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Considering the Urban Tree: Growing the Life between the Buildings

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Abstract

Urbanization has spawned the Urban Forest, an ecosystem characterized by the presence of trees and related flora, funga and fauna, the soils and landscapes they populate and the air and water resource they coexist with, all in a dynamic association with people and their human settlements. All our urban trees originate in a forest somewhere in the world. The challenges of integrating urban-tolerant forest trees within the context of human settlements generated Urban Forestry, melding a forest ecology foundation and an interdisciplinary expression of science, art and practice with the highly knowledgeable, creative development, implementation and enforcement of an Urban Forest Management Plan. Sustainable forest tree management in a non-forest context requires an understanding of trees' genetic capacities and self-management strategies. To enable those capacities and provide an ecologically sustainable environment in the urban spaces and places we are asking these forest trees to exist, self-management strategies must form the basis for our planning and management approach. As urbanization expands, ecologically based planning and management are paramount. Rather than thinking planting, we need to think growing. Rather than trunk or branches or roots, the focus must be the entirety. This essay advocates consideration of the tree, turning the science and art of the Urban Forestry practice into innovative planning and management strategies that grow urban trees well into maturity – enhancing their ability to contribute to a healthy, sustainable urban ecosystem for all its occupants.

Keywords: Urban Forestry, urbanization, ecosystem, sustainable planning and management, tree health, urban environment
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> "Respect trees –
> trees have dignity too.
> Learn about trees and their associates
> so that you can help make better decisions
> for their long-term, high-quality survival."
> *Shigo on Trees, Tree Care Industry, February 1996*

Our growing urbanization footprint has become synonymous with spatial development. Over the passing decades of accelerated urban expansion and environmental upheaval, it has also spawned the understanding that we cannot exist without putting back into our denatured urban environment a part of the nature that we so definitively removed.

This realization initiated what has come to be known as the Urban Forest, an ecosystem characterized by the presence of trees and related flora, funga and fauna, the soils and landscapes they populate and the air and water resource they coexist with, all in a dynamic association with people and their human settlements – the built environment (Zürcher 2022).

The basis for Urban Forest Management Strategies

Urban Forestry began its existence long before this term was first used in 1965 by Erik Jorgensen (University of Toronto; Jorgensen 1967, Jorgensen 1986). Dating as far back as the 1790s, the American public was requesting the planting of trees in their growing cities. Centuries of urban tree management experience have led to the current-day strategies being used, not just in North America, the birthplace of Urban Forestry, but globally.

The global diversity of the Urban Forest within that built environment includes trees in a variety of contexts: traditional forest remnants, open landscapes and city streets. The ability of a tree to grow, be it in the forest or a city street, is the combined interaction of its genetic potential – capacity – and the surrounding environmental conditions that enable those capacities – ability. All the trees planted in our open landscapes and city streets originate in a forest somewhere in the world, endowed with the genetic capacity to manage themselves as they had for millennia before human arrival. They are forest trees and, regardless of where they are planted, they still retain their forest genetics. Because they are able to tolerate urban conditions, these urban-tolerant forest trees have been asked to co-exist with us in our urban environment. But tolerance is not preference, and this understanding has made it clear that if both trees and people are to thrive, people need to embrace the urban-tree organism both above and below ground – what it is, what it needs to thrive and how we can best provide that (Zürcher 2021).

Addressing the challenge of integrating urban trees and their essential needs into the context of dynamic human demands has precipitated the conception, evolution and establishment of Urban Forestry – the melding of a forest ecology foundation and an interdisciplinary expression of science, art, theory and practice with the highly knowledgeable, creative development of an Urban Forest Management Plan (UFMP).

The forest ecosystem foundation

Sustainable forest tree management in a non-forest context requires a grasp of trees' genetic origins, evolution and self-management strategies within a forest system as the basis for how we consider urban trees in relation to our human constructs. What exactly is a forest ecosystem, and how does that drive the genetics these trees bring to the urban ecosystem (Zürcher 2022)?

A **forest ecosystem** is a complex adaptive community of trees and all their associates – related flora, funga, fauna and, most importantly, soil with a profile consisting of an organic layer and horizons A (topsoil), B (subsoil) and C (parent material), supporting a mycorrhizal network and a functioning microbial community, providing air, water and the nutrients, macro and micro, all associates in the forest community depend on, either directly or indirectly.

Forests are a process of evolution. They don't happen in a day, a week, a year. They occur over millennia, beginning with the specific soils they populate, formed by the weathering of parent material, specific to the site, combined with the forest's detritus, processed in the A horizon.

Forests evolve in direct relationship to their environment, e.g. temperature, soil's texture, structure and pH, the availability of light and water. They will all dictate what species are growing and where (higher or lower elevations, coastal or inland, temperate or tropical, edge or interior).

Although a forest may consist of many different species of trees, space above ground is shared in competition while space below ground is shared in community. Trees have evolved to grow within community associations that depend on a communal rooting landscape – a mycorrhizal network providing inter-species connections, enhancing self-regulating mechanisms such as nutrient sharing.

Photosynthesis delivers the fuel driving the entire system's functions, providing the energy that enables processes such as respiration. While photosynthesis is traditionally considered a function of leaves, trees have other photosynthetic capabilities. Trees also photosynthesize through their bark (woody tissue photosynthesis) (Pfanz et al 2002). The active chloroplast population is located mostly in the cortex, just under the bark, as well as in ray cells and even in pith. Woody tissue photosynthesis not only supports bud development, root growth and carbohydrate allocation, it allows the tree to "re-fix" very high internal concentrations of respired CO_2.

Tree architecture is reiterative, based on the arrangement of fundamental parts such as branches, and thus part of the individual tree's adaptation to its evolving environment. Individual trees, growing within a forest system, will adapt their dynamic architecture, in tree time, to prevailing environmental conditions and inter-spatial relationships affecting access to light, crown space or gravitational demands on structure.

As **forest trees** gain in height and competition for crown space increases, their lowest branches may receive less and less light and their ability to maintain their own needs and contribute to the tree's overall upkeep may be greatly reduced. A tree may then initiate branch shedding by forming a basal protection zone, literally divorcing the branch from resources supplied by the tree, ensuring its death. Before the dying branch is shed, all usable resources stored in the branch will be reclaimed by the tree.

Trees grow with their root collar / buttress roots above the soil line, as do all parts of the tree that are covered with bark. Bark requires access to air and light in order to function.

An **individual forest tree's** root system begins at the trunk-root transition zone, referred to as the root collar, with the development of at least one first-order root in each of the four cardinal directions. These large woody first-order roots, forming the root system's perennial framework, are primarily responsible for structural support, transport and storage. They branch out horizontally into the surrounding soil, decreasing their diameter in the zone of rapid taper as they grow into fine non-woody roots, responsible, along with their mycorrhizae associate, for the uptake of water and water-soluble nutrients. Growth is opportunistic. Root exploration of the underground landscape depends on the presence of oxygen, water and nutrient availability. Almost all of this extension activity occurs within the top meter of soil with fibrous roots in the uppermost portion of this range and even into the decomposing forest floor litter, extending a minimum of 2.5 to 3 times the width of the crown, depending on species and environment.

Forest soil is always covered by related flora, leaf litter or other organic Forest detritus – a constant recycling of organic resources. A healthy and diverse soil ecosystem – the teaming life contained within forest soils – is the foundation for forest health and diversity.

The life between the buildings

We now have urban trees' forest ecology foundation, forming the basis for growing the life between the buildings. To enable trees' capacities and provide a tree-friendly, ecologically sustainable environment in the urban spaces and places we are asking urban-tolerant forest trees to exist, we need to use all those self-management strategies to inform Urban Forest planning and management. The practice of Urban Forestry within the context of the growing climate crisis, can guide our focus on nature as a quick fix.

As a result, we are witnessing a great deal of interest in tree canopy as a potential solution. But, in our drive to plant, what do we consider when we consider the urban tree? If trees are the life between the buildings, what sort of life are we offering them that actually enables them to grow well into maturity and deliver those wonderful Ecosystem Services (ES) benefits? The concentration on planting quantity rather than growing quality to obtain canopy has further highlighted the critical need for a well-documented, professionally informed UFMP (Zürcher 2022).

Management criteria and procedures

Comprehensive Urban Forest management criteria for trees in city streets and open landscapes must include the following elements and their well-documented procedures, based on current Best Management Practices (BMPs).

1. GPS/GIS ground-based complete tree inventory combined with an i-Tree Eco ecosystem services quantification[1]

The built environment challenge our urban-tolerant forest trees face requires an assessment of what already exists and must include the following data, normally collected over a 3–5 year period:

1. municipal address plus GPS coordinates for GIS mapping,
2. planting site specifics including environmental and/or abiotic constraints,
3. genus, species as well as variety or cultivar if known,
4. general tree metrics – diameter at breast height, total tree height, crown width,
5. condition-rating including annual shoot extension, foliage transparency/color, percentage of live tree canopy, major structural defects / mechanical injuries, signs of pathogens or disease,
6. at planting, tree data for newly planted trees,
7. tree inventory data, collected during public infrastructure projects, to update existing inventory.

2. Developing an ecologically based UFMP

Existing tree data gathered during the complete inventory provides an essential overview as well as an in-depth basis for Urban Forest planning decisions that will inform and dictate how the resource needs to be managed from an ecological "do no harm" perspective. The UFMP must consider the entire urban ecosystem and address and resolve the paradox between sustaining the ecosystem while accommodating human needs and demands.

3. Spatial resource evaluation and preparation details

Any assessment of a proposed planting site must include a focus on reducing the extent of impervious surfaces and sealed soil and improving the living soil organism and its functions, based on forest ecology criteria. Where an urban tree will be planted and asked to exist is the first essential element in the art of growing an urban tree. It must be evaluated for environmental conditions and adapted and prepared for long-term tree growth. Evaluation of the urban spatial resource being considered for planting must include (Zürcher 2021):

1. What type of planting area is it (open landscape, tree lawn, curbside cutout)?
2. What are the proposed dimensions of the tree area?
3. Are there grading issues (too high or too low)?
4. Are there overhead wires or underground utilities?

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1 www.itreetools.org/tools/i-tree-eco

5. What is the proximity to grey infrastructure (curb, pavement, buildings)?
6. Does pavement already exist? What are types of paving material and its condition? Does the new planting include sidewalk replacement?
7. If there are buildings, how tall are they? What is the proposed planting site's orientation to the buildings and to the street (distance, direction)?
8. Will there be re-reflected heat load issues, or is the site particularly windy causing excessive transpiration / droughty conditions?
9. What is the daylight availability throughout the growing season?

While the site must support canopy, planning criteria must recognize that over 50% of the processes tree structure and function depend on take place within the root zone. Essential planning must include strategies such as a well-researched, designed, produced and installed structural soil that provides roots access to the engineered substrate under paved surfaces. This increases accessible soil volume, enabling root system functionality and growth. Structural soil can also be used as a retrofit, improving the existing environment, addressing tree-paving conflicts that impact and reduce tree longevity.

Specify alternative paving material such as dry-laid, porous, pervious or permeable pavers to increase gas and moisture exchange, water filtration and infiltration, facilitating a living soil and improving stormwater runoff management and water quality.

4. Tree selection

Trees are selected based on BMP criteria for species-specific tree structure and architecture as well as nursery cultivation practices. Once the spatial resource has been evaluated and growth accommodation strategies planned, a site-specific tree list can be developed. While ornamental attributes drive design, the site's ability to support long-term, healthy growth must form the basis for selecting a tree that can thrive in the proposed site.

1. Hardiness: based on specific provenance as genetic/sub-species variables can affect survivability; a grafted root stock must be cold hardy for the site being planted.
2. Soil preferences: site soil conditions must match selected tree preferences for moisture, drainage and soil characteristics (structure, texture, pH). Site conditions such as air pollution as well as the use of de-icing salts must be considered to ensure tolerance for such conditions.
3. Sites with unresolved restricted rooting space must avoid species with known root space issues such as *Tilia* or *Fagus*.
4. Light preferences: the amount of direct sunlight required in order to grow the selected tree into maturity (full sun: direct sunlight for a minimum of 6 hours per day; partial shade: 3–6 hours of direct sunlight per day; shade: less than 3 hours of direct sunlight per day).
5. Planting schedule: avoid selecting trees for fall planting that should not be dug in the fall, such as conifers or Liquidambar (Zürcher 2007).
6. Community interests/concerns: consideration of a community's health concerns, e.g. asthma, or interests, e.g. increasing pollinator habitat.

Trees shall be selected and tagged by a tree expert or equivalent at a growing nursery located within the cold/heat hardiness zone of the location to be planted. During the examination of any tree being considered, the following points must be taken into account:

1. The tree's crown must consist of healthy trunk, branches, buds, characteristic of the species – trees with co-dominant stems and/or included bark should never be tagged; a grafted tree's graft union must be visible – if planted too deep, the grafted portion can begin to root, weakening the graft structure as well as disease resistance.
2. Examine the trunk-root area for possible girdling roots, damage or decay.
3. There must be at least four permanent first-order roots within the top 7.5 cm of soil (locate with a surveyor's pin).
4. Mark tagged trees on the north side for transplanting orientation.

Understanding nursery production practices will facilitate selection and harvesting of quality material:

1. Soil creep (soil mounded up against the trunk) results in increased depth of roots, reducing the number of structural and fibrous roots that accompany the root ball. Before digging, the nursery must be required to remove this surplus soil, down to the root collar, ensuring the harvested ball has roots where they should be and not at the bottom of the ball.
2. Heading back trees to stimulate branching can result in undesirable groupings of branches originating from the same point in the tree. Only select trees that have branching true to species' characteristic architecture.
3. Select field-grown or bare root material, whenever possible. Container-grown production techniques have not yet resolved root circling and girdling issues adequately enough to ensure quality standards can be met (Figure 1).

5. Planting procedures based on current BMPs

1. Prior to digging a hole, locate the root collar, and measure root ball height, ensuring the root collar is above planting grade and the ground underneath the ball will remain undisturbed.
2. Slope planting hole sides, so the top of the hole is a minimum of 2.5–3 times the root ball width;

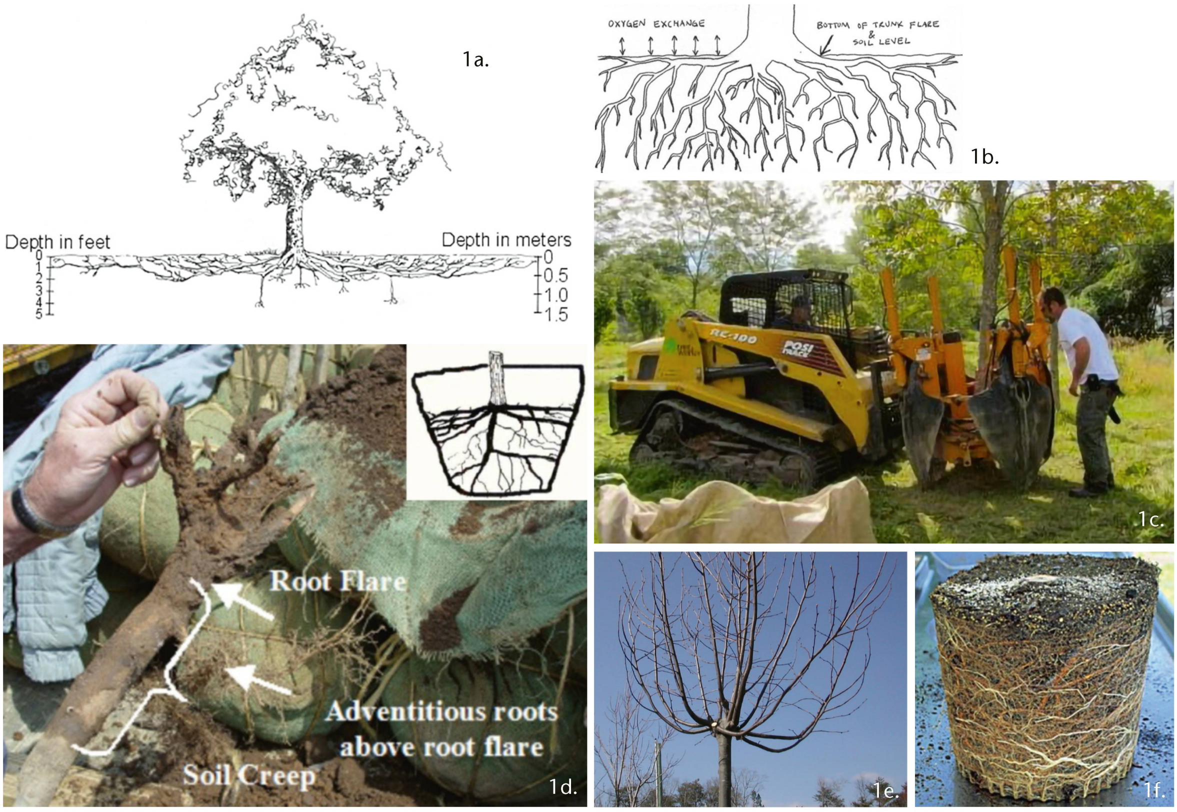

Fig. 1 *Tree growth vs nursery production: a) tree growth above and below ground; b) tree-soil relationship; c) tree spade set to dig; d) soil mounding with roots too deep – nc state u extension; e) heading cuts; f) root problems with container-grown trees. Credits: Harris, Naomi Zürcher, heartwoodtreecompany.com/blog/ho2oiebnedkg6rozdn75azih6bgghm, hort.ifas.ufl.edu*

store removed soil on jute; do not break up soil aggregates.

3. Prune only damaged branches back to a lateral before lowering the tree into the planting hole.

4. Lift the tree by its root ball, never the trunk; center the tree plumb in the hole with the marked side oriented north; backfill with retained soil to one third of the root ball.

5. Cut the wire basket if present; untie and cut jute, removing both to the backfilled height.

6. Rough up planting hole sides as well as the root ball to reduce the soil interface; do not fracture the root ball.

7. Water in backfilled soil; continue to backfill in thirds, watering in each third; do not place any backfill on the top of the root ball.

8. Create a soil berm at the root ball's outermost edge, encouraging water to flow into the ball.

9. Staking: rather than above ground, opt for an underground, decomposing root ball staple to only stabilize the root ball without impeding movement in the above ground part of the tree, necessary for development of trunk taper.

10. Install composted chipped bark mulch, 7.5–10 cm deep, 15–30 cm from root collar; thoroughly water in; do not fertilize (Figure 2).

Establishment procedures can help the tree acclimatize to its new location and put on new roots to recoup the loss of 95% of its root system which remained at the nursery and that's only if the root collar is visible:

1. Schedule post-planting watering; Treegators are a proven reliable tool to provide slow, verifiable irrigation to newly planted trees.[2]

2. A composted chipped bark mulch installation must be maintained to mitigate soil compaction and erosion, retain soil moisture, stabilize soil temperature and provide the organic horizon necessary to support a living soil.

6. Tree care and maintenance based on arboricultural BMPs

Our urban-tolerant forest trees possess established self-management abilities. When trees' own strategies are incorporated into the entire management process, we invariably see a reduction in maintenance needs. That said, we also know that urban challenges are a moving target and even the best planning, selection, planting and establishment will still have to deal with maintenance issues requiring thoughtful intervention to ensure the sustainability of a healthy urban tree resource. Maintenance procedures, such as plant health care, pruning or risk assessment as well as potential emergency storm responses or extended drought events must be based on well-established arboricultural

2 www.treegator.com

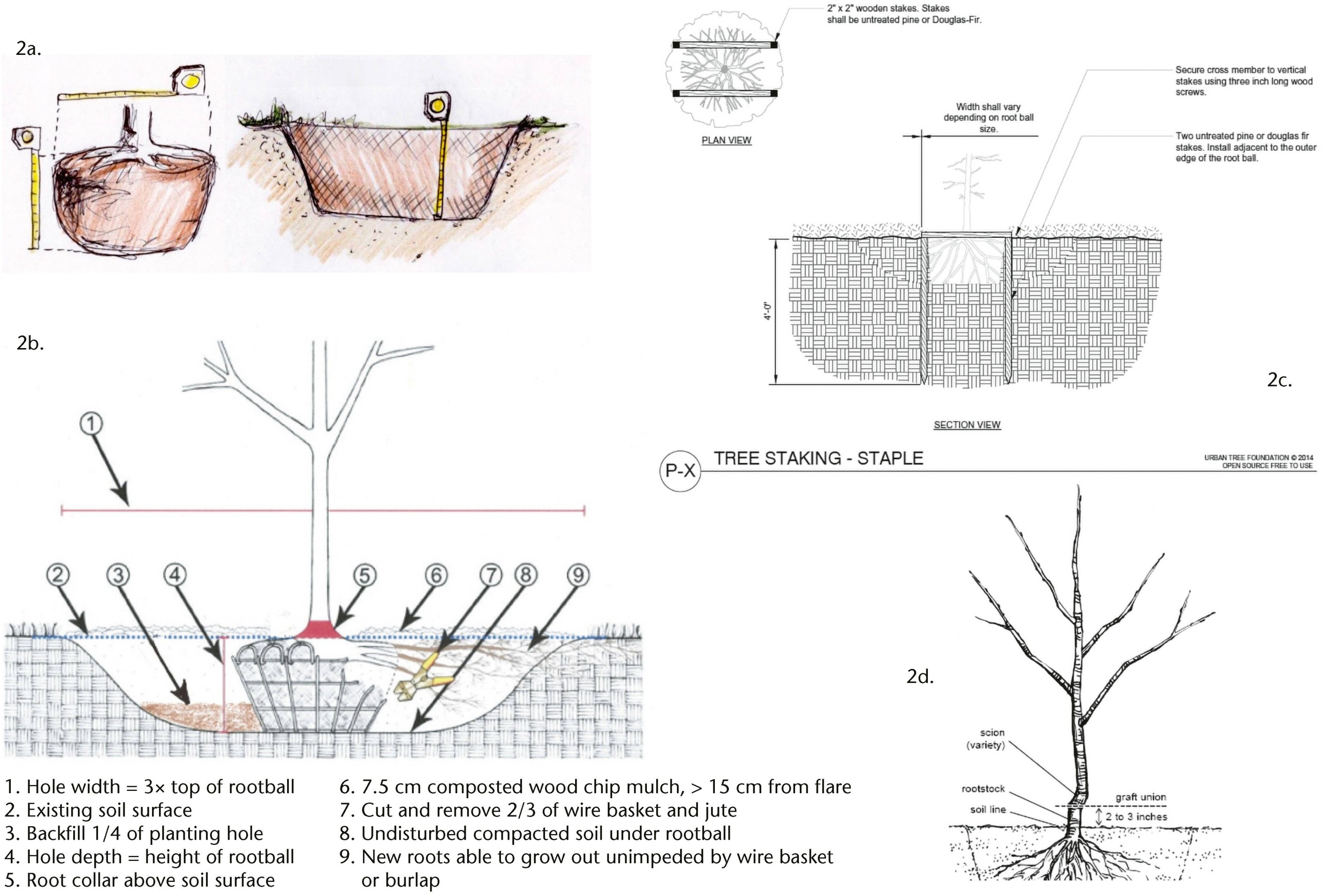

Fig. 2 *Planting procedures: a) locate root collar, measure root ball height to determine planting hole depth; b) planting criteria; c) untreated wood root ball staple to stabilize root ball; d) graft union planting depth. Credits: extension.umaine.edu, gibneyCE.com, urbantree.org, forestkeepers.net*

BMPs as defined and detailed in current scientific literature (e.g. Shigo 1991; Dujesiefken & Liese 2022).

Scheduling elements such as pruning must have a tree health and biodiversity focus as opposed to aesthetics or percentages. The most aesthetically pleasing tree is a vibrantly healthy tree and tree health the primary maintenance goal. In addition, our urban trees support a plethora of diversity, seen and unseen, requiring an awareness of the holistic tree to maintain and sustain that diverse universe.

7. Protection, conservation and retention of urban trees, soil and the landscapes they populate

Tree protection ordinances provide the enforceable foundation for the protection and conservation of the urban tree resource on both public and private lands. They authorize implementation, inspection and enforcement of ordinance responsibilities between related municipal departments. Points that must be included for the protection criteria:

1. Criteria are determined on the basis of diameter at breast height or circumference above ground as well as the inclusion of the protected tree's ecological root footprint, accompanied by a checklist of acceptable as well as unacceptable activities.
2. Protection methodologies to be implemented during the construction design phase must be clearly detailed on plan drawings and accompany building permit applications for all spatial development projects.
3. Violations and resulting mitigation / cost of cure must be defined.

8. Planning/managing spatial development for the protection and conservation of trees and their landscapes

Development, adoption, implementation and enforcement of Building WITH Trees© protocols, specifications, procedures, and the oversight they require are the tools that can effectively address potential urban tree impacts: construction projects, sidewalk repair, street reconstruction, above and below ground utility management … wherever spatial development is sharing space with trees and the landscapes they populate (Zürcher 2021, Figure 3).

Building WITH Trees© construction project procedures include:

*Fig. 3 **Building** WITH Trees©: a) tree radar GPR mapping; b) design – trenchless technology; c) pre-construction – pneumatic excavation + root pruning + tree protection zone fencing; d) ground protection mats over mulch; e) radial trenching and detail. Credits: Carsten Glaeser, Naomi Zürcher, Tree Radar*

1. trenchless technology to eliminate tree removals,
2. pneumatic excavation for root pruning to eliminate construction damage,
3. Tree/Landscape Protection Zones with substantial fencing and signage,
4. Ground Protection Mats to access protected landscapes,
5. radial trenching to remediate project soil compaction damage,
6. pre-approved staging and storing located outside treed landscapes,
7. a Project Consulting Arborist / tree expert to oversee the construction build phase.

9. Participatory management programs

Participatory management programs are culturally-inspired citizen science-based participatory programs consisting of stewardship opportunities and local initiatives that support community greening interests. Well-developed, municipally supported programs can connect citizens with professionals and incorporate informed actionable participation in all appropriate aspects of planning and managing the Urban Forest ecosystem. Participatory management programs require a basic understanding of what a tree is, how it grows, what its needs are and how those needs can best be accommodated. The municipal entity in charge of the Urban Forest resource can, through its website and in-person workshops, make this knowledge available and accessible in support of community endeavors.

Final considerations and concluding thoughts

While spatial development must occur, the climate crisis is a reality and thus, ecologically based planning and management are paramount. Rather than thinking planting quantity, we need to think growing quality. Rather than a focus on trunk or branches or roots, the focus must be on the entirety. What is needed is consideration of that life between the buildings, turning the science, art and theory of Urban Forestry practice into the innovative planning and management strategies required to support and sustain that life – growing our urban trees well into maturity and thus supporting and sustaining the life inside the buildings. ■

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Literature

DUJESIEFKEN D, LIESE W (2022) Das CODIT-Prinzip – Baumbiologie und Baumpflege. Braunschweig: Haymarket Media GmbH.

JORGENSON E (1967) Urban forestry: Some problems and proposals. Paper prepared for the ninth Commonwealth Forestry Conference. Toronto: Faculty of Forestry, University of Toronto. 10 p.

JORGENSON E (1986) Urban Forestry in the Rearview Mirror. Int J Urban For 10 (3): 177–190. doi: 10.1080/03071375.1986.9746750

PFANZ H, ASCHAN G, LANGENFELD-HEYSER R, WITTMANN C, LOOSE M (2002) Ecology and ecophysiology of tree stems: corticular and wood photosynthesis. Naturwissenschaften 89: 147–162. doi: 10.1007/s00114-002-0309-z

SHIGO A (1991) Modern Arboriculture: A Systems Approach to the Care of Trees and Their Associates. Snohomish: Shigo & Trees Assoc.

ZÜRCHER N (2007) Noteworthy requirements for conifer and hardwood selection. Technical report. New York: NYC Root Zone. 6 p. doi: 10.13140/RG.2.2.16467.37921

ZÜRCHER N (2021) In Consideration of the Tree: The Importance of Structure and Function in the Realization of Ecological Design. In: Catalano C, Andreucci MB, Guarino R, Bretzel F, Leone M, Pasta S, editors. Urban Services to Ecosystems. Future City 17. Cham: Springer. pp. 509–527. doi: 10.1007/978-3-030-75929-2_27

ZÜRCHER N (2022) Connecting Trees with People – Synergistic Strategies for Growing the Urban Forest. Future Cities Series 16. Cham: Springer Nature. 223 p. ISBN 978-3-030-94533-6

Überlegungen zum Stadtbaum: das Leben zwischen den Gebäuden wachsen lassen

Die Urbanisierung hat die Urban Forests geschaffen. Diese Ökosysteme sind charakterisiert durch das Vorhandensein von Bäumen und der mit ihnen verbundenen Flora, Pilzen und Fauna, von Böden und Landschaften, die sie bevölkern, und von Luft- und Wasserressourcen, mit denen sie in einer dynamischen Beziehung zu Menschen und ihren Siedlungen stehen. Alle Stadtbäume haben ihren Ursprung in einem Wald irgendwo auf der Welt. Die Herausforderungen, die sich aus der Integration städtischer, toleranter Waldbäume in menschliche Siedlungen ergeben, haben die Urban Forestry hervorgebracht, die eine forstökologische Grundlage und interdisziplinäre Ansätze aus Wissenschaft, Kunst und Praxis mit fachkundigen, kreativen Entwicklungen und der Umsetzung von städtischen Waldbewirtschaftungsplänen verbindet. Die nachhaltige Bewirtschaftung von Waldbäumen in einem nicht forstwirtschaftlichen Kontext erfordert ein Verständnis der genetischen Ressourcen der Bäume und ihrer Selbstverwaltungsstrategien. Um diese Fähigkeiten zu entfalten und ein ökologisch nachhaltiges Umfeld in den städtischen Räumen und an den Orten zu schaffen, an denen der Waldbaum existieren soll, müssen Selbstmanagementstrategien die Grundlage für unseren Planungs- und Bewirtschaftungsansatz bilden. Angesichts der zunehmenden Verstädterung ist eine ökologisch orientierte Planung und Bewirtschaftung von grösster Bedeutung. Anstatt an Pflanzung zu denken, müssen wir an Wachstum denken. Anstatt an den Stamm, die Äste oder die Wurzeln zu denken, muss der Fokus auf die Gesamtheit gerichtet werden. Dieser Essay plädiert dafür, den Baum gesamtheitlich zu betrachten und die Wissenschaft und die Kunst der städtischen Forstwirtschaft in innovative Planungs- und Bewirtschaftungsstrategien umzuwandeln, die Stadtbäume bis zur Reife wachsen lassen und so ihre Fähigkeit verbessern, zu einem gesunden, nachhaltigen städtischen Ökosystem für alle Bewohner beizutragen.

Réflexions sur l’arbre urbain: permettre à la vie de pousser entre les bâtis

L’urbanisation a donné naissance aux forêts urbaines. Ces écosystèmes se caractérisent par la présence d’arbres et de leur flore, champignons et faune associés, de sols et de paysages qu’ils colonisent, et de ressources en air et en eau avec lesquelles ils entretiennent une relation dynamique par rapport aux hommes et à leurs habitations. Tous les arbres urbains trouvent leur origine dans une forêt quelque part dans le monde. Les défis posés par l’intégration d’arbres forestiers urbains tolérants dans les agglomérations humaines ont donné naissance à la foresterie urbaine, qui combine une base d’écologie forestière et des approches interdisciplinaires issues de la science, de l’art et de la pratique avec des développements professionnels et créatifs et la mise en œuvre de plans de gestion forestière urbaine. La gestion durable des arbres forestiers dans un contexte non forestier nécessite une compréhension des ressources génétiques des arbres et de leurs stratégies d’autogestion. Pour développer ces capacités et créer un environnement écologiquement durable dans les espaces urbains et les lieux où l’arbre forestier est censé exister, les stratégies d’autogestion doivent constituer la base de notre approche de la planification et de la gestion. Compte tenu de l’urbanisation croissante, une planification et une gestion écologiques sont d’une importance capitale. Au lieu de penser à la plantation, nous devons penser à la croissance. Au lieu de penser au tronc, aux branches ou aux racines, il faut se concentrer sur l’ensemble. Cet essai plaide pour que l’on considère l’arbre dans son ensemble et que l’on transforme la science et l’art de la foresterie urbaine en stratégies de planification et de gestion innovantes qui permettent aux arbres urbains de pousser jusqu’à maturité, améliorant ainsi leur capacité à contribuer à un écosystème urbain sain et durable pour tous les citoyens.