THE ASSESSMENT OF TREE PRIORITY AT THE UNITED STATES MILITARY ACADEMY

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Abstract. The United States Military Academy at West Point, New York, attracts more than three million visitors each year. Trees dominate the 1,700-ac (700-ha) urban community that is part of a 16,000-ac (6,500-ha) heavily forested scenic hillside on the west bank of the Hudson River. A tree inventory was conducted in 1996 and 1997 to help develop a tree management program. This inventory included typical inventory elements used to determine maintenance priority: pruning, removal, and hazard assessment as well as species, size, and condition. This inventory, however, adds an additional element usually not found in other tree inventories—overall priority assessment. Overall tree priority values were determined by assigning specific values to each tree according to species, condition, specimen, function, heritage, memorial, historical, location, and special designation (tree trail), then adding the values together for a total priority value. Priority values can help the landscape manager better identify the trees that have the most significance on the property and provide the documentation necessary for better allocation of funds to preserve and protect those trees considered the most important. This method of priority assessment can also be used with any tree inventory for college campuses, parks, golf courses, cemeteries, and municipalities.

Key Words. Tree inventory; priority assessment; urban forest management.

The United States Military Academy (USMA) grounds consist of over 16,000 ac (6,500 ha) located on a scenic and historic tract of land on the west bank of the Hudson River, 60 mi (95 km) north of New York City. The location held military significance during the American Revolution when Washington's forces gained control of the river by building fortifications on its steep slopes. Its establishment as an officer training academy began in 1802, making the USMA the nation's oldest service academy and the oldest continuously occupied military post. In addition to the 4,000-member Corps of Cadets and their campus buildings and barracks, West Point has other military installation support buildings and staff. The overall population of West Point is 8,250 people who work within a forested urban area covering over 1,700 ac (700 ha). Located close to New York City, West Point is also one of America's greatest tourist attractions, with over 3 million visitors each year.

Trees were planted on the post soon after its establishment. However, records of tree planting have not been maintained. A tree inventory of 1,029 trees conducted in 1929 is one of the few records of tree management in its urban areas. The heavy visitor traffic and steep terrain increase the difficulty of landscape, turf, and tree maintenance. In 1995, it was decided that there was need for an inventory and a management program for the trees growing in the USMA' s urban areas.

Most street tree inventories contain the same basic information about species makeup, size, condition, and maintenance requirements. Miller (1997) discusses in detail various methods of conducting street tree inventories and provides an excellent bibliography on the subject. Barro et al. (1997) discuss a program, Chicagoland Treemendous Trees, in which trees of great size were given special recognition. American Forests recognizes trees on a national basis with its National Register of Big Trees. Munson (1993) discusses a historic American elm infected with Dutch elm disease and the public hearing that was required before the tree could be removed from its location at Smith College.

The tree inventory at the USMA combined the elements found in basic tree inventories to produce an overall tree priority assessment by giving each element a value and adding all the values for a total tree priority value. The use of tree priority is not new in inventory assessments. The Bartlett Tree Expert Co., like many others involved in tree inventory assessments, has used a priority assessment of 1, 2, or 3 for pruning, cabling, protecting from lightning, fertilizing, removal, etc., in relation to tree maintenance action. The company has also conducted tree inventories

(e.g., Old King's Highway inventory) in which values were given to the various elements and overall priority value was determined (Ingram, pers. comm.).

The Arboricultural Specifications Manual for the city of Moline, Illinois, uses a formula that adds various elements for the determination of total points. Trees having the highest points are given the highest priority for scheduling tree work (Greene, pers. comm.). The priority assessment of USMA trees differs from most tree inventories by recognizing historic, heritage, memorial, functional, and special trees rather than determining priority for specific maintenance or scheduling of work. The USMA priority assessment helps determine the most important tree on the property, thereby helping to determine which tree(s) should receive lightning protection, protection from construction, irrigation during drought, and fertilization or other arboricultural treatments first. Because no one has unlimited maintenance funds, priority assessment is important so that funds are allocated for trees that are the most important.

METHODOLOGY

A basic inventory of 8,000 trees was conducted at the USMA during the summers of 1996 and 1997. Because the USMA has thousands of trees on its property, only those within the urban areas were included in the inventory. Information was recorded for each tree on a data sheet containing the following headings: reference number (R#: refers to a numbered aluminum tag nailed to each tree; each tree (SPECIES) was designated by a common name code; any known cultivars (CULTIVAR) were recorded; trunk diameters at 4.5 ft (1.4 m) above the ground (DBH) to 40 in. (102 cm) were measured using a Biltmore stick, and those with a diameter greater than 40 in. were measured with a diameter tape; condition class (CC, described below) provides vital information about tree size, health, and expected longevity; condition (CON) represents tree health in 1 of 6 classifications (excellent, good, fair, poor, very poor, dead); prune (PRN) represents 1 of 3 pruning maintenance classifications (priority —requires immediate attention, routine—can be done on a routine cycle, and staff—can be done without climbing or chain saws by trained workers); a specimen tree (S), which is a superior example of its species; a functional tree (F), which provides some type of function (e.g., provides shade, lines the street, adds beauty); a memorial tree (M), which is planted in memory of a loved one; a heritage tree (H), which dates back to presettlement times; a historical tree (HIS), which is planted by someone for a specific reason other than memorial; its location (LOC); the number (29#) from an inventory conducted in 1929; and additional information (REMARKS). From the REMARKS section, the following headings were added to the database: HAZARD ASSESSMENT for all trees determined to be in need of a specific detailed hazard assessment; CABLE for all trees that were in need of cabling; CONSTRUCTION DAMAGE for all trees showing evidence of injury due to recent construction activities; VINES for all trees covered by dense vines; and POISON IVY for all trees covered with poison ivy.

In 1997, tree trails were established in the USMA cemetery and in the Trophy Point and parade grounds areas. A new heading, Tree Trail (TT), was added to the database. dBASE III™ (Ashton-Tate) was used to compile the inventory data. Priority values were determined using Microsoft® Excel, Office 97 (Microsoft Corporation). The condition class system used was modified from the system first described by Green (1984). This classification system provides vital information about tree size, health, and expected longevity (Green 1996).

Condition Class

- CLASS 1.0: Newly planted; not established but expected to live a long time.
- CLASS 1.5: Newly planted; not established but has a severe limiting factor such that treatment(s) may be necessary to prevent premature death.
- CLASS 2.0: Established tree; not mature size but expected to live a long time.
- CLASS 2.5: Established tree; not mature size but has a severe limiting factor such that treatment(s) may be necessary to prevent premature death.
- CLASS 3.0: Mature tree; healthy; expected to live at least 20 years.
- CLASS 3.5: Mature tree but has some limiting factor that may warrant treatment(s) to prevent premature death. Any key or specimen tree that rates a 3.5 should strongly be considered for

fertilizing, special irrigation, pruning, cabling, mulching, or other arboricultural treatment.

CLASS 4.0: Mature tree with such a severe limiting factor that tree death is expected within 20 years regardless of any treatments. Under certain circumstances, treatment is warranted to prolong tree life.

CLASS 4.5: Mature tree that is so near death that treatment is not recommended and is considered a waste of time and money. Immediate removal is not usually necessary for safety reasons. Young trees rated 4.5 are considered undesirable species (e.g., Siberian elm, mulberry, boxelder maple), and their removal is recommended before they become too large.

CLASS 5.0: Mature tree that is dead or nearly dead; immediate removal is recommended for safety reasons. Also, trees with serious contagious diseases, such as Dutch elm disease, oak wilt, pine wilt, and ash yellows, are noted for immediate removal.

Priority Designation

Numerical values were given to SPECIES, CON (condition), S (specimen tree), F (functional tree), M (memorial tree), H (heritage tree); HIS (historical tree); LOC (tree location); and TT (tree trail).

Species value: Each species was given a numerical rating of 1 for those that were highly desirable and highly recommended for additional use, 0 for those considered usable but not highly recommended for additional use, and –1 for those considered undesirable and weedy. All species values are shown in Table 1.*

CON value: Trees rated as excellent and good were given values of 1; fair trees were given values of 0; and poor, very poor, and dead trees were given values of –1.

S value: Specimen trees were given values of 1, and those not designated as specimen were given values of 0.

F value: Functional trees were given values of 1, and those not designated as functional were given values of 0. Almost all the trees inventoried were designated as functional.

M value: Memorial trees were given values of 1, and those not designated as memorial were given values of 0.

H value: Heritage trees were given values of 1, and those not designated as heritage were given values of 0.

HIS value: Historical trees were given values of 1, and those not designated as historical were given values of 0.

LOC value: Trees on the grounds surrounding the house of the post commander (a 3-star general) or his assistants (two 1-star generals), those on Professor's Row (residential area for colonels who head various departments), Trophy Point, or cadet parade grounds, and those near barracks, classroom buildings, and the historic cemetery were given location values of 2; trees surrounding all other buildings on the property were given location values of 1; trees not near buildings were given a 0 location value. It is possible for trees that are planted too close to buildings or trees blocking vistas to have a –1 location value, although no tree was designated as such.

Tree trail value: Tree trail trees are given a value of 2. Trees not on a tree trail are given a value of 0. Tree trail trees are given a higher value because they are permanently located on a map, with the expectation that visitors will want to locate these trees.

A priority value was calculated for each tree using Excel. Trees with the highest priority value were sorted in descending order (Table 2).

RESULTS

Species

The USMA has a rich species diversity, with a total of 150 different taxa identified (Table 1). It should be noted that Norway maple was given a priority value of –1. Throughout the region, Norway maple is growing wild and replacing the native forest, and nothing except other Norway maple grows beneath its dense shade. It is considered a very serious and noxious weed.

*Tables for this article begin on page 299.

Condition

Overall, the trees at USMA are in relatively good condition. Eight trees were recommended for immediate removal (CC 5.0), 154 trees were recommended for removal but were not considered hazardous (CC 4.5), and 1,167 trees (15%) were believed to be gone in the next 20 years (CC 4.0).

Heritage Trees

Very few trees were designated as heritage trees. Settlement of the area dates back to the late 1600s, and the original native forest was dominated by white pine (Pinus strobus). By the American Revolution, most of the forests lining the Hudson River had been cut. A drawing of West Point in 1793 by Pierre Charles L'Enfant shows a treeless landscape. Therefore, a few native species with diameters greater than 40 in. (102 cm) were designated as heritage trees, but they probably do not date back to presettlement times.

Historical Trees

The USMA is full of historical trees. Each graduating class after 1867 has had a tree planted for its class. These trees are represented by in-ground plaques with class dates. If a class tree dies, the plaque is often moved to another tree. Most of the original class trees have died. A peach tree planted for a Peach Bowl victory by the football team is also classified as a historic tree. Trees known to be planted by the post superintendent, important dignitaries, or visitors are considered historic trees. Arbor Day trees are considered historic trees.

Tree Trail

The USMA is a major tourist attraction because of its mission and tradition, training of future Army officers, significance during the American Revolution, and scenic position on the Hudson River. With its great diversity of magnificent specimen trees, it is also worthy of attracting visitors interested in its trees.

With this priority assessment system, the LOCATION and TREE TRAIL designation heavily weight the overall priority value. Location value and tree trail value each are worth 2. Table 2 lists the 2 trees that received the highest priority value (9) and the 29 trees with a priority value of 8. Table 3 lists the number of trees assigned each priority value.

DISCUSSION

Many of the trees with priority values of 7 and 8 are large, dominant, specimen trees that would obviously deserve high priority rating. However, the 2 trees that had values of 9 and many of the others with values of 7 or 8 were not considered worthy of special consideration without a priority assessment. Many of these trees are young, small-diameter trees that are not very obvious. This assessment system reveals the trees that deserve a higher level of management focus. There are 287 trees with values of 6 and higher. This is a reasonable number of trees that can be given higher levels of management.

Monetary value for individual trees was not calculated at the USMA. Monetary value could be used for priority assessment and could easily be calculated using the database. Large-diameter trees would usually have high value, and this value could be used to augment the tree priority value in determining overall significance. However, many of the trees with the highest priority value were small-diameter trees (e.g., the 3-in. [7.6-cm] Turkish filbert, Corylus colurna, PV = 9) that would be relatively easy to replace and had relatively low monetary value. Using monetary value alone could result in many trees possibly being overlooked concerning their overall significance.

Below are the discussion and recommendations, INTERPRETATION OF THE DATA, based on the inventory and priority assessment.

1. Overview: The USMA is well endowed with a valuable forest resource, both in its natural areas and urban areas. The preservation of the forest resource is possible only with a proactive management program, which includes maintenance of an inventory, planting for renewal and perpetuation, establishment of priority, arboricultural care for tree with special needs, and removal of hazards.
2. Importance of trees: Trees are a significant part of the infrastructure of the USMA. Trees in the natural areas provide a green carpet over the rough, mountainous terrain. In the fall, the colors add to the scenic appeal. The trees around the buildings help define spaces, provide screens, add perspective and scale to the large stone buildings, frame vistas, and provide shade and beauty to the landscape.

Replacement of the turf landscape can be done very rapidly. Buildings, if damaged by storm or fire, can be replaced in months. However, the trees would take decades and in some cases over a century to replace. A conservative estimate of the monetary value of the 10,000 trees growing in its urban community is US$10,000,000.

3. Need for management arborist position: Considering the significance of the urban trees at USMA and their intrinsic value, there is a need for a professionally trained urban arborist to manage and maintain the trees and handle tree requests from the staff and residents.
4. Development of a landscape master plan: Any property the size of the USMA and that contains such diverse vegetation should have a landscape master plan that is part of an overall master plan.
5. Construction threat to trees: The utility infrastructure at USMA is in need of repair and replacement. Such repair and replacement place trees above and near utility corridors in great peril. Protection should be given to the trees with the highest priority values.
6. Preservation of vistas: The USMA has spectacular scenic views of the Hudson River. However, these views are gradually disappearing. Trees growing into the vistas should be removed and replaced with small trees downslope. This will lower the need to continually prune tall trees on steep slopes.
7. Perpetuation of the existing native forest: The residual native forest is considered one of the most valuable assets of the property. It offers great beauty. The woodlands areas are rich and diverse and relatively stable. However, the invasion of Norway maple is a very serious threat to the stability of the native woodlands. Norway maple produces heavy shade, and virtually nothing but other Norway maples will grow below their canopies. Wherever the Norway maple grows, the native species are eliminated, and without understory plants, roots are lacking to hold the soil and prevent erosion. The area downslope of the cemetery is seriously infested with Norway maple, and the groundcover is very impoverished. All Norway maple trees growing in wooded areas should be systematically removed. There should be some consideration to reintroduce ground fires in natural areas to help preserve the native species. The fires will help remove many of the nonnative species and help open the woodlands into more parklike areas.
8. Historical trees: The USMA has a long tradition of planting trees in honor of graduating classes. This tradition should be continued with a special focus on trees, their planting, and their care at the time of dedication. Trees planted by graduating classes will not live forever. When a tree dies, it is recommended that the dead tree be replaced with the same species in the same location. If the tree species has become susceptible to a disease or insect pest or if the location needs to be changed, modifications can be made, along with documentation of why another species was used or why the location was changed. Slow-growing native species should be the primary choice for class trees. Slow-growing hardy and nonweedy species should be a secondary choice for class trees. Some class trees, such as native oaks, may be hard to locate at local nurseries and could be grown on the grounds and moved to the chosen site for class dedication. Many graduates receive assignments where they oversee facility maintenance. The special instruction about trees at the time of class dedication could be helpful in the protection and preservation of trees on all Army facilities.
9. Memorial trees: Offering a memorial tree program is a great way to add trees to the grounds. There are very few memorial trees on the grounds. Memorial trees are recognized by a marker near the tree, but there may be memorial trees without markers. The USMA has a good opportunity to add trees to the grounds by offering a memorial tree program. Memorial trees do not have to have permanent markers on the trees or on the ground near the trees. However, any tree planted as a memorial tree should be recorded in both the active inventory as well as in a document available to the public. Such a document could be kept at the Visitor Center or other location generally

open to the public. A memorial tree program needs to be under the direction of the management agronomist or arborist. Individuals wishing to make donations for a memorial tree would choose a tree from the list of approved memorial trees. Specific planting site selection would also be under the direction of the management agronomist or arborist. It is recommended to set a minimum dollar amount, such as US$400, for each memorial tree to be planted on the grounds. Money coming in for memorial trees should not be used to reduce routine maintenance and planting budgets.

10. Dutch elm disease control program: The USMA has numerous young elms, some of which have Dutch elm disease. It is extremely important to remove all elms rated as 5.0 (see Condition Class 5.0) immediately. It is very possible that living elms near the 5.0 elms may become infected, especially via root grafts. It is essential every year to inspect the elms on the grounds and remove any showing initial symptoms of DED. With the small number of American elms, it would be easy to conduct a DED control program. High-priority American elms should be inspected weekly May through July and monthly August and September. When symptoms of DED are observed, prompt action should be taken. Trees showing symptoms should be pruned 7 to 10 ft (2 to 3 m) to below wood that exhibits brown streaking. At the same time, samples should be sent to a lab for diagnosis. High-priority trees could be considered for fungicide injections once every 3 years.
11. Deer control program: As the number of deer increases, it will be increasingly difficult to plant and grow ornamental trees and shrubs on the grounds. No place appears to be exempt from deer damage. Deer populations are expected to continue to increase and without something to check growth, damage to landscape plants will increase. Currently, the only effective method to control deer population is physical removal with the use of sharpshooters. The Morton Arboretum in Illinois has successfully controlled the size of its deer herds by this method without adverse publicity. Planting trees and shrubs that deer do not favor does not work; this method reduces species diversity and after the favored plants have been browsed, the deer will begin to browse the nonpreferred plants. It is possible to remove deer and handle the publicity around this sensitive subject. It is recommended to bring in a wildlife specialist and someone who has had experience in public relations with deer removal.
12. Vine control program: Weedy vines on trees are a relatively minor problem for a few trees. There are two vines of significance: poison ivy (Toxicodendron radicans) and Oriental bittersweet (Celastrus orbiculatus). Trees with poison ivy can be a health hazard to maintenance workers and to children who may play in the natural areas. Some of the young trees are overwhelmed by the poison ivy plants causing shade and interfering with tree growth and establishment. Poison ivy vines should be cut on trees in the winter. The new shoots in the spring can treated chemically to kill the plant. Oriental bittersweet is a very serious weed. Birds spread the seeds throughout the natural areas. When this plant twines around young trees, it can girdle and kill them. All Oriental bittersweet should be cut and treated chemically to eliminate it as soon as it is found.

The priority assessment system can be used in any landscape in which individual trees are inventoried. It is especially useful on golf courses, college campuses, parks, large private estates and cemeteries. Priority values may be adjusted.

LITERATURE CITED

Barro, S.C., et. al. 1997. What makes a big tree special? Insights from the Chicagoland Treemendous Trees Program. J. Arboric. 23(6):239–249.

Green, T.L. 1984. Maintaining and preserving wooded parks. J. Arboric. 10(7):193–197.

Green, T.L. 1996. Tree inventory and management program for college campuses, pp 310–316. In Koester, R.J. (Ed.). Greening of the Campus Conference Proceedings, April 4–6, Ball State University, Muncie, IN.

Greene, T.L. Personal communication.

Ingram, J.B. Personal communication.

Miller, R.W. 1997. Urban Forestry: Planning and Managing Urban Greenspaces, 2nd ed. Prentice-Hall, Englewood Cliffs, NJ. 502 pp.

Munson, R.H. 1993. Handling the demise of historic trees: A problem of public relations. J. Arboric. 19(1):4850.

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Résumé. L'Académie militaire des États-Unis de WestPoint dans l'état de New York attire plus de trois millions de visiteurs par an. Les arbres dominent les 772 ha de la zone urbaine qui constitue une partie des 7272 ha de paysage forestier à flanc de montagne sur la rive ouest de la rivière Hudson. Un inventaire des arbres a été effectué en 1996 et 1997 afin de favoriser le développement d'un programme de gestion des arbres. L'inventaire incluait des éléments typiques de prise de données utilisés comme espèce, dimension et condition tout comme ceux propres à la détermination des priorités d'entretien comme élagage, abattage et évaluation de risques de bris. Des valeurs globales de classification (priorités) d'intérêts et de conservation ont aussi été données à chacun des arbres à partir de valeurs sur divers critères: espèce, condition, arbre specimen ou unique, fonction, héritage, mémorial, historique, localisation, désignation spéciale (arbre de sentier). Les valeurs de classification d'arbres peuvent être utiles au gestionnaire d'espaces verts pour mieux identifier les arbres qui ont le plus de signification sur cette propriété; elles fournissent des informations appropriées pour une meilleure allocation des ressources financières pour préserver et protéger les arbres les plus importants.

Zusammenfassung. Die Militärakademie die Vereinigten Staaten in West Point, New York, zieht jährlich 3 Millionen Besucher an. Die 1.700 acre große Gemeinde, die Tel einer 16.000 acre großen Hügellandschaft auf der Westseite des Hudson-Rivers ist, wird von Bäumen dominiert. 1996 und 1997 wurde eine Bauminventur durchgeführt, um bei der Entwicklung eines Baummanagement-Programmes zu helfen. Diese Inventur enthielt typische Inventurelemente zur Bestimmung von vorrangigen Pflege- und Erhaltungsmaßnahmen, wie Baumschnitt, Fällung und Überprüfung der Standsicherheit, sowie auch Art, Größe und Zustand. Die Inventur enthielt aber auch zusätzliche Elemente, die in anderen Bauminventuren nicht zu finden sind; z.B. eine Untersuchung der Prioritäten. Die übergeordneten Werte wurde dadurch festgelegt, in dem jedem Baum ein Wert zugeordnet wurde gemäß folgenden Merkmalen: Art, Zustand, Exemplar, Funktion, Naturschutz, Historie, Standort und eine besondere Bestimmung des Baumes. Die Bäume mit dem höchsten Wert können dem Landschaftspfleger dabei helfen, diejenigen Bäume besser zu identifizieren, die die meiste Bedeutung für den Bestand haben und die die notwendige Dokumentation darstellen, um Mittel zur Erstellung und Schutz der wichtigsten Bäume zu bekommen. Diese Methode der Untersuchung der Wertigkeit kann auch für alle anderen Bauminventuren auf Universitätsgeländen, Parks, Golfplätzen, Friedhöfen und öffentlichen Anlagen angewendet werden.

Resumen. La Academia Militar de Estados Unidos localizada en West Point, N.Y., atrae cerca de tres millones de visitantes cada año. Los árboles dominan las 772 ha (1,700 acres) de la comunidad urbana, la cual es parte de una pintoresca ladera altamente arbolada de 7,272 ha (16,000 acres) en el banco oeste del río Hudson. Un inventario de árboles fue conducido en 1996 y 1997 para ayudar al desarrollo de un programa de manejo de árboles. El inventario incluía los elementos típicos usados para determinar la prioridad de mantenimiento, tales como poda, remoción y estimación de riesgo, así como especies, tamaño y condición. Los valores totales prioritarios fueron también asignados a cada árbol de acuerdo a: especie, condición, espécimen, función, herencia, si se trata de un monumento, si es histórico, localización y designación especial (ubicación del árbol). Los valores de prioridad de los árboles pueden ayudar mejor al administrador del paisaje a identificar los árboles que son más significativos en la propiedad y proveen la documentación necesaria para la mejor asignación de fondos para preservar y proteger aquellos árboles que se consideran los más importantes.

Table 1. Trees of the United States Military Academy, with species priority values.

Value[z]	Genus	Species	Cultivar	Common name
0	Abies	balsamea		Balsam fir
1		concolor		Concolor fir
0		spp.		Fir species
1	Acer	campestre		Hedge maple
1		cissifolium		Ivy-leafed maple
0		ginnala		Amur maple
–1		negundo		Boxelder maple
1		nikoense		Nikko maple
0		palmatum		Japanese maple
1		pensylvanicum		Striped maple
–1		platanoides		Norway maple
1		rubrum		Red maple
0		saccharinum		Silver maple
1		saccharum		Sugar maple
1		triflorum		Three flower maple
0	Aesculus	hippocastanum		Horsechestnut
–1	Ailanthus	altissima		Tree of heaven
–1	Albizia	julibrissin		Mimosa
1	Amelanchier	arborea		Downy serviceberry
0		spp.		Serviceberry species
0	Betula	alleghaniensis		Yellow birch
1		nigra	Heritage	River birch
0		papyrifera		Paper birch
–1		pendula		European birch
0		populifolia		Gray birch
1	Calocedrus	decurrens		Incensecedar
1	Carpinus	betulus		European hornbeam
1		caroliniana		Blue beech
1	Carya	cordiformis		Bitternut hickory
1		glabra		Pignut hickory
1		ovata		Shagbark hickory
1		tomentosa		Mockernut hickory
1		spp.		Hickory species
–1	Castanea	dentata		American chestnut
0	Catalpa	speciosa		Catalpa
0	Celtis	occidentalis		Hackberry
1	Cercidiphyllum	japonicum		Katsuratree
1	Cercis	canadensis		Redbud
0	Chamaecyparis	pisifera		Japanese falsecypress
1	Cladrastis	kentuckea		Yellowwood
–1	Cornus	florida		Flowering dogwood
1		kousa		Kousa dogwood
1		mas		Cornelian cherry dogwood
0	Corylus	avellana		European filbert
–1		avellana	Contorta	Corkscrew filbert
1		colurna		Turkish filbert
0	Crataegus	crus-galli		Cockspur hawthorn
1		crus-galli	Inermis	Thornless cockspur hawthorn
0		mollis		Downy hawthorn
0		phaenopyrum		Washington hawthorn
1		viridis	Winter King	Winter king hawthorn
–1	Elaeagnus	umbellata		Autumn olive
1	Fagus	grandifolia		American beech
1		sylvatica		European beech
1	Fraxinus	americana		White ash
0		excelsior		European ash
0		excelsior	Hessei	Hessei ash
1		pennsylvanica		Green ash
1	Ginkgo	biloba		Ginkgo
0	Gleditsia	triacanthos		Honeylocust
1	Halesia	carolina		Carolina silverbell
1	Ilex	opaca		American holly
–1	Juglans	cinerea		Butternut
1		nigra		Black walnut
1		regia		English walnut
1	Juniperus	chinensis		Chinese juniper
0		virginiana		Eastern red cedar
0	Koelreuteria	paniculata		Goldenrain tree
–1	Laburnum	∞ watereri		Goldenchain tree
1	Larix	decidua		European larch
1	Liquidambar	styraciflua		Sweet gum
0	Liriodendron	tulipifera		Tuliptree
0	Maclura	pomifera		Osage orange
1	Magnolia	acuminata		Cucumbertree magnolia
1		salicifolia		Anise magnolia
1		∞ soulangiana		Saucer magnolia
1		tripetela		Umbrella magnolia
–1	Malus	domestica		Apple
0,1		spp.		Crabapple
1	Metasequoia	glyptostroboides		Dawn redwood
–1	Morus	alba		Mulberry (white)
1		rubra		Red mulberry
1	Nyssa	sylvatica		Black gum
1	Ostrya	virginiana		Hophornbeam
1	Oxydendrum	arboreum		Sourwood
0	Picea	abies		Norway spruce
0		glauca		White spruce
1		omorika		Serbian spruce
0		pungens		Colorado spruce
0	Pinus	aristata		Bristlecone pine
1		densiflora	Umbraculifera	Tanyosho Japanese red pine
0		mugo		Mugo pine
0		nigra		Austrian pine
0		ponderosa		Ponderosa pine
–1		resinosa		Red pine
1		strobus		White pine
–1		sylvestris		Scots pine
0	Platanus	occidentalis		Sycamore
1		∞ acerifolia		London planetree
–1	Populus	deltoides		Cottonwood
0		grandidentatum		Bigtooth aspen
0	Prunus	avium		Sweet cherry
–1		cerasifera		Cherry plum
–1		persica		Peach

(continued)

Table 1 (continued). Trees of the United States Military Academy, with species priority values.

Value[z]	Genus	Species	Cultivar	Common name
–1	Prunus	serotina		Black cherry
0		serrulata	Kwanzan	Oriental cherry
0		subhirtella	Pendula	Higan cherry
0		spp.		Cherry or Prunus species
0		∞yedoensis		Yoshino cherry
0	Pseudotsuga	menziesii		Douglasfir
0	Ptelea	trifoliata		Wafer ash
0	Pyrus	calleryana		Callery pear
–1		communis		Common pear
1	Quercus	acutissima		Sawtooth oak
1		alba		White oak
1		bicolor		Swamp white oak
1		cerris		Turkey oak
1		coccinea		Scarlet oak
0		imbricaria		Shingle oak
0		palustris		Pin oak
1		prinus		Chestnut oak
1		robur		English oak
1		rubra		Red oak
1		variabilis		Oriental oak
1		spp.		Hybrid oak
–1	Robinia	pseudoacacia		Black locust
–1	Rhamnus	cathartica		Common buckthorn
–1	Salix	alba	Tristis	Weeping willow
–1		matsudana	Tortuosa	Corkscrew willow
–1		spp.		Pussy willow
1	Sassafras	albidum		Sassafras
1	Sophora	japonica		Japanese pagodatree
0	Sorbus	alnifolia		Korean mountainash
–1		aucuparia		European mountainash
1	Syringa	reticulata		Japanese tree lilac
1	Taxodium	distichum		Baldcypress
–1	Taxus	spp.		Yew
–1	Thuja	occidentalis		Arborvitae
0	Tilia	americana		Basswood
0		cordata		Littleleaf linden
1		tomentosa		Silver linden
1		∞europaea		European linden
–1	Tsuga	canadensis		Hemlock
0	Ulmus	americana		American elm
1		glabra	Camperdown	Camperdown elm
1		parvifolia		Lacebark elm
1		procera		English elm
–1		rubra		Red elm
1	Viburnum	prunifolium		Blackhaw viburnum
1	Zelkova	serrata		Japanese zelkova

[z]1 = highly desirable, recommended for use; 0 = species has some undesirable features, limited use; –1 = undesirable, not recommended for use.

Table 2. Individual trees having the highest 2 priority value rankings, where PV = Σ of N + C + S + F + H + M + HI + TT + LOC.

Common name	PV	DBH	N#	C#	S#	F#	H#	M#	HI#	TT#	LOC#
Turkish filbert	9	3	1	1	1	1			1	2	2
European beech	9	15	1	1	1	1		1		2	2
Cherry	8	6		1	1	1			1	2	2
Swamp white oak	8	22	1	1		1			1	2	2
Kousa dogwood	8	5	1	1	1	1				2	2
European ash	8	37		1	1	1			1	2	2
Littleleaf linden	8	19		1	1	1			1	2	2
Green ash	8	9	1	1		1			1	2	2
Lacebark elm	8	4	1	1	1	1				2	2
Zelkova	8	7	1	1	1	1				2	2
London planetree	8	12	1	1	1	1				2	2
Ginkgo	8	13	1	1	1	1				2	2
Red oak	8	19	1	1	1	1				2	2
Red maple	8	11	1	1	1	1				2	2
Sugar maple	8	11	1	1	1	1				2	2
American beech	8	5	1	1	1	1				2	2
White Pine	8	17	1	1	1	1				2	2
Ginkgo	8	19	1	1	1	1				2	2
Dawn redwood	8	22	1	1	1	1				2	2
English walnut	8	28	1	1	1	1				2	2
Oriental oak	8	26	1	1	1	1				2	2
Black walnut	8	20	1	1	1	1				2	2
European beech	8	20	1	1	1	1				2	2
Cucumbertree magnolia	8	31	1	1	1	1				2	2
Lacebark elm	8	4	1	1	1	1				2	2
Zelkova	8	10	1	1	1	1				2	2
White oak	8	36	1	1	1	1				2	2
European beech	8	34	1	1	1	1				2	2
European beech	8	30	1	1	1	1				2	2
American beech	8	9	1	1	1	1				2	2
Hedge maple	8	5	1	1	1	1				2	2

DBH = diameter at 4.5 ft; N# = species (name) value; C# = condition value; S# = specimen tree value; F# = functional tree value; H# = heritage tree value; M# = memorial tree value; HI# = historical tree value; TT# = Tree trail tree value; LOC# = location value.

Table 3. Number of trees by priority value.

Priority value	9	8	7	6	5	4	3	2	1	0	–1
Tree total	2	29	60	196	907	1,761	2,102	1,813	768	327	35