



- ### Questions to Ask:
- What is already growing here?
 - What is worth preserving?
 - What invasives should we attempt to manage as part of the disturbance?
 - What are the site conditions now?
 - Will site conditions change as part of the project?
 - Should we try to improve diversity?

Select Appropriate Plants and Seed Mixtures

- How steep is the site?
- Will it be mowed?
- Is it subject to road salt or other pollutants?
- Are aesthetics important?
- Is wildlife use important?

Scientific Name	Common Name	Site Moisture					Light			Soil pH		
		WET/ STANON O WATER	MOIST TO WET	MOIST WELL DRAINED	DRY TO MOIST	D R Y	D S U N	P A R T	S H A D E	A C I D	N E U T R A L	A L K A L I N E
TREES												
Deciduous												
Acer rubrum	red maple		X	X	X			X	X		X	X
Acer saccharum	sugar maple		X	X	X			X	X			X
Acer saccharinum	silver maple											
Acer spicatum+	mountain maple		X	X	X			X	X		X	X
Betula lenta	black birch				X			X	X		X	X
Betula alleghaniensis	yellow birch		X	X				X				X
Betula populifolia	gray birch		X	X	X						X	X
Betula nigra	river birch		X		X			X			X	X
Betula papyrifera	paper birch		X	X				X			X	X
Carpinus caroliniana	american hornbeam		X		X			X	X		X	X
Carya cordiformis	bitternut hickory			X				X	X		X	
Carya glabra	pinnut hickory											
Carya laciniosa	shellbark hickory											
Carya ovata	shagbark hickory			X				X	X		X	
Carya tomentosa	mockernut hickory											

Scientific Name	Common Name	Aesthetics					
		FLOWER	FALL LEAF	FRUIT	BARK	TWIG	PROFILE
TREES							
Deciduous							
<i>Acer rubrum</i>	red maple	early spring-red	red	winged	silver gray-gray brown	red	oval
<i>Acer saccharum</i>	sugar maple	not showy	yellow	winged	silver gray	not showy	oval to round
<i>Acer saccharinum</i>	silver maple						
<i>Acer spicatum</i> +	mountain maple	not showy	yellow-orange-red	winged		red with white stripes	
<i>Betula lenta</i>	black birch	not showy	yellow	not showy	smooth, dark	not showy	pyramidal to rounded
<i>Betula alleghaniensis</i>	yellow birch	not showy	yellow	not showy	yellow, peeling	not showy	irregular or rounded
<i>Betula alleghaniensis</i>	gray birch	not showy	yellow	not showy	smooth, red-brown to white		narrow conical
<i>Betula nigra</i>	river birch	not showy	yellow	not showy	peeling, multicolor	not showy	oval to round
<i>Betula papyrifera</i>	paper birch	not showy	yellow	not showy	white, peeling	not showy	pyramidal to round
<i>Carpinus caroliniana</i>	american hornbeam	not showy	yellow to red	nutlet in a winged bract	muddled appearance	not showy	multitemmed

Scientific Name	Common Name	Problems			Planting Season		
		SHALLOW ROOTS	INSECTS	DISEASES	SPRING PLANTING ONLY	SPRING OR FALL	OTHER
TREES							
Deciduous							
<i>Acer rubrum</i>	red maple		leaf hoppers	verticillium	X		sensitive to salt
<i>Acer saccharum</i>	sugar maple	X		verticillium	X		sensitive to pollution, salt & compaction
<i>Acer saccharinum</i>	silver maple						
<i>Acer spicatum</i> +	mountain maple						withstands repeated, heavy browsing
<i>Betula lenta</i>	black birch		birch leaf miner	canker	X		sensitive to compaction
<i>Betula alleghaniensis</i>	yellow birch				X		intolerant of drought, heat
<i>Betula populifolia</i>	gray birch		birch borer, leaf miner		X		subject to snow & ice damage
<i>Betula nigra</i>	river birch					X	
<i>Betula papyrifera</i>	paper birch		birch borer				intolerant of heat & pollution
<i>Carpinus caroliniana</i>	american hornbeam			canker	X		sensitive to compaction; doesn't transplant well; tolerant to pruning

Provide Oversight for Correct Timing, Location, Methods

Review After Planting and Re-plant, As Needed

- Are plants living?
- Is there adequate cover to prevent erosion?
- Are there problems with herbivory?
- Are other goals being met (habitat, aesthetics, etc.)?

Track Successes & Failures

- What worked? What didn't? Why?
- Were there specific problems with site conditions, plant materials, contractor habits, or other items that could be improved?
- Did getting complete cover mean making compromises in goals related to use of native plant materials? If so, how can that be improved?

Those who do not learn from their mistakes are bound to repeat them.

Paraphrased from Santayana

What happens if you choose the right plant but the wrong size?



In this case, slope stability problems were not solved by planting.

Plant materials were too large for planting on this steep (2:1) slope and they slid down to the toe of the slope.



Some plants survived.

What we learned from this:

- When planting on very steep slopes think in terms of planting small material, such as ferns, vines, and low-growing shrubs at the top of the slope and increase the size of material as you go down.
- This also helps with considerations such as roadside mowing and traffic safety.

What happens when seeding is done too late in the fall?

- Native warm season grasses were hydroseeded along with native ryegrass in late November.
- Rills began to form before anything germinated.
- The entire site needed to be covered with erosion blanket and was successfully re-seeded the next spring.



What we learned from this:

- If an entire area is to be seeded too late in the year for any native species to germinate either a) erosion blanket the entire area and wait till spring to seed or b) go ahead and seed the area with annual ryegrass and blanket the area, if needed.
- Either way, you can't count on warm days in December to germinate your seed and you WILL have to seed your native warm-season grasses the next spring.

What happens if mowing occurs too soon or too often?

It depends on the height of the mower blade and the type of plants—the plants may be killed if they're not perennials, don't sprout easily, and the root systems haven't gotten established.



What we learned from this:

- If your native grass and wildflower meadows will be mowed, ask the crew to do it with the mower blade set at least 6-12 inches off the ground and preferably do the mowing between November and March. Wash the mower beforehand, if possible.
- Don't assume things are dead until about 3 years after planting.

What happens when nearby landowners or recreational users don't understand?



- Plants may be stolen or vandalized because people think they are something they'd like in their landscaping, because landscapers understand the cost of the plants or because people think they're "brush".
- Contractors stuck in this predicament will be unhappy if they have to replace stolen plants.

What we learned from this

- Need to consider contractor responsibility in case of vandalism or theft.
- Signs that explain the reasons for the planting may help reduce complaints
- Some people are just bad eggs when it comes to native plantings.

What happens when your wetland plants aren't grown in a wet nursery ?



- Plants that were meant to be planted in an area with standing water were purchased from a nursery where conditions were moist but not as wet as the site.
- First year mortality was nearly 100% in the area with standing water but much better where conditions were wet but not inundated.

When Restoration Works



Slopes Stabilized



Good Cover Good Survival



Forest Restored



Wetland Functions Restored



Wildlife Habitat Re-established



Improved Diversity & Aesthetics



Conclusions

- Contract language needs to cover contingencies for theft, herbivory, drought, new invasions, etc.
- Contract language also needs to establish who is responsible for plant monitoring and care and for how long.
- Do check contractor references and turn down those who don't check out.
- Don't assume general landscaping contractors or nurseries have a clue about native plants or how to establish them in natural environments.

Conclusions (cont'd)

- When possible, additional funding and manpower should be available for follow-up management over the course of 3 to 10 years—longer when stormwater management structures are involved.
- Establish protocols for follow-up: schedule for monitoring, actions to take when needed, etc.
- Establish relationships with people who maintain areas—they are your eyes & ears AND they have experience with sites.

Questions?



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