

STANDARD AND SPECIFICATIONS FOR RECREATION AREA IMPROVEMENT



Definition

Establishing grasses, legumes, vines, shrubs, trees, or other plants, or selectively reducing stand density and trimming woody plants, to improve an area for recreation.

Purpose

To increase the attractiveness and usefulness of recreation areas and to protect the soil and plant resources.

Conditions Where Practice Applies

On any area planned for recreation use, lawns, and areas that will be maintained in a closely mowed condition.

Specifications

ESTABLISHING GRASSES (Turfgrass)

The following applies for playgrounds, parks, athletic fields, camping areas, picnic areas, passive recreation areas such as lawns, and similar areas.

1. Time of Planting

Fall planting is preferred. Seed after August 15. In the spring, plant until May 15.

If seeding is done between May 15 and August 15, irrigation may be necessary to ensure a successful seeding.

2. Site Preparation

- A. Install needed water and erosion control measures and bring area to be seeded to desired grades. A minimum of 4 in. topsoil is required.
- B. See Standard and Specification of Topsoiling.

- C. Prepare seedbed by loosening soil to a depth of 4-6 inches.
- D. Lime to a pH of 6.5.
- E. **Fertilize as per soil test** or, if soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply commercial fertilizer at 850 pounds of 5-10-10 or equivalent per acre (20 lbs/1,000 sq. ft.)
- F. Incorporate lime and fertilizer in top 2-4 inches of topsoil.
- G. Smooth. Remove sticks, foreign matter, and stones over 1 inch in diameter, from the surface. Firm the seedbed.

3. Planting

Use a cultipacker type seeder if possible. Seed to a depth of 1/8 to 1/4 inch. If seed is to be broadcast, cultipack or roll after seeding. If hyroseeded, lime and fertilizer may be applied through the seeder, and rolling is not practical.

4. Mulching

Mulch all seedings in accordance with Standard and Specifications for Mulching. Small grain straw is the best material.

5. Seed Mixtures

Select seed mixture for site conditions and intended use from Table 3.2.

6. Contact Cornell Cooperative Extension Turf Specialist for suitable varieties.

When Kentucky bluegrass is used, it is desirable to use two or more varieties in the seeding for disease resistance.

Turf-type tall fescues have replaced the old KY31 tall fescues. New varieties have finer leaves and are the most resistant grass to foot traffic. Do not mix it with fine textured grasses such as bluegrass and red fescue.

Common ryegrass and redtop, which are relatively short lived species, provide quick green cover. Improved lawn cultivars of perennial ryegrass provide excellent quality turf, but continue to lack winter hardiness.

Common white clover can be added to mixtures at the rate of 1-2 lbs/acre to help maintain green color during the dry summer period; however, they will not withstand heavy traffic. Avoid using around swimming areas as flowers attract bees which can be easily stepped on.

Table 3.2 Recreation Turfgrass Seed Mixture

Site - Use	Species (% by weight)	lbs/1,000 sq. ft.	lbs./acre
1. Sunny sites (well, moderately well, and somewhat poorly drained soils)			
a. Athletic fields and similar areas			
	80% Kentucky bluegrass blend.....	2.4-3.2	105-138
	20% perennial ryegrass.....	<u>0.6-0.8</u>	<u>25-37</u>
	<u>OR</u>	3.0-4.0	130-175
	(for southern and eastern NY)		
	50% Kentucky bluegrass.....	1.5-2.0	65-88
	50% perennial ryegrass.....	<u>1.5-2.0</u>	<u>65-87</u>
	<u>OR</u>	3.0-4.0	130-175
	100% Tall fescue, Turf-type, fine leaf.....	3.4-4.6	150-200
b. General recreation areas and lawns (Medium to high maintenance)			
	65% Kentucky bluegrass blend.....	2.0-2.6	85-114
	20% perennial ryegrass.....	0.6-0.8	26-35
	15% fine fescue.....	<u>0.4-0.6</u>	<u>19-26</u>
	<u>OR</u>	3.0-4.0	130-175
	100% Tall fescue, Turf-type, fine leaf.....	3.4-4.6	150-200
2. Sunny droughty sites - general recreation areas and lawns, low maintenance (somewhat excessively to excessively drained soils). Excluding Long Island.			
	65% fine fescue.....	2.6-3.3	114-143
	15% perennial ryegrass.....	0.6-0.7	26-33
	20% Kentucky bluegrass blend.....	<u>0.8-1.0</u>	<u>35-44</u>
	<u>OR</u>	4.0-5.0	175-220
	100% Tall fescue, Turf-type, fine leaf.....	3.4-4.6	150-200
3. Shady dry sites (well to somewhat poorly drained soils).			
	65% fine fescue.....	2.6-3.3	114-143
	15% perennial ryegrass.....	0.6-0.7	26-33
	20% Kentucky bluegrass blend.....	<u>0.8-1.0</u>	<u>35-44</u>
	<u>OR</u>	4.0-5.0	174-220
	80% blend of shade-tolerant Kentucky bluegrass.....	2.4-3.2	105-138
	20% perennial ryegrass.....	<u>0.6-0.8</u>	<u>25-37</u>
	<u>OR</u>	3.0-4.0	130-175
	100% Tall fescue, Turf-type, fine leaf.....	3.4-4.6	150-200
4. Shady wet sites (somewhat poor to poorly drained soils).			
	70% rough bluegrass.....	1.4-2.1	60-91
	30% blend of shade-tolerant Kentucky bluegrass.....	<u>0.6-0.9</u>	<u>25-39</u>
	<u>OR</u>	2.0-3.0	85-130
	100% Tall fescue, Turf-type, fine leaf.....	3.4-4.6	150-200

For varieties suitable for specific locations, contact Cornell Cooperative Extension Turf Specialist.

Reference: Thurn, M.C., N.W. Hummel, and A.M. Petrovic. Cornell Extension Pub. Info. Bulletin 185 Revised. HomeLawns Establishment and Maintenance. 1994.

7. Fertilizing—First Year

Apply fertilizer as indicated by the soil test three to four weeks after germination (spring seedlings). If test results have not been obtained, apply 1 pound nitrogen/1,000 square feet using a complete fertilizer with a 2-1-1 or 4-1-3 ratio. Summer and early fall seedlings, apply as above unless air temperatures are above 85°F for an extended period. Wait for cooler temperatures to fertilize. Late fall/winter seedlings, fertilize in spring.

8. Restrict Use

New seedlings should be protected from use for one full year to allow development of a dense sod with good root structure.

MAINTAINING GRASSES

1. Maintain a pH of 6.0 - 7.0.
2. Fertilize in late May to early June as follows with 10-10-10 analysis fertilizer at the rate of 10 lbs./1,000 sq. ft. and repeat in late August if sod density is not adequate. Avoid fertilizing when heat is greater than 85°F. Top dress weak sod annually in the spring, but at least once every 2 to 3 years. It is recommended to fertilize according to soil test analysis, after determining adequate topsoil depth exists.
3. Aerate compacted or heavily used areas, like athletic fields, annually as soon as soil moisture conditions permit. Aerate area six to eight times using a spoon or hollow tine type aerator. Do not use solid spike equipment.

4. Reseed bare and thin areas annually with original seed mix.

ESTABLISHING TREES, SHRUBS, AND VINES

1. Planting nursery stock

- A. Select species to serve the intended purpose. See Table 3.3, "Trees Suitable for Landscape and Conservation Plantings in New York." Where planting of trees is to be done in recreation areas, use those species resistant to compaction listed in Table 3.4, "Susceptibility of Tree Species to Compaction" whenever possible.

B. Plant Materials

- 1) Plants shall conform to the species, variety, size, number, and conditions as stated in a conservation plan or on a plant list shown on landscape drawings. "American Standard for Nursery Stock," by American Association of Nurserymen, shall be used to develop the plant list for landscape drawings and to check quality of plant materials.
- 2) Durable, legible labels with the scientific and common name and cultivar shall be securely attached to plants, bundles of seedlings, containers, and/or flats.

C. Plant Protection

Prior to delivery, the trunk, branches, and foliage of the plants shall be sprayed with non-toxic antidesiccant, applied according to the manufacturers recommendations. This does not apply to state nursery seedlings.

D. Planting Time

Deciduous trees and shrubs: April 1 to June 1 and October 15 to December 15.

Evergreen trees and shrubs: April 1 to June 1 and September 1 to November 15.

E. Spacing

Plant all trees and shrubs well back from buildings to allow for mature crown size. The following are guides for planning:

Large trees:	50-60 feet apart
Small trees:	20-30 feet apart
Columnar species:	6-8 feet apart
Hedges:	1-4 feet apart
Shrubs:	For clumps, plan spacing so mature shrubs will be touching or overlapping by only 1 or 2 feet.

F. Site Preparation

- 1) Individual sites for planting seedlings can be prepared by scalping the sod away from a four foot square area where the seedling is to be planted.
- 2) All planting beds shall be cultivated to a depth of 8 inches, or chemically treated for weed control. Remove objectionable objects that will interfere with maintenance of site.

G. Planting

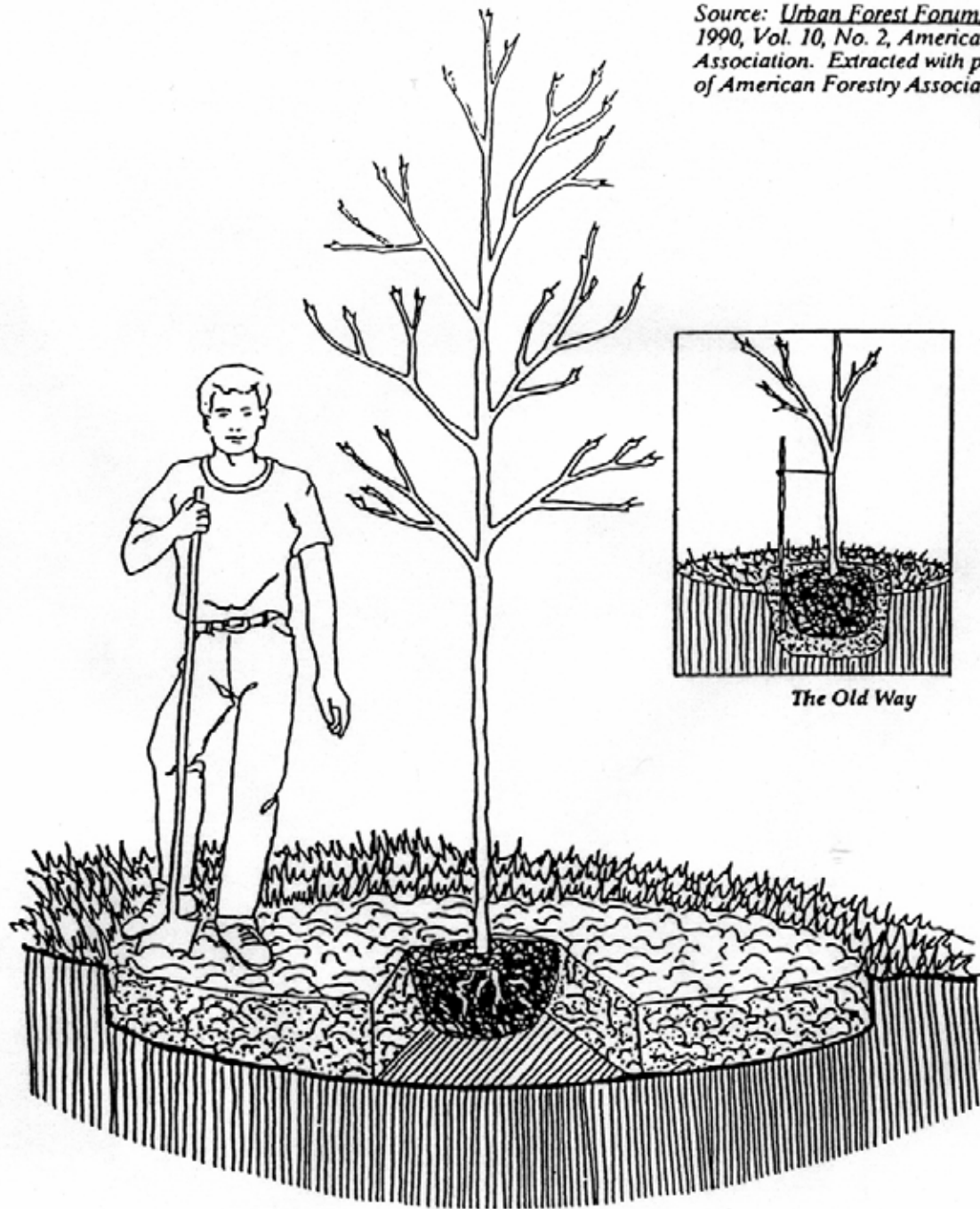
- 1) Plants shall be located as shown on plans and/or drawings and, where necessary, located on the site by stakes, flags or other means.
- 2) Prior to planting, remove galvanized wire basket securing root ball, untie and roll down burlap covering from around the stem.
- 3) The plants shall be set upright in holes as illustrated in Figure 3.1.
- 4) All plants shall be thoroughly watered on the same day of planting. Plants that have settled shall be reset to grade.

H. Wrapping

Immediately after planting, wrap deciduous tree trunks from the bottom to the first limb with a 4 inch wide bituminous impregnated, insect resistant tape or paper manufactured for that purpose. Tie with jute (bag strings) at top and bottom. The wrap should be

Figure 3.1 New Tree Planting Procedure

Source: *Urban Forest Forum*, April/May 1990, Vol. 10, No. 2, American Forestry Association. Extracted with permission of American Forestry Association.



The new method of tree planting will result in better survival and growth than the old method. Grass competition and soil compaction are two of the most common factors in poor performance. The New Method: Prepare a planting area five times the diameter of the root ball or container. Use a rototiller and/or spades to loosen and mix the soil to a depth of about 12 inches. Organic matter (well decomposed) can be added. Dig a hole in the center to set the tree, so that the root ball will rest on solid ground. Backfill around the root area, pressing the soil but not packing it. Mulch the entire prepared area with 2 to 4 inches of bark, wood chips, decomposed sawdust, or leaves. Reference the article for a full explanation.

removed per nursery recommendations.

I. Mulching

Mulch the disturbed area around individual trees and shrubs with a 2-3" layer of wood chips. Pull wood chips 1 inch away from the base of shrubs to avoid fungus development.

J. Pruning

After planting, prune to remove injured twigs and branches. The natural shape of the plant should not be changed.

K. Cleanup and Maintenance

- 1) After all work is complete, all excess soil, peat moss, debris, etc., shall be removed from the site.
- 2) Water plants two weeks after planting. For two years, water plants every two weeks during dry periods, which exceed three weeks without a good soaking rain. Shrubs may require 5 to 10 gallons and trees, 20 to 30 gallons for each watering.
- 3) Remove trunk wrap one year after planting.

2. Transplanting "Wild" Stock

Successful transplanting of wild stock will require heavy equipment and considerable labor as a large weight of soil must be moved with the roots.

- A. Select trees and shrubs with good form and full crowns.
- B. Transplant only when plants are dormant and soil is moist. Wrap soil ball with burlap to prevent soil from separating from roots.
- C. Table 3.5 shows minimum diameter and approximate weight of soil ball that must be moved with each size plant.
- D. Plant and maintain as described above for nursery stock.

PRUNING AND THINNING

Use	Cleared Width Each Side of Trail Tread (ft.)	Cleared Height (ft.)
TRAILS		
Hiking	1	8
Bicycle	2	10
Motorbike	2	10
Horse	2	12
X-Country Ski	Total: 3 - 12	12 ¹
Snowmobile	Total: 6 - 12	12 ¹
PICNIC & CAMPING AREAS		
Campfire/Grill	10 ft. diam.	15+ Locations

1. Pruning

- A. Remove trees, limbs, and limb stubs to the following widths and heights specified for the intended use.

¹ Includes allowance for snow depth and snow load on branches.

- B. Remove dead, diseased, or dying limbs that may fall.
- C. Do not remove more than one-third of the live crown of a tree in a year.
- D. Cut limbs flush to the branch bark ridge.
- E. Use the 3 or 4 cut pruning method on all branches over 2 inches in diameter: First cut about one-third the way through the underside of the limb (about 6-12 inches from the tree trunk). Then (approximately an inch further out) make a second cut through the limb from the upper side. When the branch is removed, there is no splintering of the main tree trunk. Remove the stub. If the branch is larger than 5-6 inches in diameter, use the four cut system. Cuts 1 and 2 remain the same and cut 3 should be from the underside of the limb, on the outside of the branch collar. Cut 4 should be from the top and in alignment with the 3rd cut. Cut 3 should be 1/4 to 1/3 the way through the limb. This will prevent the bark from peeling down the trunk. Do not paint the cut surface.

2. Thinning

- A. Remove dead, diseased, dying, poorly anchored, or ice damaged trees that pose a hazard to recreationists or that interfere with intended use.
- B. To maintain grass cover in a wooded area, thin according to formula $D \times 3$ (average diameter of the trunk of overstory trees, in inches, times three—the answer is the spacing between trees to be left, in feet). For example, for trees with average diameter of 6 inches, spacing after thinning should leave trees 18 feet apart on average. Crown cover after thinning should be about 50 percent.
- C. Selectively thin as needed to favor those trees that are most "resistant" to compaction around their roots. See Table 3.4, "Susceptibility of Tree Species to Compaction." If the soil on the site is naturally well drained, those species in the "intermediate" group may also be favored.

PROTECTING TREES IN HEAVY USE AREAS

The compaction of soil over the roots of trees and shrubs by the trampling of recreationists, vehicular traffic, etc., reduces oxygen, water, and nutrient uptake by feeder roots. This weakens and may eventually kill the plants. Table 3.4 rates the "Susceptibility of Tree Species to Compaction."

Where heavy compaction is anticipated, apply and maintain a 3 to 4 inch layer of undecayed wood chips or 2 inches of No. 2 washed, crushed gravel.

Table 3.3

Trees Suitable for Landscape and Conservation Plantings in New York

TREE SIZE:

Large Sized Trees (75'+) - Trees that exceed this height at maturity.

Medium Sized Trees (35' - 75') - Trees in this height range at maturity.

Small Sized Trees (15' - 35') - Trees relatively low at maturity.

VAR; (x) = varieties of the species are available for various uses.

FOLIAGE:

E = evergreen

c = colorful in fall

l = lustrous; shiny

D = deciduous

d = dense

u = unusual leaves

f = fine textured

SITE TOLERANCE:

cold = hardy in zones 2 and 3 (northeastern mountains)

wet = tolerant of moderately well to somewhat poorly drained soils.

dry = tolerant of sandy, gravelly, excessively drained soils.

shade = will tolerate some shady sites.

sea = trees which may tolerate seaside conditions.

city = trees that withstand usual city conditions.

PEST:

F = usually free S = susceptible

FEATURES:

Habit = general shape of open grown plants.

Bo - broad open (wide)

Co - columnar

FEATURES: (cont'd)

Ho - horizontal branching

Na - narrow

Op - open

Ov - ovoid/oblong

Pe - pendulous

Py - pyramidal

Ro - round

S - spreading

Up - upright

Wo - wide/open

BRK; (x) = bark has interesting characteristics of color, texture or form.

FLR; (x) = flowers are colorful and interesting.

f = fragrant;

s = showy;

u = unusual shape.

FRU; (x) = fruits are interesting and/or edible.

LVS; (x) = leaves have attractive color and/or unusual shape.

USES:

WIND; (x) = suitable for windbreaks and screening.

SHD; (x) = suitable as lawn shade trees.

STRT; (x) = trees often selected for street planting.

WILD; F/c = trees offering food and cover to wild-life.

F = trees providing food from fruits.

W/c = trees offering winter cover.

BARR; (x) = trees which can be used as a barrier to some traffic.

ORN; (x) = trees whose main value is ornamental.

Table 3.3 (cont'd)
Trees Suitable for Landscape and Conservation Plantings in New York

A. LARGE SIZED TREES (75 ft.+)		1. DECIDUOUS SPECIES	SITE TOLERANCE										FEATURES				USES						
			HEIGHT	VAR	FOLIAGE	COLD	WET	DRY	SHADE	SEA	CITY	PEST	HABIT	BRK	FLR	FRU	LVS	WIND	SHDE	STRT	WILD	BARR	ORN
		BEECH, EUROPEAN <i>Fagus sylvatica</i>	90'	X	D,c,d,l								Py	X			X						
		BIRCH, PAPER <i>Betula papyrifera</i>	90'		D,c	X							Py	X									X
		BIRCH, RIVER <i>Betula nigra</i>	90'		D,c		X						Py	X									
		CHERRY, BLACK <i>Prunus serotina</i>	90'	X	D,d,l	X			X			S	X	X	X	X				F			X
		GINKGO <i>Ginkgo biloba</i>	120'		D,c,u				X		F	Wo					X		X				
		GUM, BLACK TUPELO <i>Nyssa sylvatica</i>	90'		D,c,d,l		X			X		Py											X
		HICKORY, PIGNUT <i>Carya glabra</i>	120'		D,c			X				Ro								F			X
		HICKORY, SHAGBARK <i>Carya ovata</i>	120'	X	D,c							Na/Up	X							F			X
		HONEYLOCUST ¹ <i>Gleditsia</i> spp.	135'	X	D,c,u			X		X	F	Bo						X		X			
		JAPANESE ZELKOVA <i>Zelkova serrata</i>	90'		D,c							Ro						X					
		KATSURA TREE <i>Cercidiphyllum japonicum</i>	60-100'		D,c,u						F	Ro						X					
		LINDEN, LITTLE-LEAF <i>Tilia cordata</i>	90'	X	D,d	X			X			Py		X	X			X		X			
		LONDON PLANE TREE <i>X Platanus acerifolia</i>	100'		D							S	X					X					
		MAPLE, RED <i>Acer rubrum</i>	120'	X	D,c	X	X					Ro	X	X				X		X			
		MAPLE, SUGAR <i>Acer saccharum</i>	120'	X	D,c	X						Ov						X		X			
		OAK, WHITE <i>Quercus alba</i>	90'		D,c							Ro/S						X		X		F	X
		POPLAR, HYBRID ² <i>X Populus</i>	90'	X	D							varies							X				
		POPLAR, WHITE <i>Populus alba</i>	90'	X	D,c,u	X		X		X		S		X									X
		SWEET-GUM <i>Liquidambar styraciflua</i>	125'	X	D,c,u		X				F	Py						X		X			X

Table 3.3 (cont'd)

Trees Suitable for Landscape and Conservation Plantings in New York

A. LARGE SIZED TREES (75 ft.+)	2. EVERGREEN SPECIES	SITE TOLERANCE										FEATURES				USES						
		HEIGHT	VAR	FOLIAGE	COLD	WET	DRY	SHADE	SEA	CITY	PEST	HABIT	BRK	FLR	FRU	LVS	WIND	SHDE	STRT	WILD	BARR	ORRN
	CEDAR, EASTERN RED <i>Juniperus virginiana</i>	90'	X	E,d	X		X		X		F	Py	X		X		X					WC
	FIR, DOUGLAS <i>Pseudotsuga menziesii</i>	300'	X	E,d								Py		X			X					WC
	FIR, WHITE <i>Abies concolor</i>	120'	X	E,c								Py			X		X					WC
	HEMLOCK, CANADA <i>Tsuga canadensis</i>	90'	X	E,d	X							Py					X					WC
	LARCH, EUROPEAN <i>Larix decidua</i>	100'	X	D,c	X							Py		X								X
	PINE, AUSTRIAN <i>Pinus nigra</i>	90'	X	E					X			Py					X					WC
	PINE, EASTERN WHITE <i>Pinus strobus</i>	100-150'	X	E	X							Ro/Py					X					WC
	PINE, JAPANESE BLACK <i>Pinus thunbergii</i>	90'		E					X			S										WC
	SPRUCE, COLORADO <i>Picea pungens</i>	100'	X	E,c,d	X				X		S	Py			X		X					WC
	SPRUCE, NORWAY <i>Picea abies</i>	150'	X	E,d	X							Py		X			X					WC
	SPRUCE, SERBIAN <i>Picea omorika</i>	90'		E,c,d								Py				X	X					WC
	SPRUCE, WHITE <i>Picea glauca</i>	90'	X	E	X				X			Py			X		X					WC

¹ Thornless, seedless cultivars recommended² Select male, non-root suckering, disease resistant cultivars

Note: It is not recommended to combine Colorado Blue Spruce or any other spruce with Douglas Fir in the same landscape design. Douglas Fir is an alternate host for the Cooley Spruce Gall Aphid.

Table 3.3 (cont'd)
Trees Suitable for Landscape and Conservation Plantings in New York

B. MEDIUM SIZED TREES (35'-75')	1.DECIDUOUS SPECIES	HEIGHT	VAR FOLIAGE	SITE TOLERANCE					FEATURES					USES						
				COLD	WET	DRY	SHADE	SEA	CITY	PEST	HABIT	BRK	FLR	FRU	LVS	WIND	SHDE	STRT	WILD	BARR
	ALDER, EUROPEAN <i>Alnus glutinosa</i>	75'	D	X	X					Ov						X				
	ALDERS <i>Alnus spp.</i>	60'-75'	D,d	X	X				S	Ro		X				X				
	ASH, FLOWERING <i>Fraxinus ornus</i>	60'	D,d							Ro		X,I					X			X
	ASH, GREEN <i>Fraxinus pennsylvanica</i>	60'	D,c,d	X						Ro				X			X			
	BIRCH, SWEET <i>Betula lenta</i>	75'	D,c	X						Py	X			X						X
	CHERRY, EUROPEAN BIRD <i>Prunus padus</i>	45'	D,u	X						Op		X,I	X					F		
	CHERRY, PIN 1 <i>Prunus pennsylvanica</i>	36'	D,c,f	X		X				Op	X	X	X	X				F		X
	CHERRY, SARGENT <i>Prunus sargentii</i>	75'	D,c,d							Up	X	X				X	X	F		X
	CHESTNUT, CHINESE <i>Castanea mollissima</i>	60'	D,c,d,I							Ro				X				F		
	CHOKECHERRY, AMUR <i>Prunus maackii</i>	45'	D,d	X						Ro	X	X						F		X
	CRAB APPLE, SIBERIAN <i>Malus baccata</i>	50'	D,d	X					S	Na		X,f	X					F		X
	CRIMEAN LINDEN <i>X Tilia euchlora</i>	60'	D,d,I							Pe		X,f				X	X			
	DOGWOOD, FLOWERING <i>Cornus florida</i>	40'	D,c,d,I	X					F	Ho	X	X,u	X	X			X			X
	ELM, SIBERIAN <i>Ulmus pumila</i>	75'	D,f			X				Ro/OpF						X				
	HAWTHORN, COCKSPUR <i>Crataegus crus-galli</i>	36'	D,d,I	X		X				S	Ro/S	X	X	X				F	X	X
	HOLLY, AMERICAN <i>Ilex opaca</i>	45'	E,d,u	X					X	F	Py		X	X				WC		X
	HORNBEAM, AMERICAN <i>Carpinus caroliniana</i>	36'	D,c,d	X		X				F	Ro	X		X	X		X	F		
	HORNBEAM, EUROPEAN <i>Carpinus betulus</i>	60'	D,d	X						Py						X			X	
	HORNBEAM, HOP <i>Ostrya virginiana</i>	60'	D,d						F	Py		X	X					F	X	X

Table 3.3 (cont'd)

Trees Suitable for Landscape and Conservation Plantings in New York

B. MEDIUM SIZED TREES (35'-75')																		
1. DECIDUOUS SPECIES	HEIGHT	VAR FOLIAGE	SITE TOLERANCE					FEATURES					USES					
			COLD	WET	DRY	SHADE	SEA CITY	PEST	HABIT	BRK	FLR	FRU	LVS	WIND	SHDE	STRT	WILDBARR	ORN
JAPANESE PAGODA TREE <i>Sophora japonica</i>	75'	X D			X				F	Ro	X	X			X	X		X
LOCUST, BLACK 2 <i>Robinia pseudoacacia</i>	75'	X D	X		X					Ov		X						
MAPLE, STRIPED <i>Acer pensylvanicum</i>	36'	X D,u	X			X				Op	X		X					X
MOUNTAIN-ASH, EUROPEAN <i>Sorbus aucuparia</i>	45'	X D						S		S		X	X	X			F	X
MOUNTAIN-ASH, KOREAN <i>Sorbus alnifolia</i>	60'	X D,d								Py/Ro	X	X	X	X				X
MULBERRY, WHITE <i>Morus alba</i>	45'	X D,d,u			X		X			Ro		X	X	X			F	
OAK, RED <i>Quercus borealis</i>	75'	D,d,l	X					X		Ro		X	X	X		X	X	F
OAK, SWAMP WHITE <i>Quercus bicolor</i>	60'	D,d	X	X						Na/Ro			X	X			F	
OAK, WILLOW <i>Quercus phellos</i>	50'	D,f								Ro						X		X
POPLAR, SIMON <i>Populus simonii</i>	50'	X D,d	X							Na						X		X
REDBUD, EASTERN <i>Cercis canadensis</i>	36'	X D,c,u								Wo		X	X	X				X
SASSAFRAS <i>Sassafras albidum</i>	60'	D,u								So	X		X	X				X
SERVICEBERRY <i>Amelanchier</i> spp.	25'-60'	D,c				X	X	S		S	X	X	X	X			F	X
SORREL TREE <i>Oxydendrum arboreum</i>	75'	D,c,d,l								Py		X	X	X				X
WILLOW, THURLOW WEEPING X <i>Salix elegantissima</i>	40'	D,f		X					S	Pe								X
WILLOW, WHITE <i>Salix alba</i>	75'	X D	X	X						Up		Colored winter twigs						X
YELLOW-WOOD, AMERICAN <i>Cladrasis lutea</i>	50'	X D,c,d	X							Ro	X	X	X	X				X

¹ Spreads rapidly by root suckers² Spreads rapidly by root suckers, do not plant near Pine Barrens ecosystems

Table 3.3 (cont'd)
Trees Suitable for Landscape and Conservation Plantings in New York

B. MEDIUM SIZED TREES (35'-75')	2. EVERGREEN SPECIES	HEIGHT	VAR	FOLIAGE	SITE TOLERANCE					FEATURES			USES										
					COLD	WET	DRY	SHADE	SEA	CITY	PEST	HABIT	BRK	FLR	FRU	LVS	WIND	SHDE	STRT	WILD	BARR	ORN	
	ARBORVITAE, AMERICAN <i>Thuja occidentalis</i>	60'	X	E,u	X	X	X	X	X			Co					X				WC		X
	FIR, KOREAN <i>Abies koreana</i>	50'		E,d								Py				X	X				WC		X
	FIR, VEITCH <i>Abies veitchii</i>	75'		E,c	X							Py				X	X				WC		
	HEMLOCK, CAROLINA <i>Tsuga caroliniana</i>	75'		E,d						X		Py/Pe					X	X			WC		X
	PINE, JACK <i>Pinus banksiana</i>	75'		E	X		X					Bo									WC		
	PINE, PITCH <i>Pinus rigida</i>	75'		E			X					Op									WC		
	PINE, RED <i>Pinus resinosa</i>	75'		E	X		X		X			Py					X				WC		
	PINE, SCOTCH <i>Pinus sylvestris</i>	75'	X	E	X				X			Op/Py	X				X				WC		
	PINE, SWISS STONE <i>Pinus cembra</i>	75'		E,d	X							PyS									WC		X
	SPRUCE, BLACK	50'		E,d	X	X		X				Co					X				WC		
	SPRUCE, BLACK HILLS	75'		E,d	X		X				F	Co					X				WC		

Table 3.3 (cont'd)

Trees Suitable for Landscape and Conservation Plantings in New York

C. SMALL SIZED TREES (15'-35')	SITE TOLERANCE										FEATURES					USES					
	HEIGHT	VAR	FOLIAGE	COLD	WET	DRY	SHADE	SEA	CITY	PEST	HABIT	BRK	FLR	FRU	LVS	WIND	SHDE	STRT	WILD	BARR	ORN
1. DECIDUOUS SPECIES																					
BIRCH, GRAY <i>Betula populifolia</i>	30'		D	X		X				S	several stems	X			X						X
BLACKHAW <i>Viburnum prunifolium</i>	30'		D,c,1	X									X	X	X				F		X
CHERRY, CORNELIAN <i>Cornus mas</i>	24'	X	D,1							F	Ro		X	X	X				F		
CHERRY, SOUR <i>Prunus cerasus</i>	30'	X	D	X							Ro		X	X					F		X
CORK TREE, AMUR <i>Phellodendron amurense</i>	30'		D	X							Wo	X		X	X						
CRABAPPLES <i>Malus</i> spp	15'-30'		D	X						S	Ro		X,s	X				X	F		X
DOGWOOD, JAPANESE <i>Cornus kousa</i>	20'	X	D,d,1								Ho		X,s	X	X						X
HAWTHORNS <i>Crataegus</i> spp	15'-30	X	D,d	X		X				S	Rathomy		X	X	X			X	F		X
LABURNUM SCOTCH <i>Laburnum alpinum</i>	30'	X	D								U		X,u								
LILAC, JAPANESE TREE <i>Syringa amurensis japonica</i>	30'		D,coarse									X	X,u								X
MAPLE, AMUR <i>Acer ginnala</i>	20'	X	D,c,d	X			X				Up/Ro		X,f	X	X						X
MAPLE, MOUNTAIN <i>Acer spicatum</i>	25'		D,coarse	X			X				Ov			X	X						X
MOUNTAIN-ASH, SHOWY <i>Sorbus decora</i>	30'	X	D	X						S	shrubby		X	X							X
NANNYBERRY <i>Viburnum lentago</i>	30'		D,c,1	X			X				dense/shrubby		X	X	X				F		X
RHODODENDRON, ROSEBAY <i>Rhododendron maximum</i>	12'-36'	X	E	X			X				Ro		X								X
SEA-BUCKTHORN, COMMON <i>Hippophae rhamnoides</i>	30'			X						X	Ro/o		X	X	X						X

Table 3.4
Susceptibility of Tree Species to Compaction¹

Resistant:

Box elder.....	<i>Acer negundo</i>	Willows.....	<i>Salix spp.</i>
Green ash.....	<i>Fraxinus pennsylvanica</i>	Honey locust.....	<i>Gleditsia triacanthos</i>
Red elm.....	<i>Ulmus rubra</i>	Eastern cottonwood.....	<i>Populus deltoides</i>
Hawthornes.....	<i>Crataegus spp.</i>	Swamp white oak.....	<i>Quercus bicolor</i>
Bur oak.....	<i>Quercus macrocarpa</i>	Hophornbeam.....	<i>Ostrya virginiana</i>
Northern white cedar....	<i>Thuja occidentalis</i>		

Intermediate:

Red maple.....	<i>Acer rubrum</i>	Sweetgum.....	<i>Liquidambar styraciflua</i>
Silver maple.....	<i>Acer saccharinum</i>	Norway maple.....	<i>Acer platanoides</i>
Hackberry.....	<i>Celtis occidentalis</i>	Shagbark hickory.....	<i>Carya ovata</i>
Black gum.....	<i>Nyssa sylvatica</i>	London plane.....	<i>Platanus x hybrida</i>
Red oak.....	<i>Quercus rubra</i>	Pin oak.....	<i>Quercus palustris</i>
Basswood.....	<i>Tilia americana</i>		

Susceptible:

Sugar maple.....	<i>Acer saccharum</i>	Austrian Pine.....	<i>Pinus nigra</i>
White pine.....	<i>Pinus strobus</i>	White ash.....	<i>Fraxinus americana</i>
Blue spruce.....	<i>Picea pungens</i>	Paper birch.....	<i>Betula papyrifera</i>
White oak.....	<i>Quercus alba</i>	Moutain ash.....	<i>Sorbus aucuparia</i>
Red pine.....	<i>Pinus resinosa</i>	Japanese maple.....	<i>Acer palmatum</i>

¹ If a tree species does not appear on the list, insufficient information is available to rate it for this purpose.

Table 3.5
Size and Weight of Earth Ball Required to Transplant Wild Stock

Caliper ¹ (Inches)	Shade Trees (Maple, Ash, Oak, Birch, etc.)		Small Trees & Shrubs (Crabapple, Thornapple, Viburnum, Dogwood, etc.)		
	Minimum Diameter Ball (Inches)	Weight of Ball (lbs.)	Up to 6 ft. Height — 6 ft. and Caliper ¹	Minimum Diameter Ball (Inches)	Weight of Ball (lbs.)
1/2	14	88	2	12	55
3/4	16	130	3	14	88
1	18	186	4	16	130
1-1/4	20	227	5	18	186
1-1/2	22	302	3/4	18	186
1-3/4	24	390	1	20	227
2	28	621	1-1/2	22	302
3	32	836	1-3/4	24	390
3-1/2	38	1,400	2	28	621
4	42	1,887	2-1/2	32	836
			3	38	1,400

¹Caliper is a diameter measurement of trees at a height of 6 inches above the ground.
(American Standards for Nursery Stock)