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Urban Forestry Section

Saving Native Trees

In the Pacific Northwest

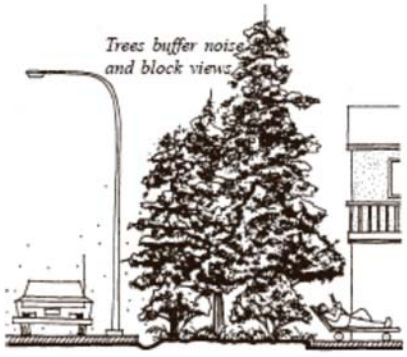
A Guide to Native Tree Retention for Developers, Homeowners, Contractors and Professionals

Why save native trees?

Native trees are an important part of our west coast heritage and they improve the urban landscape in several ways. Urban forests are beneficial to all of us, whether we live in the City or the suburbs. Yet many native trees in our urban environment are threatened. If we construct more roads and buildings without protecting native trees, the trees will decline and die.

Your Neighbourhood

- New housing developments with treed areas feel more like ***well-established neighbourhoods***.
- Trees can ***screen out undesirable views*** or help create privacy

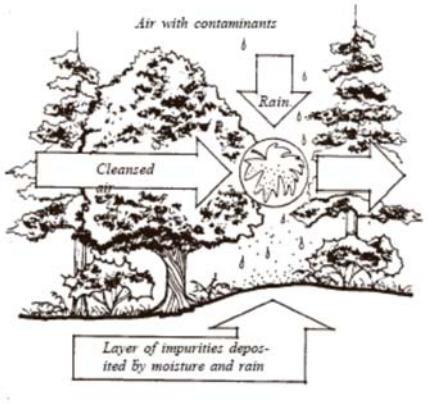


- Densely wooded area, 50 metres wide, effectively reduce sound levels. Narrower wooded screens reduce the effects of noise by putting it "out of sight and out of mind".

A Healthy Home

- ***Trees attract birds and other wildlife***, which in turn help to control insects and other pests. Wildlife provides enjoyment for residents and trees help reduce our urban living stresses.

- Native trees condition and ***cleanse the air*** by providing a settling chamber for air pollutants. Dense groups of trees also mask fumes and disagreeable odours.



- Treed areas ***slow down strong winds*** and create sheltered zones both leeward and windward.
- Forest canopies ***protect the soil*** surface form erosion by heavy rain.
- ***Roots stabilize the soil*** on slopes.

Dollars and Sense

- Homes on wooded lots have ***more value***, a value often high enough to cover the developer's increased costs of building on wooded land.
- Vegetation shades and protects buildings from the wind and ***lowers long-term energy costs.***

How do I save native trees?

Wooded lots are usually preferred over non-wooded lots, but many people do not know how to protect their trees during and after site development.

Leaving Trees Does Not Equal Preserving Trees

Native tree retention requires more planning than leaving a few trees scattered around a development or single family house. ***Retention must be part of a complete landscape and drainage plan that considers all the ecological characteristics of the site.*** The strategy for saving native trees includes analysis of the forest character, planning, supervision during construction, and long-term maintenance.

Forest Character

Some forests characteristics are directly related to the potential for saving individual trees or creating retention "zones".

Individual *specimen* trees are preserved after clearing the undesirable trees from the forest. Ground cover and shrubs should accompany the individual tree at its base. A *retention zone* is a complete forest unit that has an understory ground cover, shrub and young tree layers and mature trees.

Mixed Forest Stands

Mixed forest stands, with coniferous and deciduous trees of various ages and sizes have the best chance of survival when retained.

- As a guideline for retention, leave a minimum 75-100 metre wide block in ***woodland areas***, and a minimum 15-20 metre wide band for ***buffer strips and screening***.

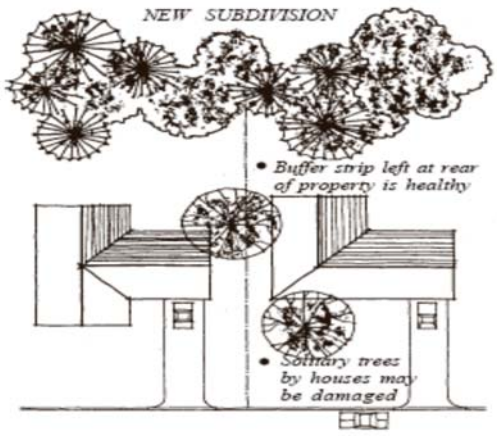
These minimum widths are usually considered adequate to retain the windfirm trees and the visual screening effect of the forest. Strips of vegetation less than 15 metres wide are subject to major windfall and stress induced by sun exposure. Retaining individual trees is feasible in a mixed forest, but species should be carefully selected.

- Most conifers, birch, alder and maples, do not adapt well to changes in their surroundings. Only the healthiest specimens should be retained as individuals.

Single-species Forest Stands

Retaining mature, even-aged single-species stands or groups of trees is ***seldom effective in the Pacific Northwest***.

- Large areas of Douglas Fir, 30 metres or more wide, can be effective buffer strips or natural areas, provided careful planning is done.
- Retaining mature individual specimens after clearing a closely grown-single-species forest stand ***is not recommended***. These trees are prone to windfall and on most conifers, branches are absent from the lower 2/3 of the trunk.
- Younger trees with branches close to the ground are often well suited for retention.



Which trees should be saved?

After analyzing the forest character, a professional should examine individual trees.

Trees must be healthy and have a good life expectancy if a building or development is to feature them. Younger trees are often more adaptable to the changes brought by development than mature specimens.

- Evaluate all the trees on a proposed development site. Consider the individual tree's location, species, future size, age and vigor.
- Inspect the site for hazardous trees and dangerous limbs. Trained personnel should remove dead and hazardous trees so that surrounding retained trees are not damaged.
- Qualified experts should treat trees with problem limbs.

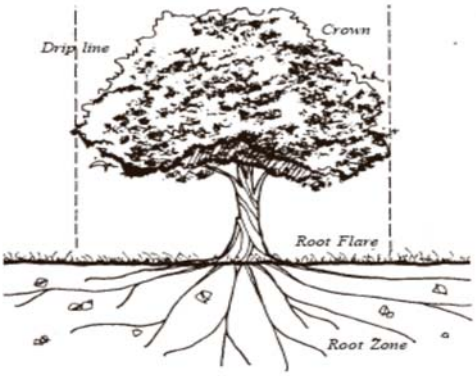
The retained trees should then be protected during construction and site development.

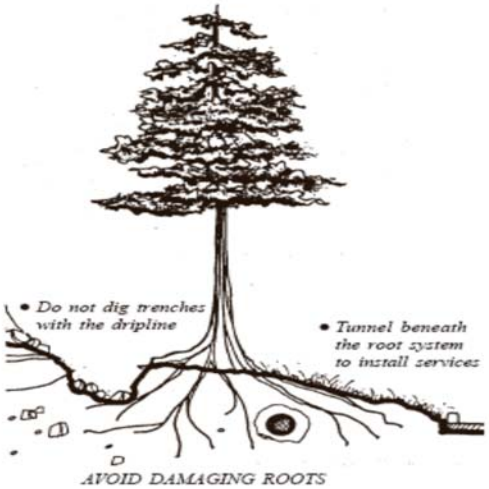
It is advisable to remove trees that are too damaged or are unsuitable for retention, and to replace them with new native specimens. Attempts to revive mature native trees damaged by clearing are usually not fruitful. In some cases, it may be cheaper, safer and more effective to replace existing trees with new specimens.

A professional can assess the dollar value of trees that have been damaged or removed inadvertently. A guide to tree valuation methods has been published by the International Society of Arboriculture.

How do I protect native trees for retention?

- ***Consult*** a professional to develop a landscape plan and site management strategy that balances the desire for neat, manicured lots, and the rougher-looking native understory that enhances the retained trees.
- ***Modify*** building sitings, roads and service alignments early to minimize interference with the trees and roots. Plan for tree retention while planning for development.
- ***Avoid*** unnecessary damage to trees with explicit contract drawings and specifications. Explain where debris disposal is to occur and outline accepted felling and bulldozing techniques.
- **Designate** retention zones with temporary fencing and a clear system of flagging to protect specimens from bulldozing, felling operations, equipment movement and storage, and the dumping of toxic wastes. Use appropriate equipment for clearing operations.
- ***Cut*** trees at the base, near the ground. Grind and chip the stumps in place, instead of pulling them out. This protects the roots of those trees that are to remain.
- ***Protect*** desired trees by clearing sites with the following methods. The first method leaves areas of trees and shrubs scheduled for removal until construction is complete, to act as a buffer and protect those trees designated to remain. The second method leaves small trees and shrubs in retention zones, but removes all hazardous trees from the zone. New specimens are planted to replace the removed trees.
- ***Protect*** all trees from soil compaction and changes of grade within their drip line. Provide tree wells or retaining walls if cut or fill is necessary. If solid disturbance cannot be avoided, remove the tree. It is better to replant than to face the dangers of a dying tree years later.
- ***Avoid*** disturbing the soil moisture and drainage near old and large trees that are to remain (or within retention zones). Do not drain site water into tree retention area.



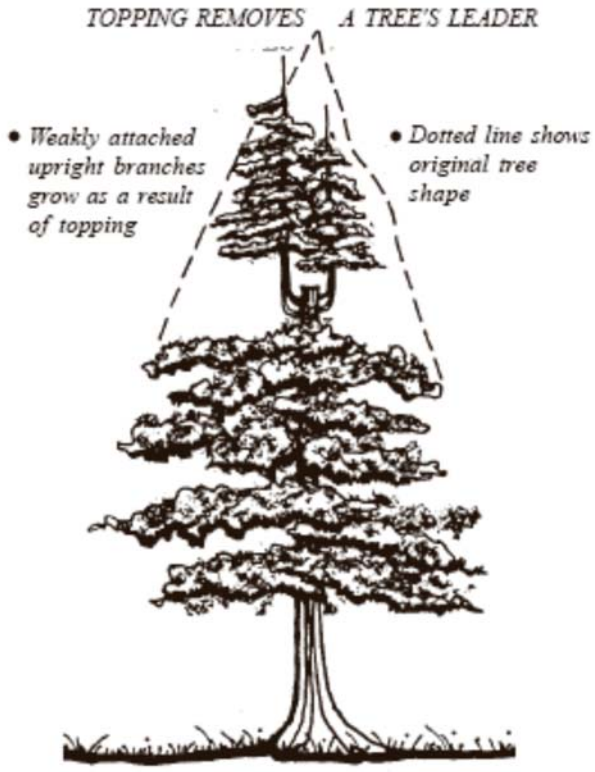


- ***Prevent*** mechanical injury to roots by tunneling beneath tree root systems rather than cutting through them.
- ***Remove*** broken bark from an equipment wound on a trunk by cutting back the edges with a sterilized knife. Do not cut the callus layer. Fertilizer and water the tree to improve its vigor.
- ***Remove*** lawns from beneath native forest trees, as grass competes with the tree for water and nutrients. Apply a 7 - 10 cm deep layer of leaf mould or bark mulch around the base of the tree to the dripline. After the mulch has killed the grass, the "litter zone" should be maintained grass-free, to provide continued protection for the tree.

Is topping recommended?

Topping is the removal or cutting back of a mature tree's leader or large branches. Trees are often topped to prevent interference with overhead utility lines or views. Topping is also done when trees reach a height that people consider unsafe. Thinning and shaping of branches is a good alternative to topping, although it is more expensive in the short terms. Topping often causes long-term maintenance problems and *is generally not recommended*. Topping results in a truncated shape and unsightly branch stubs that seldom heal. It stimulates the regrowth of dense, upright branches that are weakly attached and vulnerable to wind ad snow damage. Sometime, however, topping is the only solution to saving at least part of a native tree. In these cases, it is a legitimate means to retain woodland character, provided proper techniques are used. Cut no more than one-third of the canopy and shape the tree to help keep its overall quality. Cut stems at a slant. Topping usually looks better on cedar trees than on firs or hemlock.

Topping is not the cure for excessive height growth. In conifers, one or more aggressive side branches take over as the leader. In deciduous trees, suckers grow along remaining branch stubs and rapidly compensate for the lost tissue. A topped deciduous tree grows back to its original height faster and denser than a properly pruned tree. When it is time to top, it is often time to remove the tree that has outgrown its location and replant with a smaller species.



Ensuring Safety

All development sites should be inspected for hazardous trees before construction begins. Take the utmost precautions throughout development to protect the trees designated to remain on site. (An injured tree is subject to windfall and sunscald and it poses a potential danger to both life and property.).

Professionals should plan tree retention, but no one can predict exactly which trees are completely safe. Single trees, and those along retention edges, are always prone to windfall unless careful planning and construction precautions have been taken. If there is doubt about a tree's health or stability, it should be removed. Builders and homeowners should be made aware of the requirements of safe native tree retention. Discuss the liability questions relating to tree safety before starting tree retention work.

Why do some trees die?

Retained trees that eventually die are frequently the victims of a slow death by injury inflicted during the site clearance and construction operations. Causes include ***soil compaction, abrasion and injury to the trunk, branch breakage, cut or fill around the tree and disruption of water supply.*** Symptoms include the yellowing of foliage, reduced leaf development twig dieback, death of secondary branches and death of the terminal 3 - 5 metre on primary branches.

Soil Compaction

- Compaction of the ground within the dripline ***reduces the air space*** within the soil. Soil aeration is connected to the overall health of the tree's roots.

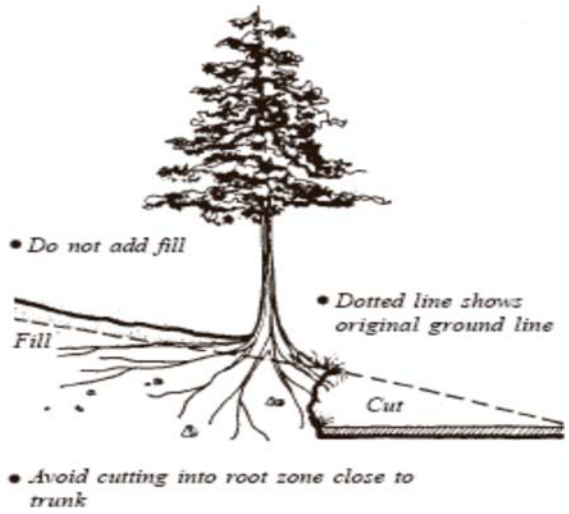
Abrasion and Injury

- A single equipment wound on a trunk will not kill a tree, but it can weaken the tree by providing an entry point for insects, fungi or bacteria. Native tree species have different susceptibilities to wood decay fungi. All deciduous species, Western Hemlock and true firs deteriorate rapidly. Spruce, larch, pines, and Douglas-fir deteriorates less rapidly. Western Red Cedar and Yellow Cedar deteriorate slowly.

- Wounds that circle the trunk cause death by cutting the growing tissue and interrupting the movement of water and nutrients.

Change in water supply

- Trees may die if the water level around the root zone is changed.



Cut or Fill

- Roots are seriously damaged when they are ***severed*** during excavation.

- Extensive damage occurs to the roots when as little as 10 cm of fill is ***piled*** or ***spread*** on top of the existing grade, over the root zone (within the dripline) and around the trunk. Thin layers (up to 5 cm) of gravelly soil or sand are better than clay soil if fill around roots is unavoidable.

Assessing a tree's health - what to look for

- Dead twigs or branches and crown dieback may be a symptom of root damage, infections, or soil compaction.

- Make sure that roots show a gentle spread from the base of the trunk outwards. If root flares cannot be seen, the roots may have been buried by fill.

- Multiple trunk gashes and scars usually indicate careless construction and may lead to the death of a tree.

- New, large multiple pruning scars on a trunk may leave the tree open to infection, if proper techniques were not employed.

- Loose bark at the base of a tree may indicate mechanical damage and potential future decay. Examine the trees carefully. Wounds that circle the trunk cause death.

- Pavement over the root zone and up to the trunk cuts off air to the roots and stresses the tree often leading to death.

- Standing water indicates poor drainage and where trees are present, root rot can result. Water flow may have changed with soil compaction and construction.

Caring for native trees

- ***Leave*** wooded lots in a natural or near-natural state for ease of maintenance. When understorey plants do not exist, plant young, shade-tolerant native tree, shrub or fern species.

- ***Remove*** deadfall or underbrush only if a safety or fire hazard exists. Deadwood and shrub growth contribute to the health of tree retention zones.

- ***Thin*** new growth that is too thick or is hindering tree growth. Remove trees carefully to avoid damage to other plants.

- ***Treat*** declining native trees immediately. Prune judiciously, water and feed with phosphate-rich fertilizer to stimulate root growth. Avoid the use of nitrogen fertilizers that stimulate foliage growth and further stress the trees.

- ***Water*** trees several times during prolonged dry periods, but avoid overwatering.

Species retention potential

All native tree species are suitable for retention if site conditions are appropriate. Some species are more prone to windfall or are best retained in large groups. The species listed below are only some of the common varieties found in the Pacific Northwest. They are listed in generally declining suitability for retention.

Coniferous Trees

WESTERN RED CEDAR (High)
Thuja plicata
Identification: Grows to 40 m. Scalelike leaves. Retention Capability: Relatively windfirm and well suited to individual tree retention. Flag small and moderate sized specimens for retention. Inhabits wetter sites with deep moist soils. The Cedar's full branching habit increases is aesthetic value. Adapts to topping better than firs or hemlocks. Yellow Cedar (Chamaecyparis nootkatensis) has similar retention potential.

DOUGLAS FIR (High)
Pseudolsuga menziesii
Identification: Grows to 60 to 90 m. Needles are set densely around twigs. Bark is grey and rough with deep, wide cracks. Retention Capacity. The most windfirm of coastal coniferous species. Younger specimens are considered ideal for retention. The thick bark is fairly resistant to damage and the relatively deep root system is beneficial during construction. Retention of single, large specimens may be hazardous and is not recommended. Older trees are prone to wind breakage and large branch loss. Grand Fir (Abies grandis) has similar retention potential.

WESTERN HEMLOCK (Moderate-Low)
Tsuga Heterophylla
Identification: Growth to 45 m with a distinctive dropping leader. Needles have rounded tips.
Retention Capability: Prone to windfall when left as an individual. Large trees should not be left adjacent to buildings, but young trees may be retained. Trees up to 9 m tall, although not necessarily windfirm, do not present a serious hazard. Retain in clumps or zones 30 m or more wide. Hemlock is prone to fungal infections and dwarf mistletoe.

Deciduous Trees

BIG-LEAF MAPLE (High
Acer macrophyllum
Identification: large tree to 30 m.
Retention Capability: Can be retained as individual specimens. Assess the health of crowns as this species is prone to crown and branch dieback.

VINE MAPLE (High)
Acer circinatum
Identification: Small to medium height tree from 10 to 12 m tall. Can be multi-stemmed or single stemmed.
Retention Capability: Retain clumps if their size is sufficient to create a massing effect. Retained as an understory plant for fall colour and to protect root zone of larger trees.

PACIFIC FLOWERING DOGWOOD (High)
Cornus nuttallii
Identification: Medium tall tree to 18m. Retention Capability: The Dogwood is BC's provincial flower and as a protected species, should be retained wherever possible. Protect root zone during construction.

PAPER BIRCH (Moderate)
Betula papyrifera
Identification: Medium tall tree to 18 or 20 m. Bark is creamy white and peels off in thin papery layers.
Retention Capability: Prone to sunscald. Only good in groups. Will not usually survive unless left with other trees around it.

RED ALDER (Low-Moderate)
Alnus rubra
Identification: Medium tall tree to 12 or 15 m. Bark is grey.
Retention Capability: Limited potential for use as an individual tree, small clump or thin buffer strip. Considered for retention if large areas or strips wider than 30 m are left and edges are appropriately cleared. Large areas may require thinning, underplanting with conifers, or other silvicultural treatment. Red Alder begins to die back at 40 years and is not tolerant of human use impacts on poorly drained soil. Use where quick regeneration or soil improvement is required.

BLACK COTTONWOOD (Low)
Populus trichocarpa
Identification: Tall tree to 50 m in the wild. White cottony seeds released in June.
Retention Capability: large specimens may be hazardous, as they may be prone to breakage or windfall. Best suited for retention in larger stands.