



# Plant Identification and Selection

Using Plants For Process Based Restoration In the Urban Environment

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*December 7th 2011*

# I. Process Based Restoration

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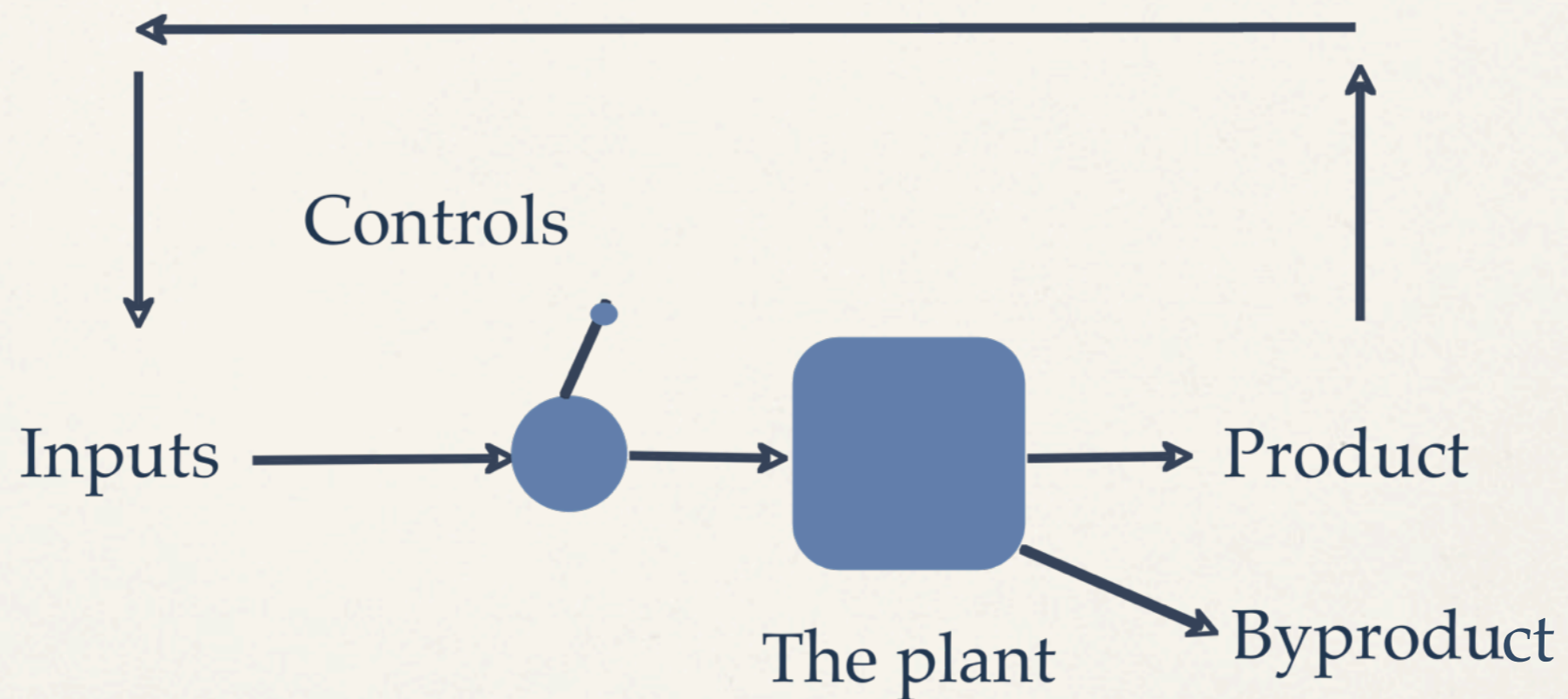


Pritchard Beach Park

- ❖ Static vs Dynamic view of ecosystems.
- ❖ We need to design for a novel set of conditions.
- ❖ We need to design systems that can fix themselves.
- ❖ We need to limit error by designing to real site conditions not a preconceived ecological end point.

# Thinking about Design

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# Typical Problems in Urban Restoration

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- ❖ Fractured Matrix
- ❖ Poor Soils / Soil Compaction
- ❖ Altered hydrology
- ❖ Invasive Species
- ❖ Constraints and Stakeholders

# The Matrix

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# Fractured Matrix

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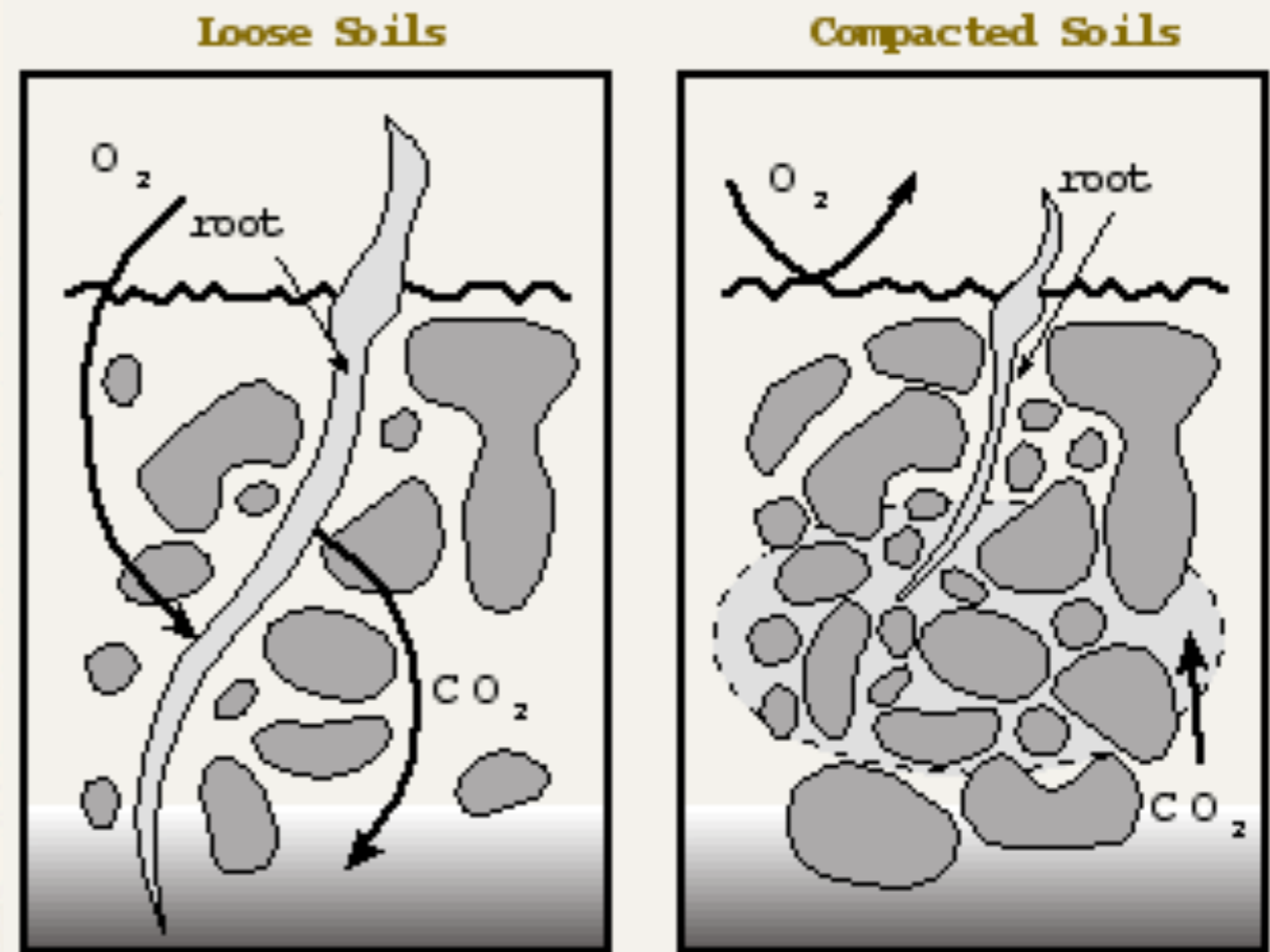
Licton Springs Park



Maury Island Marine Preserve

# Compacted Soils

- ❖ Inhibited nutrient and water uptake
- ❖ Interrupted air / gas exchange
- ❖ Inhibited root penetration
- ❖ Likely the #1 reason for poor production in restoration plantings



Ohio State Extension Bulletin 898 [http://ohioline.osu.edu/b898/b898\\_7.html](http://ohioline.osu.edu/b898/b898_7.html)

# Invasive Species

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Invasive species interrupt natural recruitment and regeneration.

# Constraints and Stakeholders

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- ❖ Stakeholder From Webster- “One who is involved in or affected by a course of action.”
- ❖ Constraints in the urban context usually stem from a multi-use scenario. We have to understand them and consider them when designing any phase of the project.
- ❖ Understanding constraints really is what makes urban restoration fun! This is the puzzle that needs our efforts and talents as managers.

# II. Plant Selection and Identification

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- ❖ We should select plants that help us achieve the long term goals of our project.
- ❖ Consider Plants your co-workers. They have a job to do!
- ❖ Plant ID in restoration is much more about identifying “what plants do” for the system rather than just “what they are”.

# Understanding Problems and Defining Objectives

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## Problem



## Objective

### ***Declining forest overstory***

Invasive species (HEHE et al. ) dominating canopy and forest floor. Limited opportunity for forest regeneration.

***Objective 1-4:*** Install native riparian plant species to increase structural complexity, biological diversity, and to resist re-invasion by exotic plant species.

***Task 1-4a:*** Native plants will be selected and planted according to their moisture and light requirements, growth rate and ability to out-compete invasive *species*, wildlife use, and appropriateness as barriers that discourage trail users from disturbing the site (i.e. *Rosa* spp.). The aesthetic appeal of plantings will be considered, especially for the upper edge of polygon 1, which is adjacent to trail. Plant selection for this edge will also be kept to species that grow no larger the 2-3m, and will be planted approximately .5m from the trail so that they will not incur maintenance costs.

***Approach:*** A planting plan, included in this document, has been drawn up (see figure 3). This plan shows the suites of native plants that will be planted in each polygon, which is recommended by Invasive Prevention Guidelines (Clark 2003). Plants will be obtained from several nursery sources during the months of January and February. Plants will be installed according to the plan, which indicates close spacing in order to ensure survival even if some plants are poorly planted or come from bad stock. Willow stakes planted at high density have been shown to suppress invasive encroachment. (Kim and others 2006).

# Selecting Plants

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- ❖ Choose plants that fit your constraints and further your objectives
- ❖ Not every plant appropriate to your target ecosystem will work at your site. Don't waste resources!
- ❖ Perhaps your target ecosystem needs to be abandoned for an alternate with better outcomes. (This can be very hard to sell to your stakeholders)

# III. Plant ID

## Examples of plants that address common restoration problems

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Alder- provides nitrogen  
and grows quickly to  
provide full shade



Willow- Versatile, can be staked.  
Strong roots. Can be used as  
erosion control



Snowberry- grows well in dry compacted soil



Red flowering currant- often works to make residential stakeholders happy



Thimbleberry- Can out-compete blackberry in favorable conditions



Sword fern- Extremely resilient. Stands up to abuse. Grows in deep shade in quick soils.

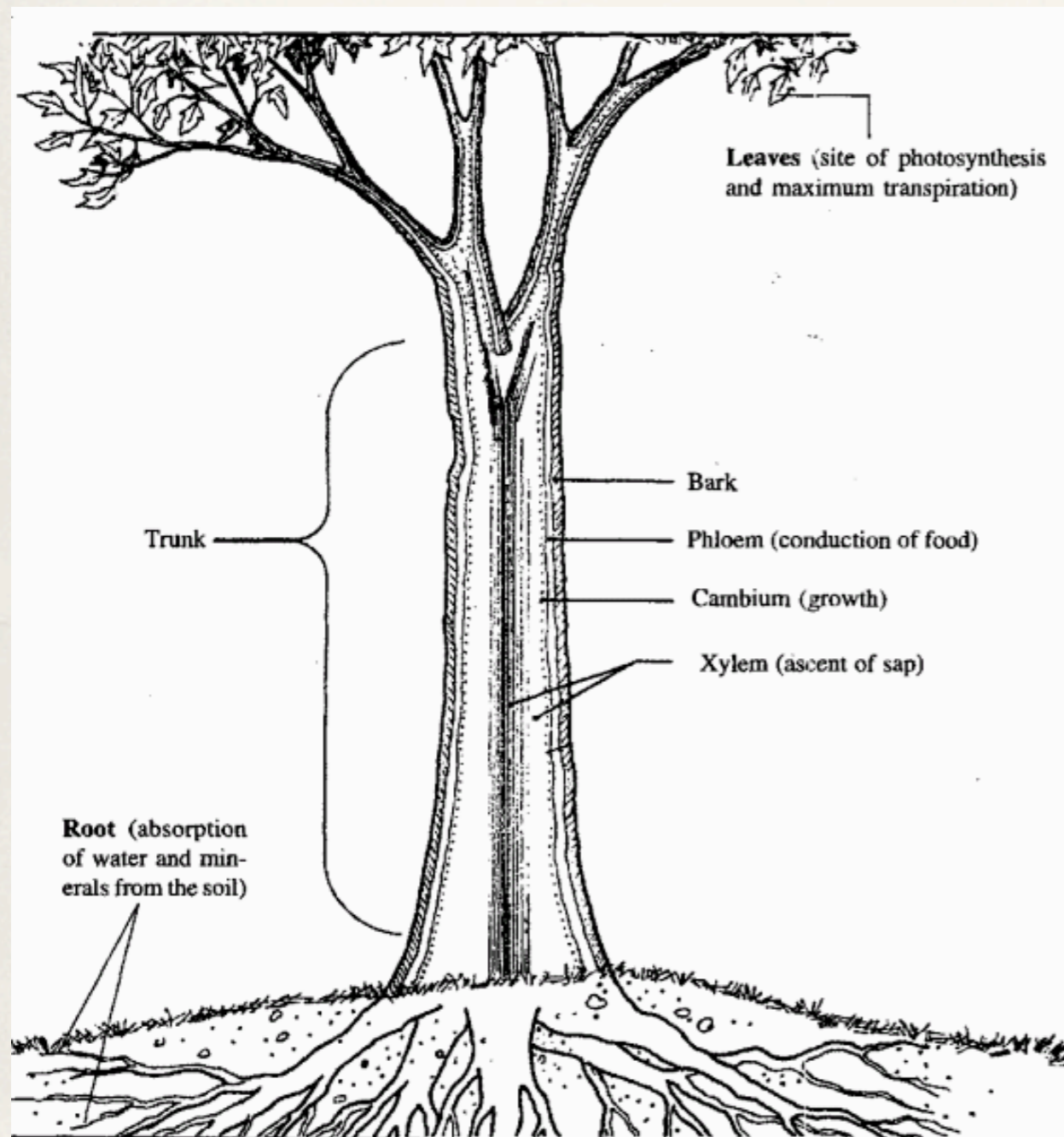
# Plant Materials, Installation and Maintenance

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- ❖ What, when, where, why and how
- ❖ Plant physiology as it relates to soils and climate
- ❖ Types of plant materials and their advantages
- ❖ Good installation technique
- ❖ Maintenance and Monitoring

# Physiology

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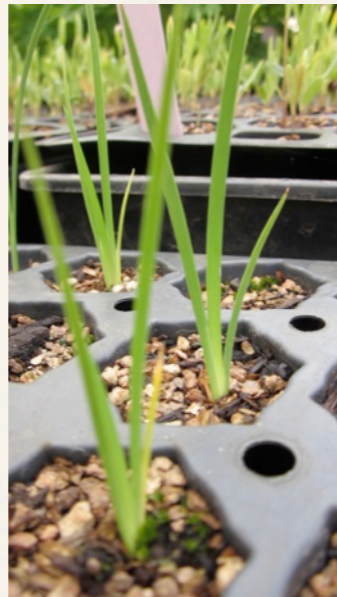


- ❖ Plants need air, water, nutrients and heat to grow.
- ❖ Limiting any of these factors inhibits productivity. Some more than others.
- ❖ Know your plant.
- ❖ Know your season! (Earth Day is a terrible time to plant in the PNW)

# Plant Materials

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- ❖ Seeds
- ❖ Plugs
- ❖ Bareroot
- ❖ Containers
- ❖ Plant segments
- ❖ What are the pros and cons of each? Choose carefully.



# Installation

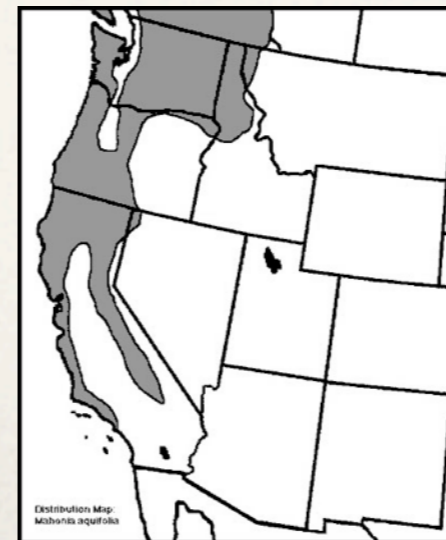
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- ❖ Take the time to get to know your suppliers. See the plants before you order. Get references.
- ❖ Recognize good nursery stock
- ❖ Use “state of the art” planting practices. Not all planting techniques are appropriate for restoration.
- ❖ Consider the long term care in to project costs up front!

# Good nursery stock

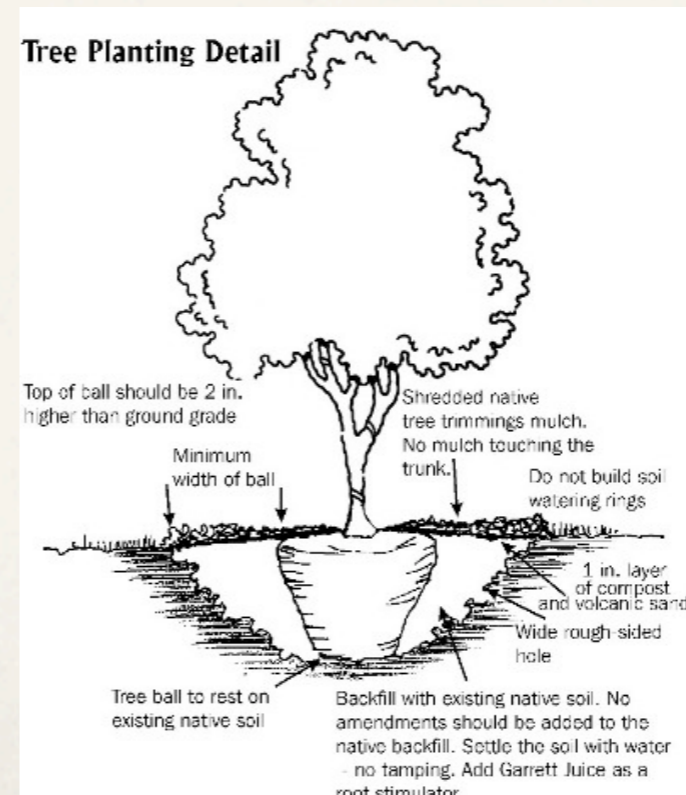
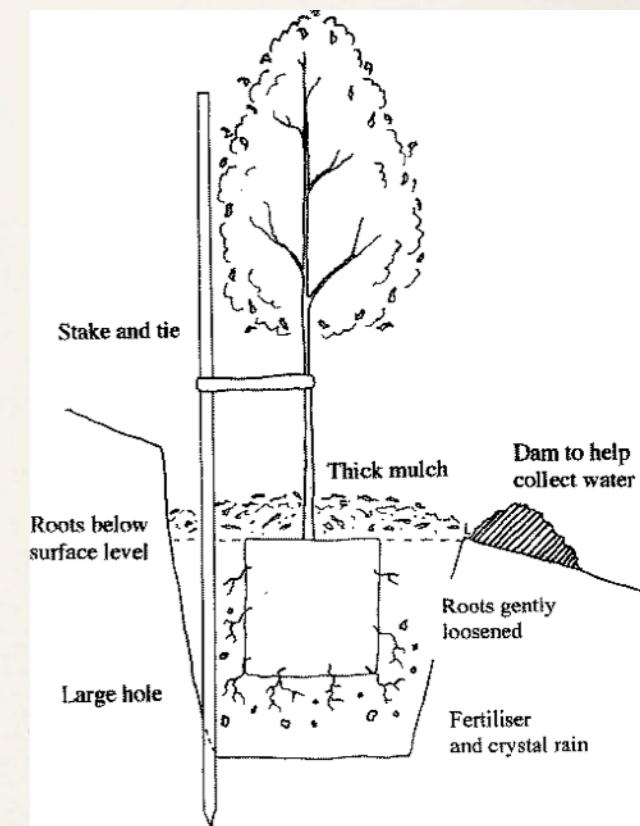
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- ❖ Is sized right for the container it is in.
- ❖ Is visibly free from stress and disease.
- ❖ Consider provenance.



# Planting

- ❖ After being packaged plants need to stretch out.
- ❖ It is ok to damage roots within reason.
- ❖ Take care with the root collar.
- ❖ It is ok to excise damaged vegetation.
- ❖ De-compact soil as much as possible.

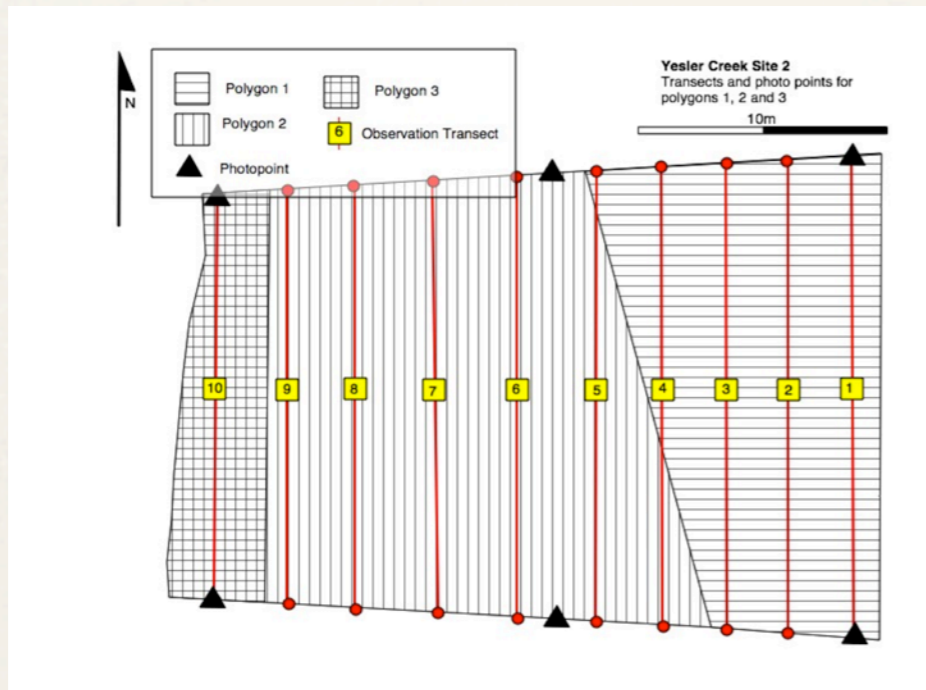


# After-Care

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- ❖ Mulch - Be as selective with your mulch as you are with your plant materials. See it before you order. SERIOUSLY.
- ❖ Water - Do everything you can in the planning phase to minimize. Water is VERY expensive in the restoration context. Good plant selection and installation technique is not.
- ❖ Weed - Establish thresholds for invasive coverage. Act immediately when they are exceeded.
- ❖ Replace - Plan to lose some plants. Budget for sequential years of planting.

# Monitoring



- ❖ Develop Benchmarks and Thresholds
- ❖ Implement regular monitoring to evaluate progress towards goals.
- ❖ Destructive testing. Check the work of others!
- ❖ Publish, Publish, Publish

# Conclusion

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- ❖ Plant identification is much more than knowing a name.
- ❖ It is understanding how to identify stressors and actors that can help or hinder your efforts towards a healthy ecosystem
- ❖ It is identifying good technique and information with regards to the selection plant materials
- ❖ It is identifying parameters for evaluating the success of your efforts and avenues to discuss your outcomes.

# Questions?

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Justin M. Howell MEH  
Principal / Managing Member  
Applied Ecology LLC  
206.484.6582  
[justin@applied-ecology.com](mailto:justin@applied-ecology.com)

Thank You!!!