TREE AND SHRUB INFORMATION FOR PENNSYLVANIA NRCS

The following tables are excerpted from: **A Guide to Conservation Plantings on Critical Areas for the Northeast**, by Paul R. Salon* (USDA-NRCS, Plant Materials Specialist, Syracuse New York) and Chris F. Miller (USDA-NRCS, Plant Materials Center Manager/Specialist, Cape May Court House, New Jersey).

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Appendix 2k. Tree Characteristics for Planning Conservation Plantings

Common Name[1]	Genus Species	Flood Tolerance	Shade Tolerance	Soil Drainage	Drought Tolerance	pH	Growth Rate	20 year Growth (feet)
Softwoods (Conifers)								
Cedar, Atlantic White	*Chamaecyparis thyoides*	3	3	VP-W	R	4.0-6.3	M	20
Cedar, Eastern Red	*Juniperus virginiana*	2	1	SPD-EX	R	4.7-8.0	SL	25
Cedar, Northern White (Arborvitae)	*Thuja occidentalis*	4	3	P-W	R	6.0-8.0	M-F	25
Hemlock, Eastern	*Tsuga canadensis*	1	5	P-W	S	4.6-6.5	SL-M	22
Larch (All-Tamaracks)	*Larix laricina*	5	1	VP-SPD	R	4.8-7.5	F	30
Pine, Eastern White	*Pinus strobus*	2	3	SPD-W	S	4.5-6.5	M	30
Pine, Jack	*Pinus banksiana*	1	1	W-EX	R	4.6-6.5	F	50
Pine, Pitch	*Pinus rigida*	1	1	W-EX	R	4.6-6.5	F	50
Pine, Red	*Pinus resinosa*	2	3	SPD-EX	S/R	4.6-6.5	M	30
Spruce, Black	*Picea mariana*	5	4	VP-SPD	R	4.6-6.5	SL	20
Spruce, Norway[2]	*Picea abies*	2	2	SPD-W	S/R	5.0-7.0	M-F	35
Spruce, White	*Picea glauca*	4	4	SPD-W	S/R	6.0-7.9	SL-M	30
Hardwoods								
American Hornbeam	*Carpinus caroliniana*	2	5	P-EX	S	6.1-7.5	SL	18
American Linden	*Tilia americana*	2	4	MW-W	S	6.5-7.5	M	60
American Plum	*Prunus americana*	1	2	MW-EX	R	6.6-7.5	F	24
Ash, Black	*Fraxinus nigra*	5	2	VP-SPD	R	4.6-6.5	F	20
Ash, Green	*Fraxinus pennsylvanica*	4	2	SPD-W	R	6.1-7.5	F	35
Ash, White	*Fraxinus americana*	3	4	SPD-W	S/R	6.1-7.5	M	40
Birch, River	*Betula nigra*	4	2	P-MW	R	4.5-6.5	F	35
Birch, Yellow	*Betula lutea*	2	4	P-W	S	4.5-8.0	M	10
Blackgum	*Nyssa sylvatica*	3	2	P-W	R	6.1-6.5	SL	50
Butternut	*Juglans cinerea*	3	2	MW-W	S/R	6.6-8.0	F	20
Cherry, Black	*Prunus serotina*	1	2	MW-W	R	6.1-7.5	F	40
Cherry, Pin	*Prunus pensylvanica*	1	1	MW-EX	R	6.1-7.5	F	25

Source: Adapted from Hightshoe, G. L. (1987). Native Trees, Shrubs and Vines for Urban and Rural America. New York: Van Nostrand Reinhold and the PLANTS Database.

Appendix 2k. Tree Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Mature Height (feet)	Longevity (years)	Soil Compaction	Rooting Type	Density	Salt Tolerance	Deer Resistance	Plant Hardiness Zone
Softwoods (Conifers)								
Cedar, Atlantic White	60	>200	R	TAP	D	S/R	VP	4a
Cedar, Eastern Red	50-75	>200	S	TAP	D	R	P	3a
Cedar, Northern White (Arborvitae)	50-75	>200	S	SHL	D	S/R	VP	2
Hemlock, Eastern	75-100	>200	S	SHL	D	S	VP	3b
Larch (All-Tamaracks)	50-75	100-200	R	SHL	O	R	UP	2
Pine, Eastern White	75-100	>200	S	DPL	M	S	VP	3b
Pine, Jack	50-75	<100	S	DPL	O	R	P	2
Pine, Pitch	50-75	<100	R	TAP	O	R	P	5a
Pine, Red	75-100	>200	S	DPL	M	S	UP-P	2
Spruce, Black	50-75	100-200	R	SHL	D	S	UP	2
Spruce, Norway[2]	100	100-200	S/R	SHL	D	S/R-S	UP	3a
Spruce, White	50-75	>200	S/R	SHL	D	S	UP	2
Hardwoods								
American Hornbeam	35-50	100-200	S	DPL	D	S	P	2
American Linden	75-100	100-200	S	DPL	D	S	P	3a
American Plum	20-35	<100	S	SHL	D	R	P	3a
Ash, Black	50-75	<100	R	SHL	M	S/R	P	2
Ash, Green	50-75	100-200	R	SHL	M	S/R	P	2
Ash, White	75-100	100-200	S/R	SHL	M	S/R	P	3b
Birch, River	50-75	<100	R	SHL	O	S	P	4a
Birch, Yellow	50-75	100-200	S	DPL	M	S/R	VP	3a
Blackgum	50-75	100-200	S/R	TAP	D	R	P-UP	5a
Butternut	50-75	<100	S/R	TAP	O	S	P	3b
Cherry, Black	80	100-200	S	DPL/TAP	O	R	P	3b
Cherry, Pin	20-35	<100	S	DPL	O	R	P	2

Appendix 2k. Tree Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Genus Species	Flood Tolerance	Shade Tolerance	Soil Drainage	Drought Tolerance	pH	Growth Rate	20 year Growth (feet)
Hardwoods (continued)								
Hackberry (common)	*Celtis occidentalis*	3	3	SPD-W	R	6.6-8.0	M	26
Hawthorn, Cockspur	*Crataegus crusgalli*	3	2	SPD-EX	R	6.1-8.0	SL	30
Hawthorn, Dotted	*Crataegus punctata*	3	2	SPD-EX	R	6.1-8.0	SL	20
Hickory, Bitternut	*Carya cordiformis*	3	3	MP-W	S/R	5.6-8.0	SL	30
Hickory, Mockernut	*Carya tomentosa*	1	2	MW-EX	R	6.1-6.5	SL	18
Hickory, Pignut	*Carya glabra*	1	3	MW-W	R	6.1-7.5	SL	30
Hickory, Shagbark	*Carya ovata*	2	3	SPD-W	R	6.1-6.5	SL	15
Maple, Red	*Acer rubrum*	4	4	VP-W	R	4.5-6.5	M-F	35
Maple, Silver	*Acer saccharinum*	4	3	P-W	R	5.5-6.5	F	45
Maple, Sugar	*Acer saccharum*	2	5	MW-W	S	6.0-7.5	SL	20
Mulberry, Red	*Morus rubra*	3	3	P-W	R	6.3-8.0	F	45
Locust, Black	*Robinia pseudoacacia*	1	5	MW-EX	R	5.1-7.7	F	40
Locust, Honey	*Gleditsia triacanthos*	3	1	SPD-W	R	6.1-7.5	F	35
Oak, Black	*Quercus velutina*	1	3	MW-EX	R	6.1-6.5	M	25
Oak, Black Jack	*Quercus marilandica*	1	2	MW-EX	R	4.6-5.0	SL	20
Oak, Bur	*Quercus macrocarpa*	3	2	SPD-W	R	4.6-8.0	SL	25
Oak, Chestnut	*Quercus prinus (montana)*	2	3	SPD-W	R	6.1-6.5	SL	25
Oak, Chinkapin	*Quercus muhlenbergi*	1	2	W-EX	R	6.6-8.0	SL	30
Oak, Northern Red	*Quercus rubra (borealis)*	2	4	MW-W	S/R	4.8-6.5	M	36
Oak, Pin	*Quercus palustris*	4	2	P-W	R	5.5-6.5	M-F	40
Oak, Post	*Quercus stellata*	1	2	SPD-W	R	4.6-6.5	SL	25
Oak, Scarlet	*Quercus coccinea*	1	2	MW-W	R	6.1-6.5	M-F	30
Oak, Swamp White	*Quercus bicolor*	4	3	VP-SPD	R	6.0-6.5	M-F	30
Oak, White	*Quercus alba*	2	3	MW-EX	S/R	6.1-7.5	SL	25
Ohio Buckeye	*Aesculus glabra*	3	3	SPD-W	S/R	6.1-6.5	SL	25

Appendix 2k. Tree Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Mature Height (feet)	Longevity (years)	Soil Compaction	Rooting Type	Density	Salt Tolerance	Deer Resistance	Plant Hardiness Zone
Hardwoods (continued)								
Hackberry (common)	60-80	>200	S/R	DPL	M	R	UP	3a
Hawthorn, Cockspur	20-35	<100	S/R	TAP	D	R	UP	4b
Hawthorn, Dotted	20-35	<100	S/R	TAP	D	S	UP-P	4b
Hickory, Bitternut	75-100	>200	S/R	TAP	M	S	UP	4a
Hickory, Mockernut	75-100	>200	S	TAP	O	S	VP	4a
Hickory, Pignut	75-100	>200	S	TAP	O	S	P	4a
Hickory, Shagbark	75-100	>200	S/R	TAP	O	S	UP	4a
Maple, Red	75-100	100-200	R	SHL	M	S	P	3a
Maple, Silver	75-125	<100	R	SHL	O	S/R	VP	3b
Maple, Sugar	75-100	100-200	S	SHL	D	S	VP	3a
Mulberry, Red	60	<75	S/R	TAP	D	R	VP	4a
Locust, Black	75	50-75	S	SHL	O	R	P	3b
Locust, Honey	50-75	100-125	R	DPL/SHL	O	R	UP	4b
Oak, Black	75-100	100-200	S	DPL/TAP	M-O	S/R	VP	4b
Oak, Black Jack	35-50	>200	S	TAP	M-D	R	UP-P	5b
Oak, Bur	75-100	>200	S	TAP	O	R	P	2
Oak, Chestnut	50-75	>200	S	TAP	M-O	S/R	P	5a
Oak, Chinkapin	35-50	>200	S	DPL	O	S/R	VP	4b
Oak, Northern Red	81	>200	S	DPL	O	R	VP	3a
Oak, Pin	50-75	100-200	R	SHL	M	S	P	3b
Oak, Post	35-50	>200	S	TAP	O	S	VP	5b
Oak, Scarlet	50-75	>200	S	TAP	M	S	VP	5a
Oak, Swamp White	75-100	100-200	R	SHL	M	S/R	P	4a
Oak, White	75-100	>200	S	TAP	M	R	P	3a
Ohio Buckeye	35-50	100-200	S/R	TAP	M	S	UP	4a

Appendix 2k. Tree Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Genus Species	Flood Tolerance	Shade Tolerance	Soil Drainage	Drought Tolerance	pH	Growth Rate	20 year Growth (feet)
Hardwoods (continued)								
Persimmon	*Diospyros virginiana*	3	2	MW-W	R	6.1-6.5	SL	25
Poplar, Eastern Cottonwood	*Populus deltoides*	4	2	P-EX	R	6.6-7.5	F	80
Poplar, Hybrid[2]	*Populus deltoides x P. nigra*	3	1	SPD-W	S	6.6-7.5	F	40
Poplar, Yellow (Tulip Poplar)	*Liriodendron tulipifera*	1	3	MW-W	S	6.1-6.5	M-F	50
Sassafras, Common	*Sassafras albidum*	1	2	W-EX	R	6.0-6.5	M	24
Sumac, Smooth	*Rhus glabra*	2	1	MW-EX	R	6.1-7.0	F	12
Sumac, Staghorn	*Rhus typhina*	2	1	MW-EX	R	6.1-7.0	F	30
Sycamore, American	*Platanus occidentalis*	3	3	P-W	R	6.6-8.0	F	65
Walnut, Black	*Juglans nigra*	3	2	MW-W	R	6.6-8.0	F	25
Willow, Black	*Salix nigra*	5	1	VP-SPD	R	6.5-8.0	F	50

Appendix 2k. Tree Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Mature Height (feet)	Longevity (years)	Soil Compaction	Rooting Type	Density	Salt Tolerance	Deer Resistance	Plant Hardiness Zone
Hardwoods (continued)								
Persimmon	50-75	50-75	S/R	TAP	O	S/R	S	5a
Poplar, Eastern Cottonwood	75-100	<100	R	SHL	O	R	P	3b
Poplar, Hybrid[2]	60	<40	S	SHL	D	S	VP	3
Poplar, Yellow (Tulip Poplar)	75-100	100-200	S	SHL/DPL	M	S	VP	5a
Sassafras, Common	75	<100	R	TAP	O	R	VP	5a
Sumac, Smooth	20-35	<100	S	SHL	O	R	UP	2
Sumac, Staghorn	35-50	<100	S	SHL	O	R	VP	3a
Sycamore, American	75-100	>200	R	SHL	O	S	UP	4a
Walnut, Black	75-100	>200	S/R	TAP	O	S	P	4b
Willow, Black	35-50	<100	R	SHL	O	S/R	P	3a

[1] Not all plants are native to the entire Northeast region or may be rare, refer to the Natural Heritage Botantist and Nature Serve Explorer website http://www.natureserve.org/explorer/, for state specific information.

[2] Introduced specie in United States; use only when native alternatives are not available, check for invasive status.

*Avoid planting species with current insect pest or disease vulnerability.

Source: Adapted from Hightshoe, G. L. (1987). Native Trees, Shrubs and Vines for Urban and Rural America. New York: Van Nostrand Reinhold, and the PLANTS Database.

Legend for Tree Characteristics

Flood Tolerance: 1 = very intolerant, 2 = intolerant, 3 = intermediate, 4 = tolerant, 5 = very tolerant

Shade Tolerance: 1 = very intolerant, 2 = intolerant, 3 = intermediate, 4 = tolerant, 5 = very tolerant

Soil Drainage: VP = very poor, P = Poor, SPD = somewhat poorly drained, MW = moderately well, W = well, EX = excessively

Drought tolerance: S = sensitive, S/R = intermediate, R = resistant

pH: Is the preferred range from 4.0 to 8.5 where 4.0 is very acid and 8.5 very alkaline, for some species wider tolerance ranges are listed in the PLANTS Database

Growth Rate: SL = slow, M = medium, F = fast

Soil Compaction: S = sensitive, S/R = intermediate, R = resistant

Root Type: SHL = shallow lateral, DPL = deep lateral, TAP = taproot

Density: D = dense, M = moderate, O = open

Salt Tolerance: S = sensitive, S/R = intermediate, R = resistant (rated for road salt tolerance)

Deer Palatability: VP = very palatable, P = palatable, UP = unpalatable

Plant Hardiness Zone (minimum)

Refer to Figure 1a in Chapter 1.

2	3a	3b	4a	4b	5a	5b	6
-50 to -40°F	-40 to -35°F	-35 to -30°F	-30 to -25°F	-25 to -20°F	-20 to -15°F	-15 to -10°F	-10 to 0°F

Appendix 2l. Shrub Characteristics for Planning Conservation Plantings

Common Name[1]	Genus Species	Soil Drainage	Drought Resistant	Growth Rate	Longevity	Soil Compaction	Rooting Type
American Black Currant	*Ribes americanum*	VP-W	S/R	M	VSH	R	SHL
Alder, Smooth	*Alnus serrulata*	VP-W	R	F	SH	R	SHL
Alder, Speckled	*Alnus incana*	VP-W	S	M	MOD	R	SHL
American Cranberrybush	*Viburnum opulus*	P-W	S	M	SH	R	SHL
American Plum	*Prunus americana*	MW-EX	R	F	L	S	SHL
Allegany Blackberry	*Rubus allegheniensis*	MW-EX	R	F	VSH	S/R	SHF
Amorpha, Indigobush	*Amorpha fruticosa*	VP-EX	R	M/F	VSH	R	SHL
Amorpha, leadplant	*Amorpha canescens*	W-EX	R	M	VSH	S	SHL
Beach Plum	*Prunus maritima*	SPD-EX	R	M	L	S/R	SHL
Bearberry	*Arctostaphylos uva-ursi*	W-EX	R	SL	L	S	SHL
Blueberry, Highbush	*Vaccinium corymbosum*	VP-W	S/R	SL	SH	R	SHL
Blueberry, Lowbush	*Vaccinium angustifolium*	W-EX	R	SL	SH	S	SHL
Bog Rosemary	*Andromeda polifolia*	VP-SPD	S	SL	MOD	R	SHL
Black Huckleberry	*Gaylussacia baccata*	MW-EX	S/R	S	L	S/R	SHL
Bush Honeysuckle	*Diervilla lonicera*	MW-EX	R	F	VSH	R	SHL
Buttonbush	*Cephalanthus occidentalis*	VP-W	S	M	SH	R	SHL
Canada Yew	*Taxus canadensis*	MW-W	S	SL	L	S	TAP
Cherry, Pin	*Prunus pensylvanica*	MW-EX	R	F	MOD	S	DPL
Cherry, Sand	*Prunus pumila var. depressa*	SPD-EX	R	SL	L	S/R	TAP
Chinkapin	*Castanea pumila*	W-EX	R	M	SH	S/R	SHL
Chokeberry, Black	*Aronia melanocarpa*	VP-EX	R	SL	SH	R	SHL
Chokeberry, Purplefruit	*Aronia prunifolia*	VP-W	S/R	SL	SH	R	SHL
Chokeberry, Red	*Aronia arbutifolia*	VP-W	S/R	SL	SH	R	SHL
Cinquefoil, Bush	*Potentilla fruticosa*	P-EX	R	M	VSH	R	SHL
Common Juniper	*Juniperus communis*	W-EX	R	SL	L	S	TAP

Appendix 2l. Shrub Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Moisture Tolerance	pH	Disease	Insect	Density	Shade Tolerance	Mature Height (feet)	Salt Spray Tolerance	Plant Hardiness Zone
American Black Currant	W-AV	6.1-7.5	OC	OC	M	3	6	S	3a
Alder, Smooth	W-M	5.5-7.5	OC	OC	O	1	30	S	5a
Alder, Speckled	M	4.8-7.7	OC	OC	M	3	20	S	3a
American Cranberrybush	W-M	6.5-7.2	INFREQ	INFREQ	M	1	12	S	3b
American Plum	AV-VD	6.6-7.5	INFREQ	INFREQ	D	2	35	S/R	3a
Allegany Blackberry	AV-DR	4.5-7.5	OC	INFREQ	O	4	6	S	3b
Amorpha, Indigobush	W-VD	6.1-8.5	OC	OC	O	2	20	R	3a
Amorpha, leadplant	AV-VD	7.0-8.5	INFREQ	INFREQ	O	1	6	R	3a
Beach Plum	W-VD	5.8-7.7	INFREQ	INFREQ	M	1	12	S/R-S	3b
Bearberry	AV-VD	4.5-6.0	INFREQ	INFREQ	D	2	0.5	R	2
Blueberry, Highbush	W-DRY	3.5-6.0	OC	OC	D	4	12	R	4b
Blueberry, Lowbush	M-VD	4.0-6.0	OC	OC	O	4	1	R	2
Bog Rosemary	W-M	4.0-6.0	INFREQ	INFREQ	O	4	0.5	R	2
Black Huckleberry	W-M	4.5-6.5	INFREQ	INFREQ	D	4	4	S	3b
Bush Honeysuckle	AV-VD	6.1-6.5	INFREQ	OC	O	1	3	S	3a
Buttonbush	W-M	6.1-8.5	INFREQ	INFREQ	O	1	20	R	4a
Canada Yew	M	5.1-7.5	INFREQ	INFREQ	O	5	6	R	2
Cherry, Pin	M-AV	6.1-7.5	FREQ	FREQ	O	1	35	R	2
Cherry, Sand	AV-DRY	5.9-7.0	INFREQ	INFREQ	M-D	1	2	S	3a
Chinkapin	AV-VD	4.5-6.8	FREQ	INFREQ	D	3	25	S	5b
Chokeberry, Black	W-VD	5.1-6.5	INFREQ	INFREQ	M-O	3	6	R	3a
Chokeberry, Purplefruit	W-DRY	5.1-6.5	INFREQ	INFREQ	M	3	12	R	4a
Chokeberry, Red	W-DRY	5.1-6.5	INFREQ	INFREQ	M	3	12	R	4b
Cinquefoil, Bush	W-VD	5.0-8.5	INFREQ	INFREQ	D	1	4	R	2
Common Juniper	AV-VD	5.0-8.5	FREQ	OC	D	1	8	S/R	2

Appendix 2l. Shrub Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Genus Species	Soil Drainage	Drought Resistant	Growth Rate	Longevity	Soil Compaction	Rooting Type
Cranberry	*Vaccinium macrocarpon*	VP-SPD	S	SL	MOD	R	SHL
Dogwood, Alternate-leaf	*Cornus alternifolia*	SPD-W	S	SL	MOD	S/R	SHF
Dogwood, Flowering	*Cornus florida*	P-W	3	M	MOD	S	DPL
Dogwood, Gray	*Cornus racemosa*	MP-EX	R	M	SH	S/R	SHL
Dogwood, Redosier	*Cornus stolonifera*	VP-W	R	F	SH	R	SHL
Dogwood, Silky	*Cornus amomum*	VP-W	S/R	F	SH	R	SHL
Eastern Baccharis	*Baccharis halmifolia*	VP-EX	R	F	MOD	R	SHL
Elderberry	*Sambucus canadensis*	VP-EX	R	F	VSH	R	SHL/STO
Filbert, American (hazelnut)	*Corylus americana*	MW-EX	S/R	M/F	MOD	S/R	SHL
Filbert, Beaked	*Corylus cornuta*	MW-EX	S/R	M	MOD	S/R	SHL
Hawthorn, Cockspur	*Crataegus crusgalli*	SPD-W	R	SL	MOD	S/R	TAP
Hawthorn, Dotted	*Crataegus punctata*	SPD-W	R	SL	MOD	S/R	TAP
Hightide Bush, Marsh Elder	*Iva frutescens*	SPD-MW	S	M	L	S/R	SHL
Horn Beam	*Carpinus caroliniana*	P-W	S	SL	MOD	S	DPL
Inkberry	*Ilex glabra*	VP-W	S	SL	L	R	SHL
Leatherleaf	*Chamaedaphne calyculata*	VP-SPD	S	SL	SH	R	SHL
Low Birch	*Betula pumila*	VP-SPD	S/R	M/F	VSH	R	SHL
Maleberry	*Lyonia ligustrina*	VP-SPD	R	M	MOD	R	SHL
New Jersey Tea	*Ceanothus americanus*	W-EX	R	SL	VSH	S	SHL
Ninebark	*Physocarpus opulifolius*	VP-EX	R	F	MOD	R	SHL
Northern Bayberry	*Myrica pensylvanica*	VP-EX	R	M	MOD	R	DPL/SHL
Oak, Dwarf Chinkapin	*Quercus prinoides*	W-EX	R	SL	L	S	DPL
Oak, Scrub	*Quercus ilicifolia*	W-EX	R	M	L	S	DPL
Pasture Gooseberry	*Ribes cynosbati*	SPD-EX	R	M/F	VSH	S/R	SHL
Rose, Carolina	*Rosa carolina*	P-EX	R	F	SH	S/R	SHL
Rose, Prairie	*Rosa setigera*	SPD-EX	R	F	SH	S/R	SHL

Appendix 2l. Shrub Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Moisture Tolerance	pH	Disease	Insect	Density	Shade Tolerance	Mature Height (feet)	Salt Spray Tolerance	Plant Hardiness Zone
Cranberry	W	4.0-6.0	OC	OC	O	4	1	R	3a
Dogwood, Alternate-leaf	M-AV	4.8-7.3	INFREQ	INFREQ	O	5	25	S	2
Dogwood, Flowering	M-DRY	4.8-7.7	INFREQ	INFREQ	M	5	30	S	4a
Dogwood, Gray	M-VD	6.1-8.5	INFREQ	INFREQ	D	4	12	S	3a
Dogwood, Redosier	W-AV	6.1-8.5	OC	OC	M	1	12	S	2
Dogwood, Silky	W-AV	6.1-8.5	OC	INFREQ	M	4	12	S	4a
Eastern Baccharis	W-VD	7.0-8.5	INFREQ	INFREQ	O	1	12	R*	4a
Elderberry	W-DRY	6.1-7.5	OC	INFREQ	O	5	12	S	3a
Filbert, American (hazelnut)	M-VD	6.1-7.5	INFREQ	INFREQ	D	4	12	S	3a
Filbert, Beaked	M-VD	6.1-7.5	INFREQ	INFREQ	D	4	12	S	3a
Hawthorn, Cockspur	W-VD	6.1-8.0	FREQ	FREQ	VD	2	35	S	4b
Hawthorn, Dotted	W-AV	6.1-8.0	FREQ	FREQ	VD	2	35	S	4b
Hightide Bush, Marsh Elder	W-AV	5.0-7.5	INFREQ	INFREQ	D	1	9	R*	5b
Horn Beam	M-AV	6.1-7.5	INFREQ	INFREQ	VD	5	50	S	2
Inkberry	W-M	4.5-6.0	INFREQ	INFREQ	O	4	9	R*	4a
Leatherleaf	W-M	4.5-6.0	INFREQ	INFREQ	D	2	3	S/R-S	2
Low Birch	W-M	5.1-8.5	OC	FREQ	O	1	20	S/R	2
Maleberry	W-M	4.0-6.0	INFREQ	INFREQ	O	1	12	R	5b
New Jersey Tea	AV-VD	4.5-6.0	INFREQ	INFREQ	D	3	3	R	3b
Ninebark	W-VD	4.5-8.1	INFREQ	INFREQ	D	2	12	S/R	2
Northern Bayberry	W-VD	5.0-6.5	INFREQ	INFREQ	M	3	12	R*	4b
Oak, Dwarf Chinkapin	DRY-VD	5.1-8.5	OC	OC	O	2	12	R	5b
Oak, Scrub	DRY-VD	4.0-7.5	OC	OC	D	1	20	R	5b
Pasture Gooseberry	M-VD	6.1-8.5	OC	OC	D	5	6	S	2
Rose, Carolina	W-VD	6.1-8.5	OC	OC	D	2	4	R	4b
Rose, Prairie	M-VD	6.1-8.5	OC	OC	D	2	12	S	4b

Appendix 2l. Shrub Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Genus Species	Soil Drainage	Drought Resistant	Growth Rate	Longevity	Soil Compaction	Rooting Type
Rose, Rugosa[2]	*Rosa rugosa*	SPD-W	S/R	M	L	S/R	SHL
Rose, Swamp	*Rosa palustris*	SPD-MW	S	M	L	S/R	RHZ
Rose, Virginia	*Rosa virginiana*	M-W	R	M	MOD	S/R	SHL
Serviceberry, Allegany	*Amelanchier laevis*	W-MW	S	M	MOD	S	SHF
Serviceberry, Roundleaf	*Amelanchier sanguinea*	W-EX	R	M	SH	S	SHL
Serviceberry, Shadblow	*Amelanchier canadensis*	W-MW	S	M	MOD	S	SHF
Snowberry (common)	*Symphoricarpos albus*	MW-W	S/R	F	VSH	S/R	SHL
Spicebush (northern)	*Lindera benzoin*	MP-W	S	SL	MOD	S/R	DPL
Spirea, Hardhack	*Spirea tomentosa*	VP-SPD	R	F	VSH	R	SHL
Spirea, Meadowsweet	*Spiraea alba*	VP-SPD	R	F	VSH	R	SHL
Sumac, Fragrant	*Rhus aromatica*	W-EX	R	SL/M	SH	S	SHL
Sumac, Smooth	*Rhus glabra*	MW-EX	R	F	SH	S	SHL
Sumac, Staghorn	*Rhus typhina*	MW-EX	R	F	MOD	S	SHL
Sumac, Winged	*Rhus copallinum*	VP-SPD	R	M	MOD	R	SHL
Summersweet	*Clethra alnifolia*	VP-MW	S/R	SL/M	SH	R	SHL
Sweetfern	*Comptonia peregrina*	W-EX	R	SL	MOD	S	SHL
Viburnum[3], American Cranberrybush	*Virburnum opulus*	VP-W	R	M/L	MOD	R	SHL
Viburnum[3], Arrowwood	*Viburnum dentatum*	P-W	R	M	SH	S/R	SHL
Viburnum[3], Hobblebush	*Viburnum lantanoides*	MW-W	S	M	SH	S/R	SHL
Viburnum[3], Nannyberry	*Viburnum lentago*	SPD-W	S	SL	L	R	SHL
Viburnum[3], Mapleleaf	*Viburnum acerifolium*	SPD-W	S/R	SL/M	SH	S/R	SHL
Viburnum[3], Wild raisin	*Viburnum nudum*	VP-W	R	M	MOD	R	SHL
Viburnum[3], Witherod	*Viburnum cassinoides*	VP-W	S/R	M	MOD	R	SHL
Willow, 'Bankers' Dwarf[2]	*Salix x cottetii*	VP-MW	S	F	MOD	R	SHL
Willow, Bebbs	*Salix bebbianna*	VP-W	S	F	MOD	R	SHL

Appendix 2I. Shrub Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Moisture Tolerance	pH	Disease	Insect	Density	Shade Tolerance	Mature Height (feet)	Salt Spray Tolerance	Plant Hardiness Zone
Rose, Rugosa[2]	AV-DRY	5.5-7.5	OC	OC	D	1	5	R*	3b
Rose, Swamp	W-AV	4.0-7.0	FREQ	FREQ	O	5	8	R	3b
Rose, Virginia	M-AV	5.0-7.0	OC	OC	D	3	6	R	5a
Serviceberry, Allegany	M-AV	6.1-6.5	INFREQ	INFREQ	D	5	35	S	3a
Serviceberry, Roundleaf	AV-DRY	6.1-8.5	OC	OC	O	5	6	S	5a
Serviceberry, Shadblow	M-AV	6.1-6.5	INFREQ	INFREQ	D	5	45	R	3a
Snowberry (common)	M-DRY	6.1-8.5	FREQ	OC	D	2	6	R	2
Spicebush (northern)	W-AV	4.5-6.5	INFREQ	INFREQ	M	5	12	R	5a
Spirea, Hardhack	W-AV	5.1-6.0	OC	OC	O	2	6	S	4a
Spirea, Meadowsweet	W-M	6.6-7.5	OC	OC	D	2	6	S	3a
Sumac, Fragrant	AV-VD	6.1-8.5	OC	OC	D	1	12	R	4a
Sumac, Smooth	M-VD	6.1-7.0	INFREQ	INFREQ	O	1	20	R	2
Sumac, Staghorn	M-VD	6.1-7.0	INFREQ	INFREQ	O	1	50	R	3a
Sumac, Winged	W-VD	5.3-7.5	INFREQ	INFREQ	M	1	35	R	4a
Summersweet	W-M	4.5-6.5	INFREQ	INFREQ	O	4	12	R	4a
Sweetfern	DRY-VD	4.5-6.5	INFREQ	INFREQ	O	4	3	R	2
Viburnum[3], American Cranberrybush	W-AV	6.6-7.5	INFREQ	FREQ	D	5	16	S	2
Viburnum[3], Arrowwood	W-AV	5.1-6.5	INFREQ	FREQ	M-D	4	12	R	3a
Viburnum[3], Hobblebush	M-AV	5.5-6.5	OC	FREQ	O	5	12	S	3b
Viburnum[3], Nannyberry	W-AV	5.0-7.0	OC	FREQ	D	5	28	S/R-S	3b
Viburnum[3], Mapleleaf	M-DRY	5.1-6.0	OC	FREQ	D	5	6	S	3b
Viburnum[3], Wild raisin	W-AV	5.1-6.0	INFREQ	FREQ	M	4	20	S	6a
Viburnum[3], Witherod	W-DRY	5.1-6.5	INFREQ	FREQ	D	4	12	R*	2
Willow, 'Bankers' Dwarf[2]	W-M	5.5-7.5	INFREQ	INFREQ	D	3	5	S	4a
Willow, Bebbs	W-AV	5.5-7.5	INFREQ	INFREQ	M	1	35	R	2

Appendix 2I. Shrub Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Genus Species	Soil Drainage	Drought Resistant	Growth Rate	Longevity	Soil Compaction	Rooting Type
Willow, Heart Leaved	*Salix eriocephala*	MW-W	S	F	MOD	S/R	SHL
Willow, Prairie	*Salix humilis*	VP-EX	R	SL/M	SH	R	SHL
Willow, Pussy	*Salix discolor*	VP-SPD	R	SL	SH	R	SHL
Willow, Purple osier[2]	*Salix purpurea*	VP-W	S/R	F	L	S/R	SHL
Willow, Sandbar	*Salix exigua*	VP-W	S/R	F	MOD	S/R	SHL/RHZ
Willow, Shining	*Salix lucida*	VP-SPD	R	F	SH	R	SHL
Willow, Silky	*Salix sericea*	VP-W	S	F	MOD	R	SHL
Willow, Slender	*Salix petiolaris*	VP-W	S	F	MOD	R	SHL
Winterberry (common)	*Ilex verticillata*	VP-MW	S/R	SL	MOD	R	SHL
Witch Hazel	*Hamamelis virginiana*	VP-W	R	S	L	R	DPL

Appendix 2I. Shrub Characteristics for Planning Conservation Plantings (continued)

Common Name[1]	Moisture Tolerance	pH	Disease	Insect	Density	Shade Tolerance	Mature Height (feet)	Salt Spray Tolerance	Plant Hardiness Zone
Willow, Heart Leaved	W-AV	4.0-7.0	FREQ	FREQ	M	4	40	S	3a
Willow, Prairie	W-D	6.1-7.5	OC	OC	O	1	12	R	3a
Willow, Pussy	W-M	4.0-7.0	FREQ	FREQ	M	1	20	R	2
Willow, Purple osier[2]	W-DRY	5.5-7.5	OC	OC	D		16	S/R-S	3a
Willow, Sandbar	W-dry	6.0-8.5	OC	OC	D	3	16	S/R-S	3a
Willow, Shining	W-M	6.1-7.5	OC	OC	O	1	20	R	2
Willow, Silky	W-M	5.2-7.0	OC	OC	D	1	12	S	4a
Willow, Slender	W-M	5.2-7.0	OC	OC	M	3	10	R	2
Winterberry (common)	W-M	4.5-8.0	INFREQ	INFREQ	D	3	12	S	3b
Witch Hazel	W-DRY	4.5-7.0	INFREQ	INFREQ	D	4	18	S/R	4a

[1] Not all plants are native to the entire Northeast region or may be rare, refer to the Natural Heritage Botantist and Nature Serve Explorer website http://www.natureserve.org/explorer/, for state specific information.

[2] Introduced specie to United States; use only when native alternatives are not available, check for invasive status.

[3] For all viburnums, the viburnum leaf beetle can be a problem and should not be planted until this issue is resolved.

Adapted from Hightshoe, G. L. (1987). Native Trees, Shrubs and Vines for Urban and Rural America. New York: Van Nostrand Reinhold, 1987, and the PLANTS Database.

Legend for Shrub Characteristics

Soil Drainage: VP = very poor, P = Poor, SPD = somewhat poorly drained, MW=moderately well, W=well, EX = excessively well

Drought Resistant: R = resistant, S/R = intermediate, S = susceptible

Growth Rate: SL- slow, M = medium, F = fast

Longevity: VSH = very short, SH=short, MOD = moderate, L = long, VL = very long

Soil Compaction: R = resistant, S/R = intermediate, S = susceptible

Rooting Type: SHL = shallow lateral, SHF = shallow fibrous, DPL = deep lateral, TAP = taproot, STO = stoloniferous, RHZ = rhizomatous

Moisture Tolerance: W = wet, M = moist, AV = average, DRY = dry, VD = droughty

Disease: FREQ = frequently, OC = occasionally, INFREQ = infrequently

Insects: FREQ = frequently, OC = occasionally, INFREQ = infrequently

Density (Summer foliage): D = dense, M = moderate, O = open

Shade Tolerance: 1 = very intolerant, 2 = intolerant, 3 = intermediate, 4 = tolerant, 5 = very tolerant

Salt Tolerance: R = resistant, S/R = intermediate, S = susceptible (rated for road salt tolerance) R* = coastal application

Plant Hardiness Zone (minimum)

Refer to Figure 1a in Chapter 1.

2	3a	3b	4a	4b	5a	5b	6
-50 to -40°F	-40 to -35°F	-35 to -30°F	-30 to -25°F	-25 to -20°F	-20 to -15°F	-15 to -10°F	-10 to 0°F

Appendix 3c. Northeast Shrubs Suitable for Soil Bioengineering Systems

Common Name	Genus/Species	Habitat[1]	Plant Hardiness Zone[2]	Bank Zone[3]	Plant Material Form[4]
Smooth alder	*Alnus serrulata*	nontidal	4 to 7	toe	seedling
False indigo	*Amorpha fruticosa*	Nontidal, tidal fresh	4 to 7	lower-mid	rooted unrooted
Chokeberry, red	*Aronia arbutifolia*	nontidal	4 to 7	lower-mid	seedling
Chokeberry, Black	*Aronia melanocarpa*	nontidal	4 to 7	mid-upper	seedling
Groundsel bush	*Baccharis halimifolia*	tidal, tidal fresh	6 to 7	mid-upper	rooted, (unrooted)
Buttonbush	*Cephalanthus occidentalis*	nontidal, tidal fresh	3b to 7	toe	rooted, (unrooted)
Sweet pepperbush	*Celthra alnifolia*	tidal, tidal fresh	6 to 7	mid-upper	rooted
Dogwood, silky 'indigo'	*Cornus amomum*	streambanks, pond edges	4 to 7	lower-mid	rooted, (unrooted)
Dogwood, gray	*Cornus racemosa*	streambanks, pond edges	2 to 7	lower-mid	seedling
Dogwood, redosier 'Ruby'	*Corus serecia*	streambanks, pond edges	2 to 7	toe-mid	rooted unrooted
Possum haw	*Ilex decidua*	forested wetlands, pond edges	6 to 7	lower-mid	rooted
Inkberry	*Ilex glabra*	forested wetlands, sandy woods	4 to 7	mid-upper	rooted
Winterberry holly	*Ilex verticillata*	tidal fresh, for-ested wetlands	3b to 7	lower-mid	rooted
Virginia sweetspire	*Itea virginica*	forested wetlands, streambanks	6 to 7	toe	rooted
Hightide bush	*Iva frutescens*	tidal brackish	6 to 7	lower	rooted, (unrooted)
Leucothoe/swamp doghobble	*Leucothoe/Eubotrys racemosa*	forested wetland, moist woods	6 to 7	lower-mid	seedling
Spicebush	*Lindera benzoin*	seasonal wet-lands, floodplain	5 to 7	lower-mid	rooted
Maleberry	*Lyonia ligustrina*	open woods	5 to 7	lower-mid	rooted
Sweetbay magnolia	*Magnolia virginiana*	stream borders, for wetland	6 to 7	lower-mid	rooted
Wax myrtle	*Myrica cerifera*	tidal fresh, brackish swales	6 to 7	mid-upper	rooted
Bayberry	*Morella pensylvanica*	tidal fresh, brackish nontidal	4b to 7	mid-upper	seedling
Ninebark	*Physocarpus opulifolius*	streamsides, wood edges	3 to 7	low-mid	rooted unrooted
Cherry, dwarf sand 'Catskill'	*Prunus pumila var. depressa*	streamside, sandbars	3b to 7	mid-upper	rooted
Swamp azalea	*Rhododendron viscosum*	forested wetland	5b to 7	toe-low	rooted

Appendix 3c. Northeast Shrubs Suitable for Soil Bioengineering Systems (continued)

Common Name	Shade Tolerance[5]	Flood Tolerance[6]	pH range	Comments
Smooth alder	medium	regular	5.5-7.5	Nitrogen fixer, weak wooded
False indigo	low	seasonal	5.9-8.5	Requires full sun, drought tolerant
Chokeberry, red	medium	irregular-seasonal	5.1-6.5	Drought tolerant
Chokeberry, Black	low	irregular-seasonal	5.1-6.5	Drought tolerant
Groundsel bush	high	seasonal	7.0-8.5	Male/Female separate plants
Buttonbush	high	permanent	6.0-8.5	Tolerates some drought
Sweet pepperbush	high	seasonal	4.5-6.5	Some salt tolerance, drought tolerant
Dogwood, silky 'indigo'	medium	seasonal	5.5-8.5	Drought tolerant
Dogwood, gray	high	seasonal	5.5-8-5	Drought tolerant
Dogwood, redosier 'Ruby'	medium	regular-seasonal	5.5-8.5	Drought tolerant
Possum haw	high	irregular	4.0-6.0	Male/Female separate plants
Inkberry	high	irregular	4.5-6.0	Male/Female separate plants plants, resists salt spray
Winterberry holly	high	seasonal	4.5-8.0	Drought tolerant
Virginia sweetspire	high	regular	5.0-7.0	Some salt tolerance
Hightide bush	low	regular	6.0-7.5	Highly tolerant of salt, to 15 ppt salt, seawater is 35 ppt
Leucothoe/swamp doghobble	high	regular	5.0-6.0	Tolerates some drought
Spicebush	high	seasonal	4.5-6.5	Tolerates some drought
Maleberry	low	seasonal	4.0-6.0	Acid tolerant
Sweetbay magnolia	high	irregular-seasonal	4.0-6.5	Some salt tolerance
Wax myrtle	high	regular	4.0-6.0	Highly tolerant of salt to 10 ppt salt. N-fixing
Bayberry	high	irregular-seasonal	5.0-6.5	Tolerates drought, N-fixing
Ninebark	medium	seasonal	4.5-8.1	
Cherry, dwarf sand 'Catskill'	low	irregular-seasonal	5.5-8.5	Drought tolerant
Swamp azalea	medium	regular-seasonal	4.0-6.0	Susceptible to disease

Appendix 3c. Northeast Shrubs Suitable for Soil Bioengineering Systems (continued)

Common Name	Genus/Species	Habitat[1]	Plant Hardiness Zone[2]	Bank Zone[3]	Plant Material Form[4]
Swamp rose	*Rosa palustris*	tidal fresh for wetland streambank	3b to 7	toe-low	rooted
Staghorn/Smooth sumac	*Rhus typhina/glabra*	disturbed banks/ dry sites	3b to 7	upper	rooted
Willow, dwarf 'Bankers'	*Salix X cottetii*	streambank	4 to 7	toe-mid	unrooted, rooted
Willow, pussy	*Salix discolor*	streambank forested wetland	3b to 7	toe-mid	unrooted, rooted
Willow sandbar, 'Greenbank'	*Salix exigua*	streambank sandbars	3 to 7	toe	unrooted, rooted
Willow purpleosier, 'Streamco'	*Salix purpurea*	streambank	3b to 7	toe-upper	unrooted, rooted
Elderberry	*Sambucus canadensis*	tidal fresh, nontidal, wet meadow	3 to 7	low-mid	rooted unrooted
Meadowsweet	*Spirea alba/tomentosa*	forested wetland	4 to 7	mid-upper	rooted
Viburnum, Southern arrowwood	*Viburnum dentatum*	tidal fresh, nontidal, forest wetland	3 to 7	mid-upper	rooted, (unrooted)
Viburnum, Nannyberry	*Vibrurnum lentago*	forested wetland	4 to 7	mid-upper	rooted, (unrooted)
Viburnum, blackhaw	*Viburnum prunifolium*	forested wetland	5 to 7	upper	rooted, (unrooted)
Viburnum, American cranberrybush	*Viburnum trilobum*	forested wetland	2 to 7	lower-mid	rooted, (unrooted)

Appendix 3c. Northeast Shrubs Suitable for Soil Bioengineering Systems (continued)

Common Name	Shade Tolerance[5]	Flood Tolerance[6]	pH range	Comments
Swamp rose	low	seasonal-regular	4.0-7.0	Prefers full sun
Staghorn/Smooth sumac	low	irregular	6.1-7.0	Tolerates some drought
Willow, dwarf 'Bankers'	medium	regular-permanent	5.0-7.5	Introduced male hybrid
Willow, pussy	medium	regular-permanent	5.0-7.5	Attractive landscaping plant
Willow sandbar, 'Greenbank'	low	regular-permanent	5.0-7.5	Aggressive root suckering, some salt tolerance
Willow purpleosier, 'Streamco'	medium	regular-permanent	6.0-7.0	Introduced male hybrid
Elderberry	high	irregular-seasonal	5.5-8.0	Some salt tolerance, drought tolerant
Meadowsweet	low	irregular	5.1-6.0	Drought tolerant
Viburnum, Southern arrowwood	medium	seasonal	5.1-7.0	Drought tolerant
Viburnum, Nannyberry	medium	seasonal	6.0-7.0	Forms dense thickets
Viburnum, blackhaw	medium	irregular	4.8-7.5	
Viburnum, American cranberrybush	low	irregular-seasonal	5.5-7.5	Drought tolerant

[1] Habitat is the natural environmental site conditions where the plant is found: Nontidal - freshwater ponds, lakes, streams, and rivers not tidally influenced
Tidal fresh - upper reaches of tidally influenced rivers and streams where salinity is extremely low ranging from 0.5 ppt -1 ppt Brackish - occurs in salinities ranging from 1 ppt-15 ppt
Streambanks - freshwater streams
Forested wetlands - freshwater wetlands occurring in a forest understory

[2] Plant Hardiness zone: is referenced from 2 to 7

[3] Bank Zone: Recommended planting location on the bank slope: toe, low, mid, upper

[4] Plant Material Form:
rooted – a bare root (1-0 or 2-0) seedling or containerized
unrooted – good to excellent rooting from a dormant hardwood cutting (unrooted) – fair to poor success from a dormant hardwood cutting

[5] Shade Tolerance: The relative value in relation to other species. A shade tolerant species may prefer partial shade to full sun

[6] Flood Tolerance:
Permanent to semipermanent: tolerates inundation or saturation from 76% - 100% of the growing season Regularly: tolerates in inundation or saturation from 26% - 75% of the growing season; Seasonally: tolerates inundation or saturation from 13% - 25% of the growing season; Irregularly: tolerates inundation/saturation from 5% - 12% of growing season