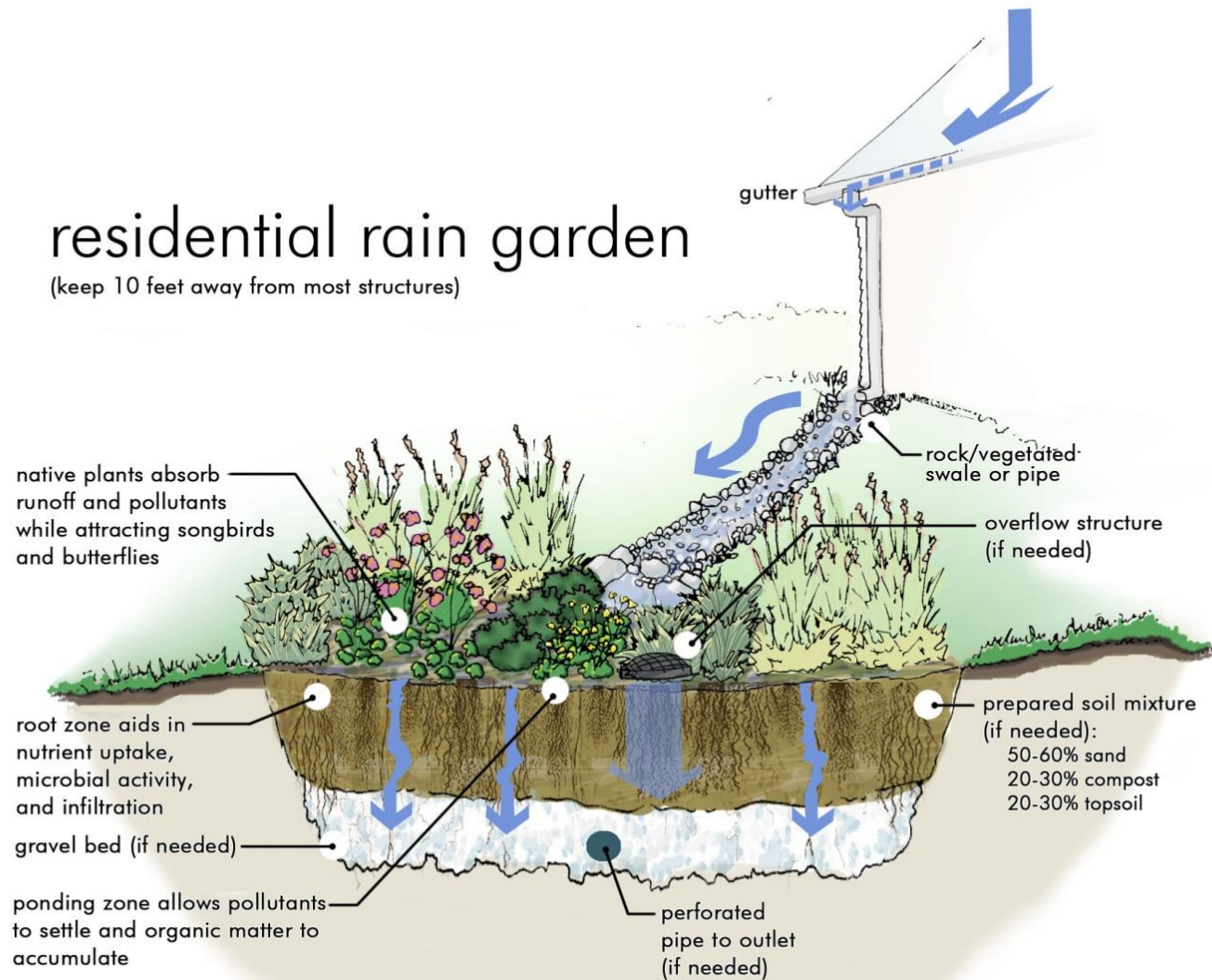
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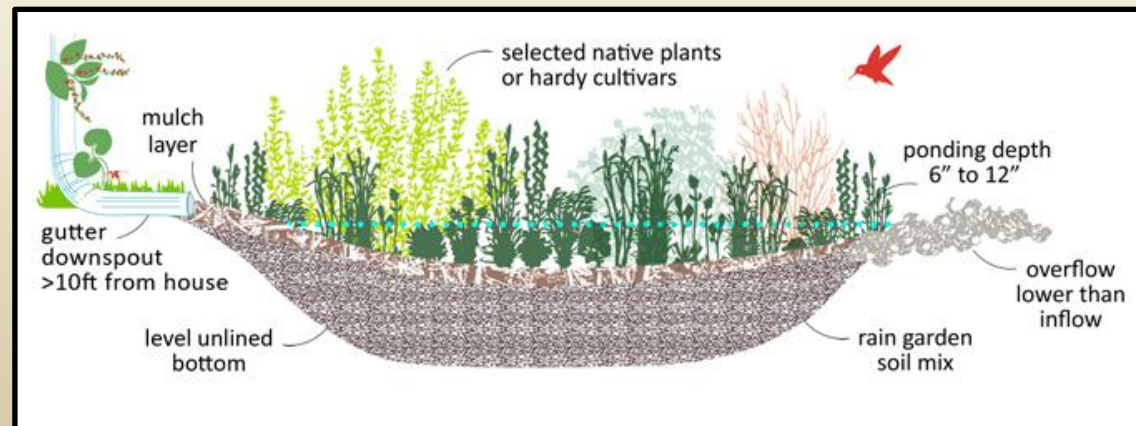
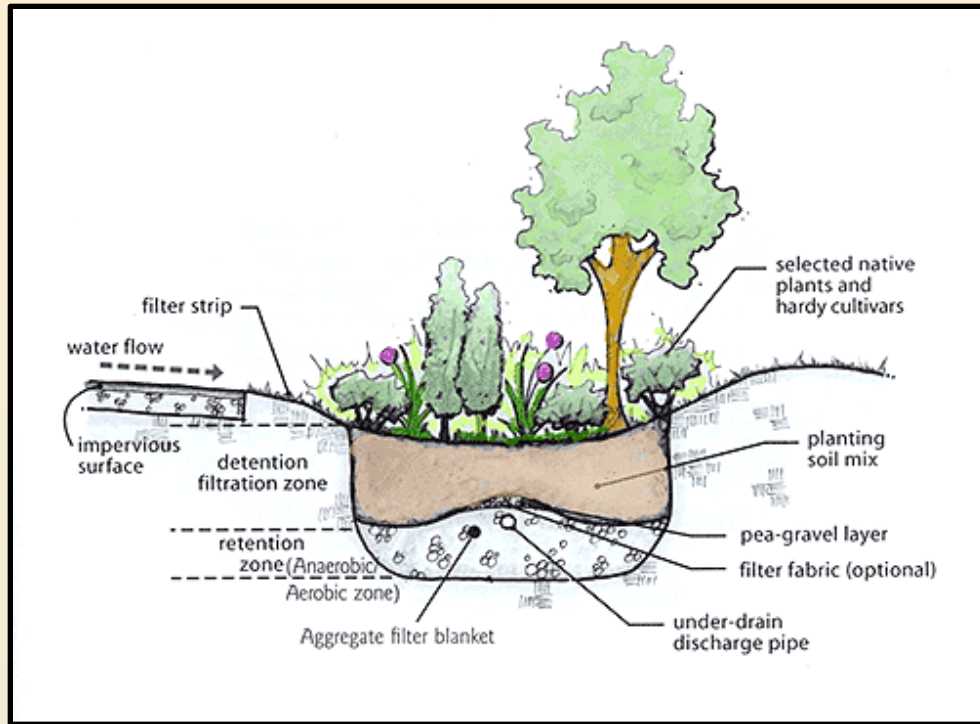
Managing Stormwater With Native Plants:

residential rain garden

(keep 10 feet away from most structures)



Managing Stormwater With Native Plants:



Native Buffalo Grass Lawn:



Deeper root system than traditional turf lawns.

No-Mow Lawn Seed Mix:



Drought Tolerant & Low Maintenance – Grows in Sun and Shade.

Thank you - Trees and Plants Do Make a Difference.

Questions?

**Richard DeWitt, CISEC, CMS4S
Stormwater Coordinator
City of Franklin
317-346-1212**

**James Farr, CPESC
ISA Certified Arborist, IN-3309A / MS4
City of Franklin
317-736-3660**

