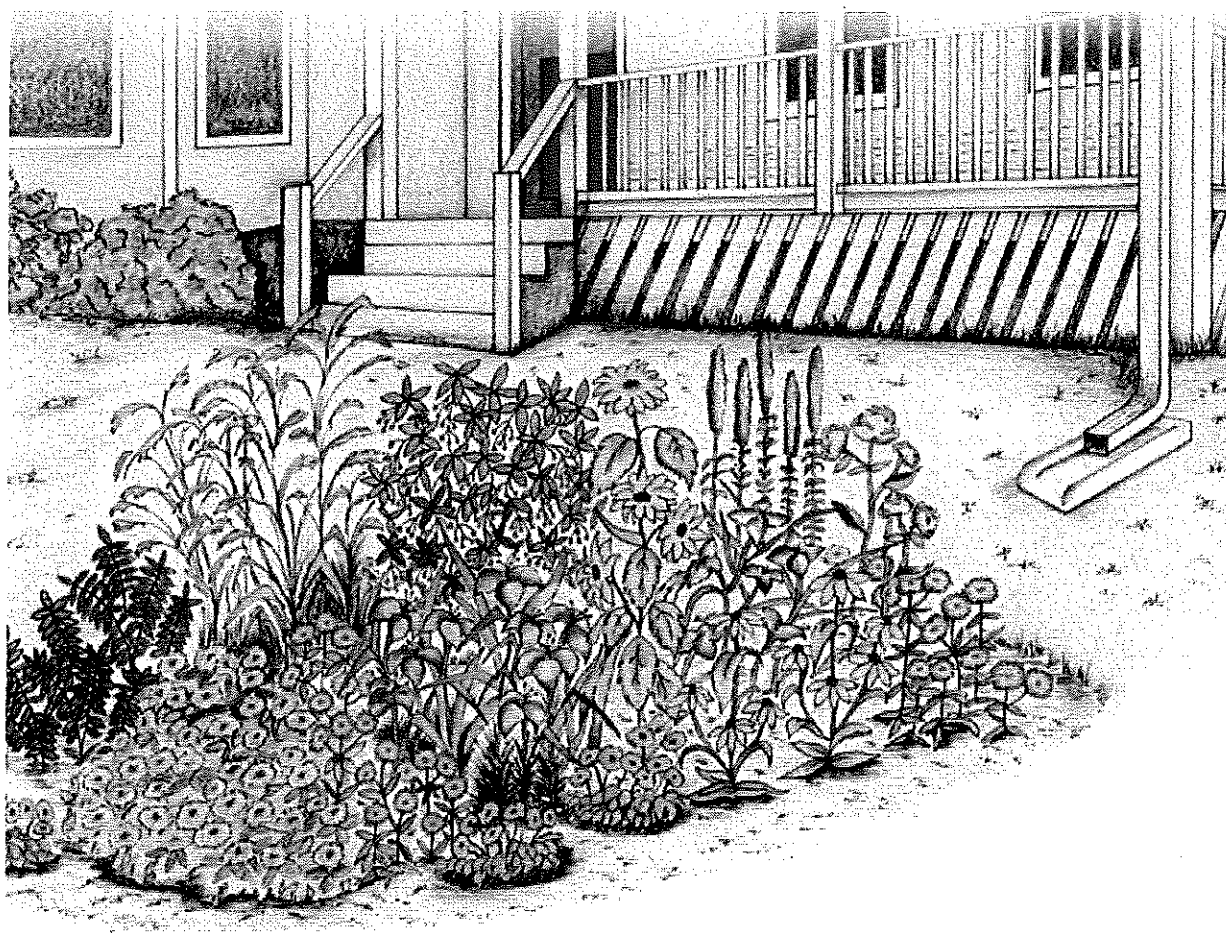
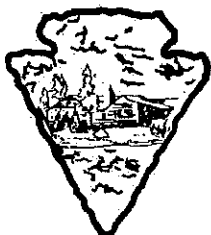


Rain Gardens

Some guidance and Suggested reading



www.canr.uconn.edu/



Prepared for:
Medford Lakes Garden Club
Jan 23, 2008

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Getting Started with Rain Garden Design

1. First step is to calculate the water volume from the downspout.
Use only the roof portion that feeds into the downspout
 $\text{Roof length} \times \text{roof width} \times \text{rain height} = \text{volume}$
(math purists will want to include the roof angle. Forget them, this is not a math class.)
Use 1.25 inches for rain height.
(Ninety percent of rain storms in our area are less than 1.25 inches.)
2. Next step is to calculate the volume of the rain garden. Keep the depth around six inches. No magic number here, could be three inches, could be eight inches.
Layout the garden area to contain the rain volume calculated in Step 1.
The garden's edge should be no less than ten feet from your house and your neighbor's property line.. The water collected could find its way into your basement or your neighbor's if the placement is less than ten feet.
3. Next step is to do a percolation test. Some areas drain faster than other areas.
See page 2 for a suggested percolation test method.
You absolutely want the drain time of the rain garden to be less than three days. Mosquitoes may breed in water that stands for four or five days.
4. Read the references cited for more detail on construction.

Test Method to Determine the Percolation Rate of Soil

Equipment Needed:

Large can with top and bottom removed; coffee, juice, whatever

12 inch ruler

Timer

Quart of water

Trowel

Time Needed:

30 minutes for set up

Four hours, or so, to conduct test

Test procedure;

1. Remove plant material and roots from an area a little larger than the diameter of the can.
2. Insert to can into the cleared ground area about three inches. The top of the can should be at least 4 inches from the ground surface. Tamp the soil around the can to prevent leakage.
3. Fill the can to the top with water and start the timer.
4. After one hour, measure the height of the water from the top of the can. Record the measurement a H1.
5. Repeat this measurement every hour for the 4 hour test time. Record the measurements as H2, H3 and H4.
6. Each successive measurement must have a delta of at least 1/4 inch for the area to be suitable for a Rain Garden.
That is $H1 > 1/4$ inch, $(H1-H2) > 1/4$ inch, $(H2-H3) > 1/4$ inch, $(H3-H4) > 1/4$ inch.

Interpretation of Results

The location is an excellent spot for a rain garden if all of the water has percolated into the ground.

The location is a suitable spot for a rain garden if all the measurement deltas are no less than 1/4 inch.

The location is not suitable for a rain garden if the measurement deltas are less than 1/4.

Suggested Reading

for Rain Gardens:

[to be provided]

for plants:

Reference 1: "The Plants of Southern New Jersey" by Witmer Stone

Reference 2: "Wildflowers of the Pine Barrens of New Jersey" by Howard Boyd

Plants Suggested for Delaware Rain Gardens

Wildflowers					
Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Amsonia ciliat</i>	Downy amsonia				
<i>Amsonia hubrechtii</i>	Arkansas amsonia				
<i>Amsonia tabernaemontana</i>	Blue Star				
<i>Aquilegia canadense</i>	Canadian Columbine				
<i>Arisaema triphyllum</i>	Jack-in-the-Pulpit				
<i>Asclepias incarnata</i>	Swamp Milkweed				
<i>Aster novae-angliae</i>	New England Aster				
<i>Aster novi-belgii</i>	New York Aster	4 ft	moist	sun	sep-oct
<i>Baptisia australis</i>	False indigo				
<i>Boltonia asteroides</i>	Boltonia				
<i>Caltha palustris</i>	Marsh Marigold				
<i>Campanula divaricata</i>	Southern Harebell				
<i>Chelone glabra</i>	White Turtlehead				
<i>Chelone lyonii</i>	Pink Turtlehead				
<i>Cimicifuga racemosa</i>	Black Snakeroot				
<i>Convallaria majalis</i>	Lily-of-the-Valley				
<i>Eupatorium maculatum</i>	Joe-pye weed				
<i>Gillenia trifoliata</i>	Bowman's Root				
<i>Helianthus angustifolius</i>	Swamp Sunflower				
<i>Hibiscus moscheutos</i>	Crimson-eyed Rosemallow				
<i>Iris cristata</i>	Dwarf crested iris				
<i>Kosteletskyia virginica</i>	Seashore mallow				
<i>Lobelia cardinalis</i>	Cardinal flower				
<i>Lobelia siphilitica</i>	Blue Lobelia				
<i>Meehanian cordata</i>	Meehan's Mint				
<i>Monarda didyma</i>	Scarlet Beebalm				
<i>Persicaria virginiana</i>	Jumpseed				
<i>Phlox paniculata</i>	Garden Phlox				
<i>Physostegia virginiana</i>	Obedient Plant				
<i>Rudbeckia fulgida</i>	Orange Coneflower				
<i>Rudbeckia laciniata</i>	Cutleaf Coneflower				
<i>Solidago rugosa</i>	Wrinkleleaf Goldenrod				
<i>Spiranthes cernua</i>	Nodding Lady's Tresses				
<i>Stylophorum diphyllum</i>	Celandine Poppy				
<i>Tradescantia x andersoniana</i>	Virginia Spiderwort				
<i>Veratrum viride</i>	Indian Poke				
<i>Vernonia noveboracensis</i>	Common Ironweed				
<i>Veronicastrum virginicum</i>	Culver's Root				

Ferns					
Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Athyrium filix-femina</i>	Common Lady Fern				
<i>Osmunda regalis</i>	Royal fern				
<i>Osmunda cinnamomea</i>	Cinnamon fern				

Grasses					
Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Chasmanthium latifolium</i>	Indian Seaoats				
<i>Muhlenbergia capillaris</i>	Hairawn Muhly Grass				
<i>Panicum virgatum</i>	Panic grass				
<i>Sorghastrum nutans</i>	Indian grass				
<i>Spartina pectinata</i>	Cord grass				

Sedges					
Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Carex stipata</i>	Owlfruit Sedge				

Shrubs					
Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Amelanchier laevis</i>	Shadbush				
<i>Cephalanthus occidentalis</i>	Buttonbush				
<i>Clethra alnifolia</i>	Sweet pepperbush				
<i>Cornus amomum</i>	Silky dogwood				
<i>Cornus sanguinea</i>	Bloodtwig dogwood				
<i>Fothergilla gardenii</i>	Dwarf fothergilla				
<i>Ilex glabra</i>	Inkberry Holly				
<i>Ilex verticillata</i>	Winterberry holly				
<i>Lindera benzoin</i>	Spicebush				
<i>Viburnum dentatum</i>	Arrowwood				

Reference source: University of Delaware, College of Agriculture

Plants Suggested for Pennsylvania Rain Gardens

Wildflowers					
Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Aquilegia Canadensis</i>	Wild Columbine				
<i>Asclepias incarnata</i>	Swamp Milkweed				
<i>Aster novi-angliae</i>	New England Aster				
<i>Baptisa australis</i>	Wild False Indigo				
<i>Caltha palustris</i>	Marsh Marigold				
<i>Chelone glabra</i>	White Turtlehead				
<i>Clethra alnifolia</i>	Summer Sweet				
<i>Coreopsis auriculata</i>	Mouse-eared Tickweed				
<i>Echinacea angustifolia</i>	Narrow-leaf Echinacea				
<i>Equisetum hyemale</i>	Scouring Horsetail				
<i>Eupatorium dubium</i>	Joe-pye Weed				
<i>Eupatorium perfoliatum</i>	Boneset	4 ft	wet	mod	aug-oct
<i>Helenium autumnale</i>	Common Sneezeweed				
<i>Helianthus angustifolium</i>	Swamp Flower				
<i>Iris Versicolor</i>	Harlequin Blueflag Iris				
<i>Itea virginica</i>	Virginia Sweetspire				
<i>Liatris spicata</i>	Dense Blazing Star				
<i>Lobelia cardinalis</i>	Cardinal Flower				
<i>Locelia siphilitica</i>	Great Blue Lobelia				
<i>Monarda didyma</i>	Scarlet Beebalm				
<i>Oenothera fruticosa</i>	Evening Primrose				
<i>Penstemon digitalis</i>	Talus Slope Penstemon				
<i>Rudbeckia hirta</i>	Black Eyed Susan				
<i>Sambucus Canadensis</i>	Amer BlackElderberry				
<i>Solidago sphacelata</i>	Autumn Goldenrod				
<i>Stylophorum diphyllum</i>	Celandine Poppy				
<i>Tradescantia ohienensis</i>	Spiderwort				
<i>Typha latifolia</i>	Common Cattail				
<i>Verbena hastate</i>	Simler's Joy				

Ferns					
Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Onoclea sensibilis</i>	Sensitive Fern				
<i>Osmunda cinnamomea</i>	Cinnamon Fern				
<i>Osmunda regalis</i>	Royal Fern				

Pennsylvania cont.

Grasses					
Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Andropogon gerardii</i>	Big Bluestem				
<i>Briza media</i>	Perennial Quaking Grass				
<i>Elymus virginicus</i>	Virginia Wild Rye				
<i>Panicum vergatum</i>	Lowland Switchgrass				
<i>Schizachyrium scoparium</i>	Little Bluestem				
<i>Sisyrinchium angustifolium</i>	Narrow Leaf Blue Eye				
<i>Sorghastrum nutans</i>	Indian Grass				

Sedges					
Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Carex pendula</i>	Hanging Sedge				
<i>Carex pennsylvanica</i>	Pennsylvania Sedge				
<i>Carex stipata</i>	Owlfruit Sedge				

Shrubs					
Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Photinia floribunda</i>	Purple Chokeberry				
<i>Ilex verticillata</i>	Common Winterberry				
<i>Cornus florida</i>	Flowering Dogwood				
<i>Cornus serica</i>	Red Osier Dogwood				
<i>Prunus maritima</i>	Beach Plum				
<i>Cercis canadensis</i>	Eastern Redbud				

Reference source: State of Pennsylvania Conservation District(s)

Partial List of Plants for a Generic Rain Gardens

Wildflower					
Scientific Name	Common Name	height	soil	light	blooms
<i>Allium cernuum</i>	Nodding Pink Onion		dry		
<i>Amsonia ciliate</i>	Fringed Bluestar				apr-may
<i>Amsonia tabernaemontana</i>	Eastern Bluestar				
<i>Agastache foeniculum</i>	Giant Hyssop			sun	
<i>Anemone Canadensis</i>	Canada Anemone			sun	
<i>Aquilegia canadensis</i>	Wild Columbine		dry		mar-may
<i>Aquilegia vulgaris</i>	Common Columbine				
<i>Asclepias incarnata</i>	Marsh Milkweed	4 ft	moist	sun	jun-aug
<i>Aster laterflorus</i>	Side Flowering Aster				
<i>Aster novai-angliae</i>	New England Aster		moist	sun	
* <i>Aster novi-belgii</i>	New York Aster	4 ft	moist	sun	sep-oct
<i>Baptisa australis</i>	False Indigo		moist		may-jun
<i>Baptisa leucantha</i>	White Wild Indigo		dry		
<i>Boltonia asteroides</i>	White Doll's Daisy				
<i>Caltha palustris</i>	Marsh Marigold	2 ft	wet	sun	apr-jun
<i>Chelone glabra</i>	White Turtlehead	30 in	moist		jul-sep
<i>Chelone lyonii</i>	Pink Turtlehead	3 ft	moist		aug-oct
<i>Convallaria majalis</i>	Lily of the Valley	12 in	moist		apr-may
<i>Echinacea angustifolia</i>	Blacksamson Echinacea	30 in	moist	sun	jun-oct
<i>Echinacea moench</i>	Purple Coneflower				
<i>Equisetum hyemale</i>	Scouring Horsetail				
* <i>Eupatorium maculatum</i>	Joe-pye Weed	4 ft	moist	sun	jul-sep
<i>Eupatorium purpureum</i>	Purple Joe-pye Weed	4 ft	moist	sun	jul-sep
* <i>Eupatorium perfoliatum</i>	Boneset	4 ft	wet	sun	aug-sep
<i>Helianthus angustifolius</i>	Swamp Sunflower	4 ft	moist		aug-sep
<i>Hibiscus moscheutos</i>	Crimson-eyed Rosemallow	6 ft	moist		jun-sep
<i>Gentiana clausa</i>	Bottle Gentian	2 ft in	moist		sep-oct
<i>Gentiana saponica</i>	Soapwort Gentian	2 ft in	moist		sep-oct
* <i>Iris versicolor</i>	Harlequin Blueflag Iris	3 ft	moist	sun	may-jun
* <i>Itea virginica</i>	Virginia Sweetspire	8 ft	wet		may-jun
<i>Liatrius pycnostachya</i>	Thickspike Gayfeather				
<i>Lobelia cardinalis</i>	Cardinalflower	3 ft	wet	shade	jul-sep
<i>Lobelia syphilitica</i>	Great Blue Lobelia	2 ft	moist	sun	aug-sep
<i>Mentensia virginica</i>	Virginia Bluebells		wet		
<i>Monarda didyma</i>	Scarlet Beebalm	4 ft	moist		jul-sep
<i>Monarda fistulosa</i>	Wild Bergamot	3 ft	dry		jun-sep
<i>Penstemon digitalis</i>	Talus Slope Penstemon	4 ft	moist		may-jul

Generic cont.

Phlox paniculate	Fall Phlox	5 ft	wet		may-jul
Polymonium reptans	Jacob's Ladder	18 in	moist		apr-may
Rudbeckia fulgida	Orange Coneflower	2 ft	moist		jul-oct
* Rudbeckia hirta	Blackeyed Susan	3 ft	dry	sun	jul-oct
Rudbeckia lacianata	Cutleaf Coneflower	5 ft	moist		aug-oct
Rudbeckia subtomentosa	Sweet Coneflower	4 ft	wet		jul-oct
Sagittaria latifolia	Broadleaf Arrowhead	3 ft	wet		jul-sep
Solidage bicolor	Silver goldenrod	2 ft	dry		aug-oct
Solidago rigida	Stiff Goldenrod	4 ft	dry		aug-oct
Solidago rugosa	Wrinkleleaf Goldenrod				
Stylophorum diphyllum	Celendine Poppy	18 in	moist		mar-may
Talictum polygonum	Tall Meadow Rue			sun	
Tiarella cordifolia	Foam Flower			shade	
Typha augustifolia	Narrow-leaved Cattail				
Typha latifolia	Broad-leaved Cattail				
Veronicastrum virginicum	Culver's Root	4 ft	dry	sun	jun-sep
Vernonia noveboracensis	New York Ironweed				

Ferns					
Scientific Name	Common Name	height	soil	light	blooms
Athyrium filix-femina	Common Ladyfern				
Equisetum hyemale	Scouringrush Horsetail				
Onoclea sensibilis	Sensitive Fern		wet	shade	
Osmunda cinnamomea	Cinnamon Fern				
Osmunda regalis	Royal Fern			shade	

Grasses					
Scientific Name	Common Name	height	soil	light	blooms
Andropogon gerardii	Big Bluestem				
Briza media	Perennial Quakinggrass				
Chasmanthium latifolium	Indian Woodoats				
Elymus villosus	Silky Wild Rye				
Elymus virginicus	Virginia Wild Rye				
* Panicum vergatum	Switchgrass	3 ft	dry	sun	
Phalaris arundinacea	Reed Canarygrass				
Polypogon monspeliensis	Annual Rabbitsfoot				
Schizachyrium scoparium	Little Bluestem				
Sorghastrum nutans	Indian Grass				

Generic cont.

Reeds & Rush					
Scientific Name	Common Name	height	soil	light	blooms
* Juncus effuses	Common Rush	3 ft	wet	sun	

Sedges					
Scientific Name	Common Name	height	soil	light	blooms
Carex bromoides	Brome-like Sedge				
* Carex lurida	Shallow Sedge	4 in			
Carex pendula	Hanging Sedge				
Carex pennsylvanica	Pennsylvania Sedge				
Carex stipata	Owlfriut Sedge				
Carex stricta	Tussock Sedge			sun	

Shrubs					
Scientific Name	Common Name	height	soil	light	blooms
Amelanchier laevis	Shadbush				
Cephalanthus occidentalis	Buttonbush				
Cercis Canadensis	Eastern Redbud				
Clethra alnifolia	Sweet Pepperbush	6 ft	Wet		
Cornus amomum	Silky Dogwood				
Cornus florida	Flowering Dogwood				
Cornus sanguinea	Bloodtwig Dogwood				
Cornus sericea	Red Osier Dogwood	7 ft	Moist	Either	
Fothergilla gardenii	Dwarf Fothergilla				
Ilex glabra	Inkberry Holly				
Ilex verticillata	Common Winterberry				
Lindera benzoin	Spicebush				
Photinia floribunda	Purple Chokeberry				
Prunus maritime	Beach Plum				
Vaccinium corymbosum	Highbush Blueberry	8 ft	moist	sun	
Viburnum dentatum	Arrowwood	7 ft	moist		

Note: Scientific name preceded by an asterisk (*) are the native plants used for the construct of the Master Gardener's Rain Garden at the Burlington County Westampton complex.

Plants in the Master Gardener's Rain Garden at the Burlington County Complex in Westampton
[Rutgers Cooperative Extension 2 Academy Drive Westampton NJ 08060)

Scientific Name	Common Name	Height	Soil	Light	Blooms
<i>Aster novi-belgii</i>	New York Aster	3-5 ft	wet	sun	sep-oct
<i>Carex lurida</i>	Shallow Sedge	4-5 in	wet	sun	apr-may
<i>Clethra alnifolia</i>	Sweet Pepperbush	4-8 ft	wet	sun	jun-aug
<i>Cornus sericea</i>	Red Osier Dogwood	5-9 ft	moist	sun	apr-may
<i>Eupatorium maculatum</i>	Spotted Joe-Pye Weed	4 ft	wet	sun	jul-sep
<i>Eupatorium perfoliatum</i>	Boneset	2-5 ft	wet	sun	aug-oct
<i>Iris versicolor</i>	Harlequin Blue Flag Iris	2 to 4 ft	wet	sun	may-jul
<i>Itea virginica</i>	Virginia Sweetspire	3-9 ft	wet	sun	may-jun
<i>Juncus effusus</i>	Common Rush	2-4 ft	wet	sun	jun-aug
<i>Panicum virgatum</i>	Durham Switchgrass	3 ft	dry	sun	aug-sep
<i>Rudbeckia hirta</i>	Black Eyed Susan	2-3 ft	moist	sun	jul-oct
<i>Vaccinium corymbosum</i>	Highbush Blueberry	18-24 in	moist	sun	jun
<i>Viburnum dentatum</i>	Arrowwood Viburnum	5-9 ft	moist	sun	apr-may

Scientific Name	Common Name	type	Ref 1	Ref 2
<i>Aster novi-belgii</i>	New York Aster	Warm season perennial	Yes	Yes
<i>Carex lurida</i>	Shallow Sedge	sedge	Yes	No
<i>Clethra alnifolia</i>	Sweet Pepperbush	Flowering shrub	Yes	Yes
<i>Cornus sericea</i>	Red Osier Dogwood	Flowering shrub	No	No
<i>Eupatorium maculatum</i>	Spotted Joe-Pye Weed	Herbaceous wildflower	Yes	No
<i>Eupatorium perfoliatum</i>	Boneset	Perennial herb	Yes	No
<i>Iris versicolor</i>	Harlequin Blue Flag Iris	Monocot forb	Yes	No
<i>Itea virginica</i>	Virginia Sweetspire	Semi-evergreen willow	Yes	No
<i>Juncus effusus</i>	Common Rush	Perennial herb	Yes	No
<i>Panicum virgatum</i>	Durham Switchgrass	Warm season perennial	Yes	No
<i>Rudbeckia hirta</i>	Black Eyed Susan	Warm season biennial	No	No
<i>Vaccinium corymbosum</i>	Highbush Blueberry	Fruiting shrub	Yes	Yes
<i>Viburnum dentatum</i>	Arrowwood Viburnum	Flowering shrub	yes	No

Your recommendation for Rain Garden plants would be appreciated.

List of Suggested Plants for Medford Lakes and the Surrounding Area

[illegible]

Ferns					
Scientific Name	Common Name	Height	Soil	Light	Blooms

Recommended List cont.

Grasses					
Scientific Name	Common Name	Height	Soil	Light	Blooms

Sedges					
Scientific Name	Common Name	Height	Soil	Light	Blooms

Shrubs					
Scientific Name	Common Name	Height	Soil	Light	Blooms

You can leave your recommendation list at the Medford Lakes Borough Office care of
Mike Keating, ML Environmental Commission
Thank You

