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Overview

The population of white-tailed deer (*Odocoileus virginianus*) in Connecticut has increased dramatically, from very few in the early 20th century to over 100,000 today. This rebound is due to the shortage of predators and the ability of deer to quickly and plentifully reproduce. Simultaneously, areas of natural vegetation have been greatly diminished, as neighborhoods have been constructed within deer's natural territory, which has led to a rise in feeding damage of specimen horticultural plants. The over-abundance of these docile, but voracious, creatures impacts design and maintenance of landscapes, especially in urban and suburban communities.

School landscapes should not attract deer or encourage their visitation and feeding. The design should dissuade deer browse by incorporating (primarily native) plants that are less palatable to deer into school landscapes.

Habitat and Behavior

Deer are herbivores, primarily browsers, who feed on both woody and herbaceous plants. They consume an average of 5-15 lbs./day of leaves, shoots, twigs, lichens, and fruit. When a preferred food source, such as acorns, corn, or hay, is abundant, they will eagerly devour it, but when favored vegetation is unavailable, deer will eat almost anything to survive (*Figure 1*). In spring, deer seek out young, tender new growth emerging from the ground, as they prefer soft vegetation with a high water content, particularly delicate young flower buds. Well-fertilized and over-watered plants are often especially lush and appealing.



Figure 1. When food is scarce, deer will browse on any available food source, even plants they normally do not prefer, such as Yucca.

Deer injure and disfigure plants not only by eating leaves and stems, but also by rubbing antlers against the bark of trees. When they locate plants that they truly favor, or when food options are limited, deer may strip plants of leaves or bark. The severity of the damage depends on the season, food availability, food source, and weather conditions. Damage is most common on plants that are low-branched, easy to reach, accessible, and small or young. This behavior is particularly damaging to young trees with thin bark.

Deer will continually venture to urban and suburban landscapes to forage, especially in winter months when food is scarce. Deer can be creatures of habit; they usually frequent areas where they feel safe and the scent of other deer is evident.

Human and Ecological Threats from High Deer Populations

With hunting prohibited in many CT municipalities, the high population of deer has become an extensive problem. The surplus population of deer in suburban and urban locations may present a challenge for landscape maintenance and has the potential to impact the health and safety of school children, teachers, and staff.

Deer are the primary host of the adult Blacklegged or Deer Tick (*Ixodes scapularis*) that transmits diseases, including Lyme, Babesiosis, and Anaplasmosis. Tick eradication options on daycare and K-8 school properties have been severely reduced, due to Connecticut's ban on Environmental Protection Agency (EPA) registered pesticides. Discouraging deer populations on school properties is the first line of defense to reduce overall tick populations.

Forests with high populations of deer have reduced natural revegetation of desired hardwood species. Many wildflowers and flowering shrubs, including threatened or endangered species, such as trilliums and orchids, are favored as a food source by deer. Many browse-resistant plants, such as the invasive Asiatic bittersweet and Japanese barberry, have lower economic, aesthetic, and wildlife value than the species they displace. Many bird species and small mammal populations are negatively impacted by the change in forest ecosystems caused by excessive deer browse.

The most important way to discourage deer from feeding on and disfiguring plants in the landscape is to incorporate species that deer prefer not to eat. However, no plant is completely deer proof. Deer must be redirected so that they avoid locations where their browsing is not acceptable. They need to be convinced the area is not safe and the food source to which they are drawn is unsavory.

Strategies to reduce browse damage and to protect plant material on school properties include:

- **Incorporate deer-resistant plants** into the landscape (Figure 2). See pages 3-5 for a list of recommended plants.
- **Divide the school landscape into deer feeding preference zones**, prioritized by attractiveness to deer and damage potential. Plant the most browse-resistant plants along the far edge of the property where deer frequent. Plants that are the most susceptible to browse damage should be used infrequently and interspersed with deer resistant plants or grown within a fenced or protected area, such as a school courtyard.
- **Shield young trees and those with thin bark by placing protective devices that discourage feeding and deer rub.** Use tree protectors, plastic tree wrap, burlap, netting, or fishing line to restrict access to young or specimen plants. Wire-mesh cylinders that encircle the trunk are easy to create and install. Fishing line strung around specimen plants is a simple and inexpensive method to confuse and repel deer. Regardless of the product used, the design should not pose a hazard to children who may travel near the landscaped area.
- **Use fencing to restrict deer access when possible.** Fences must be at least 7-8' high, with no more than 6" x 6" gaps, and must extend to the ground (Figure 3). While fencing is the best deterrent to protect plant material from deer, it may be impractical on school property settings.
- **Modify fertilization of landscape plants** if deer consistently travel to a specific location. Deer favor lush, well-fertilized plants, but may avoid the same plants if they are less appetizing.
- **Use motion-activated lights, sprinklers, or noisemakers**, where appropriate, to startle deer and cause them to flee. Success with these type of deterrents is often short-lived. Deer become accustomed to and recognize the devices if they are not moved or altered in pattern that keeps deer constantly wary.
- **Annual clean-up of school property perimeters and woodline edges helps to reduce tick populations.** Good sanitation along property boundaries is essential to limit the opportunity for ticks to encounter deer hosts that may travel close to areas where students frequent.
- **Incorporate the use of CT Department of Energy and Environmental Protection (DEEP) approved EPA minimum risk repellents.** Repellents are products that deter feeding or discourage deer browse because of an unpleasant taste or odor. They must be applied repeatedly, especially after rain events, to protect new growth as it emerges. Coverage of the plant should begin at the ground level and extend upward at least six feet. Some repellents are to be sprayed on ribbons as part of fencing kits rather than directly on plant surfaces. Due to the lingering unpleasant taste or odor, many of these repellents may not be suitable for landscape beds adjacent to school buildings. **Refer to DEEP's most current list of approved EPA minimum risk products** (portal.ct.gov/DEEP/pesticides) as a resource of available products. All products used to discourage feeding must be referenced in the district's Integrated Pest Management (IPM) plan, if placed in a school landscape. **Homemade recipes are unregistered and by law are not allowed to be applied on school properties.**



Figure 2. Incorporate deer-resistant plants, such as fragrant sumac (*Rhus aromatica* 'Gro-Low'), which has fantastic fall foliage color and can grow in tough locations. Figure 3. Fencing must be 7-8' high to deter deer.

For more information, refer to CT.Gov, [NC State Extension Powerpoint](#), and [CAES](#).

DEER RESISTANT TREES

In the below list, “rarely damaged” plants are the **least likely to attract deer and are recommended** if plant damage by deer browse is of high concern. For more information, refer to [UConn’s Native Plant and Sustainable Landscaping Guide](#), available at s.uconn.edu/UConnNativePlantGuide.

Deer Tolerance Key:

Light Key:

R = Rarely Damaged **S** = Seldom Severely Damaged **FS** = Full Sun **PS** = Part Shade **SH** = Full Shade

TREE SPECIES	Deer Toler.	Height	Width	Flower Color	Flower Time	Light	Native?	Attributes/Maintenance
Arborvitae 'Green Giant' (<i>Thuja plicata x standishii</i>)	S	40-60'	15-20'	----	----	FS	No	Evergreen. Popular, fast-growing cultivar. Prefers moist, deep, loamy soil. Attractive pyramidal shape that requires little to no pruning. In optimal conditions, can grow 3-4 feet per year. Use for hedge, screen, windbreak.
Birch, sweet (<i>Betula lenta</i>)	S	40-70'	35-50'	brown, green	April-May	FS/PS	Yes	Best in deep, rich, moist, acidic soils, in full sun; tolerates light shade. Sensitive to soil compaction. Good fall color (yellow). <i>Also</i> : river birch (<i>Betula nigra</i>) is adaptable, tolerant of heat and poor drainage; gray birch (<i>Betula populifolia</i>) has ornamental bark and is fast growing but short-lived.
Eastern red-cedar (<i>Juniperus virginiana</i>)	S	30-65'	10-20'	----	----	FS	Yes	Evergreen. Adapts to poor, droughty soils; pH adaptable. Very tough; screening, naturalizing, coastal planting. Best drought resistance of any conifer native to U.S.
Ginkgo (<i>Ginkgo biloba</i>)	R	50-80'	30-40'	green	April	FS	No	Tolerant of a wide range of soil conditions. Dioecious - fruit from females has unpleasant odor. Excellent fall color.
Honey locust (<i>Gleditsia triacanthos f. inermis</i>)	R	30-70'	20-30'	green-yellow, white	May-June	FS	No	Good street and parking lot tree. Tolerant of drought, air pollution, clay soil. <i>F. inermis</i> is a thornless and nearly seedpod-free variety. Native to southeast U.S. Beneficial to bees, butterflies, and birds.
Maple, sugar (<i>Acer rubrum</i>)	S	40-80'	30-50'	red	March-April	FS/PS	Yes	Adaptable; tolerant of many conditions. Relatively fast growing. Red-orange showy fall color. Ornamental bark. Shallow roots. Beneficial to bees, butterflies, and birds.
Maple, sugar (<i>Acer saccharum</i>)	S	40-80'	30-60'	green	April	FS/PS	Yes	Easily grown in average, medium, well-drained soil in full sun to part shade. Prefers fertile, slightly acidic soil. Shade tolerant. Excellent specimen tree for lawn or parks. Has been frequently used as a street tree, but is generally intolerant of road salt, soil compaction and pollution.
Oaks (<i>Quercus</i> spp.)	S	50-100'	20-30'	yellow-green	April - May	FS/PS	Yes	Many oaks make good lawn or street trees (<i>Q. bicolor</i> , <i>Q. rubra</i> , <i>Q. velutina</i>). All oaks have exceptional wildlife value. Oaks have a taproot, making them difficult to transplant.
Pine, eastern white (<i>Pinus strobus</i>)	R	50-80'	20-40'	----	----	FS	Yes	Prefers fertile soil and cool, humid climates. Some susceptibility to white pine blister rust and white pine weevil. Water roots deeply, particularly in dry spells, but avoid wetting the foliage. Plant in protected locations; apply a winter mulch.
Serviceberry (<i>Amelanchier arborea</i>)	S	15-25'	15-25'	white	March-April	FS/PS	Yes	Root suckers can be removed to produce a more tree like form, or will become shrubby. Attractive fall color, fragrant flower; edible red berries attract birds. Salt tolerant.
Tulip tree (<i>Liriodendron tulipifera</i>)	R	70-90'	30-40'	yellow-orange	May-June	FS	Yes	Large shade, lawn tree. Not recommended as a street tree. Fast-growing; susceptible to limb breakage in storms. Good fall color. Beneficial to bees, butterflies, and birds.

Ornamental grasses and ferns are also nearly all highly resistant to deer damage.

In addition to those species mentioned in this document, deer tend to avoid plants with strong scents and acrid, bitter flavors, such as herbs; that have thorns or prickles on leaves or stems; with hairy or fuzzy foliage; and that are poisonous or have thick, latex-like sap.

SHRUB SPECIES	Deer Toler.	Height	Width	Flower Color	Flower Time	Light	Native?	Attributes/Maintenance
Bayberry (<i>Morella pensylvanica</i>)	R	5-10'	5-10'	yellow-green	May	FS/PS	Yes	Tolerates drought, erosion, wet soils. Salt tolerant. Roots form suckers to colonize an area. Best in groups or massed. Foliage fragrant; fruit showy - attracts birds, provides winter interest. Separate male and female plants - need at least one male plant for fruit production on females.
Boxwood (<i>Buxus sempervirens</i>)	R	15-20'	10-15'	insignif- icant	Spring	FS/PS	No	Drought tolerant. Protect from drying winds, especially in winter. Evergreen. Root rot can be a problem in poorly draining soils. Used for foundation planting or low hedge.
Cypress, Siberian (<i>Microbiota decussata</i>)	S	.5-1.5'	3-12'	----	----	FS/PS	No	Dwarf, evergreen conifer forms excellent ground cover. Best performance is in cool summer climates. More shade tolerant than ground cover Junipers.
Dogwood, silky (<i>Cornus amomum</i>)	S	6-12'	6-12'	yellow-white	May-June	FS/PS	Yes	Copious blue fruits, red fall color. Adaptable to a range of cultural situations. Can be used as hedge or in rain garden. Excellent food source for bees, butterflies, and birds.
Leucothoe, drooping (<i>Leucothoe fontanesiana</i>)	R	3-7'	3-7'	creamy white	May-June	PS	No	Prefers moist, fertile, acidic soils. Not drought tolerant. Evergreen. Fragrant, long lasting flowers. Needs little or no pruning; rejuvenate if needed by cutting back to the ground after flowering. Native to southeast U.S.
Mountain-laurel (<i>Kalmia latifolia</i>)	R	5-15'	5-15'	white, pink, red	late May - June	FS/PS	Yes	Evergreen. Solution plant for dry, acidic shade locations. Requires a cool, moist, acidic, organic soil for best performance. Avoid windswept sites. CT state flower.
Pieris, Japanese (<i>Pieris japonica</i>)	R	4-8'	3-6'	white	late March-April	FS/PS	No	Prefers fertile, acidic soils and mulch. Evergreen. Protect from winter winds. Watch for lacebug infestations. Prune immediately after flowering in late spring.
Spicebush (<i>Lindera benzoin</i>)	R	6-12'	6-12'	yellow	March	FS/PS	Yes	Used as hedge, in rain gardens, woodland borders. Good fall color (best in full sun). Butterfly larval host plant. Fragrant. Attracts and supports butterflies, bees, and birds.
Sumac, fragrant (<i>Rhus aromatica</i> 'Gro-Low')	R	1.5-2'	5-8'	yellow	Spring	FS/PS	Yes	Salt tolerant. If winter injury or die back, cut the affected part down to 6"; it will regrow. Showy red fruit in fall; fast spreader. Attracts and supports birds and bees.
Sweetbells (<i>Eubotrys racemosa</i>)	R	4-6'	4-6'	white, pink	May-June	FS/PS	Yes	Thrives in moist locations; performs well in much drier soils as well. Bell-shaped flowers. Suckers form colonies. Bright red fall color. Attracts and supports butterflies and bees.
Sweetfern (<i>Comptonia peregrina</i>)	R	2-5'	4-8'	yellow	April-May	FS/PS	Yes	Performs well in dry, infertile soils. Difficult to transplant; best when container grown. Good for naturalizing and embankments. Fragrant foliage.
Sweetgale (<i>Myrica gale</i>)	R	3-4'	3-5'	yellow	March-May	FS/PS	Yes	Prefers moist or wet soils, can grow in very acid soil. Plant fixes nitrogen. Separate male and female plants; both needed to produce seed. Aromatic fruit and foliage.

DEER RESISTANT PERENNIALS

PERENNIAL SPECIES	Deer Tol.	Height	Width	Flower Color	Flower Time	Light	Native?	Attributes/Maintenance
Anise hyssop (<i>Agastache foeniculum</i>)	R	2-4'	2-3'	lavender - purple	June-Sept.	FS	Yes	Prefers dry to medium soils. Good cut flower. May re-seed. Good soil drainage is essential. Attracts hummingbirds; nectar supports native bees and butterflies.
Aster, New Eng. (<i>Symphotrichum novae-angliae</i>)	S	3-6'	3-5'	purple, blue	August-Sept.	FS	Yes	Syn. <i>Aster novae-angliae</i> . Adaptable to a wide range of soil moisture. Showy, good cut flowers. Nectar source for bees and monarch butterflies. Larval host plant for pearl crescent and checkerspot butterflies.
Bleeding heart (<i>Dicentra spectabilis</i>)	R	2-3'	1.5-2.5'	white, pink	April-May	PS/SH	No	Prefers moist, moderately fertile soils. Intolerant of wet soils in winter, dry soils in summer. Good soil drainage is essential. Foliage usually goes dormant by mid-summer; plant among groundcover/late developing perennials (e.g., ferns).
Bleeding heart, fringed (<i>Dicentra eximia</i>)	R	1-1.5'	1-1.5'	rose pink to purplish red	April-July	PS	Yes	Prefers moist, moderately fertile soils. Intolerant of wet soils in winter and dry soils in summer. Naturalizes by self-seeding in favorable environments. Good soil drainage is essential.
Coneflower, pale purple (<i>Echinacea pallida</i>)	R	2-3'	1-2'	pale purple	June-July	FS/PS	Yes	Adaptable to a wide range of soil moisture. Long tap root; drought tolerant. Mixes well with grasses. Showy, fragrant, good cut flowers. Self-seeds freely. Attracts and supports beneficial pollinators (butterflies, bees).
Ginger, European (<i>Asarum europaeum</i>)	R	6"	1-1.5'	green-yellow, brown	April-May	PS/SH	No	Prefers moderately fertile, consistently moist, acidic soils. May self-seed. Glossy, leathery, heart-shaped leaves used for groundcover in heavy shade.
Ginger, wild (<i>Asarum canadense</i>)	R	6"-1'	1-1.5'	purplish-brown	April-May	PS/SH	Yes	Prefers moderately fertile, consistently moist, acidic soils. Spreads slowly by rhizomes. Attractive groundcover for heavy shade.
Indigo, false (<i>Baptisia australis</i>)	R	3-4'	3-4'	indigo blue	May-June	FS/PS	Yes	Roots should not be disturbed once plants established. Taller plants may need support, particularly when grown in part shade locations. Best flowering in full sun. Attracts butterflies. Attractive seed heads in summer/fall.
Milkweed, butterfly (<i>Asclepias tuberosa</i>)	R	1-2.5'	1-2'	orange	June-August	FS	Yes	Prefers dry to medium soils. Essential food source for Monarch butterfly caterpillars. Good cut flower. May re-seed. Good soil drainage essential.
Sage, Russian (<i>Perovskia atriplicifolia</i>)	R	3-4'	3-4'	purplish blue, lavender	July-Sept.	FS	No	Drought tolerant. Blue-grey, fragrant foliage. Provide room for spread. 'Little Spire' is a compact cultivar.
Spurge, Allegheny (<i>Pachysandra procumbens</i>)	S	.5-1'	1-2'	white	March-April	PS/SH	Yes	Drought tolerant. Fragrant flowers. Prefers acidic, fertile soil. For ground cover, set plants 6-12" apart. Spreads slowly to form colonies. Avoid overhead watering; thin plants periodically for air circulation to prevent disease.
White baneberry (<i>Actaea pachypoda</i>)	R	1.5-2.5'	2-3'	white	May-June	PS/SH	Yes	Prefers humus-rich, moist soil in woodlands and shade gardens. Attractive, but poisonous, white berries. Intolerant of dry soils. Naturalizes by self-seeding.
White snake-root (<i>Ageratina altissima</i>)	R	3-5'	1-3'	white	Sept.-frost	PS/SH	Yes	Prolific self-seeder; deadhead if unwanted. Prefers part shade in moist, rich soils; tolerates moderately dry soils. Attracts and supports beneficial pollinators (butterflies, bees).
Wild geranium (<i>Geranium maculatum</i>)	R	1-3'	1-3'	pink-lavender	March-July	PS/SH	Yes	Deadheading prolongs bloom. Native to dry or moist woods; woodland edges; dappled meadows. Thrives under variety of conditions - rich, acidic. Seeds attract doves, bobwhite quail.
Yarrow (<i>Achillea millefolium</i>)	R	1.5-2.5'	1-2'	white	June-Sept.	FS	Yes	Drought and salt tolerant. Fragrant flowers attract butterflies. 'Sunny Seduction' is a popular yellow cultivar.



These species are highly favored by deer and likely to sustain significant damage from deer browse:



Perennials:		
Cardinal flower (<i>Lobelia</i> spp.)	Daisy (<i>Leucanthemum</i> spp.)	Daylily (<i>Hemerocallis</i> spp.)
Hardy Geranium (<i>Geranium</i> spp.)	Hollyhock (<i>Alcea rosea</i>)	Hosta (<i>Hosta</i> spp.)
Lily (<i>Lilium</i> spp.)	Garden phlox (<i>Phlox paniculata</i>)	Purple Coneflower (<i>Echinacea</i> spp.)
Rose Mallow (<i>Hibiscus</i> spp.)	Sea-holly (<i>Eryngium</i> spp.)	Strawberry (<i>Fragaria</i> spp.)
Shrubs and Trees:		
American Arborvitae (<i>Thuja occidentalis</i>)	Atlantic White Cedar (<i>Chamaecyparis</i> sp.)	Azalea (<i>Rhododendron</i> spp.)
Blueberry (<i>Vaccinium</i> spp.)	Burning Bush (<i>Euonymus alatus</i>)	Cherry (<i>Prunus</i> spp.)
Apple (<i>Malus</i> spp.)	Eastern Redbud (<i>Cercis canadensis</i>)	English Ivy (<i>Hedera helix</i>)
Fringetree (<i>Chionanthus virginicus</i>)	Pear (<i>Prunus</i> spp.)	Plum (<i>Prunus</i> spp.)
Rhododendron (<i>Rhododendron</i> spp.)	Rose (<i>Rosa</i> spp.)	Yew (<i>Taxus</i> spp.)



Deer damage to hosta (*Hosta* sp.) (left), burning bush (*Euonymus alatus*) (center), and American arborvitae (*Thuja occidentalis*) (right).

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