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Ryan W. Klein, Andrew K. Koeser, Gail Hansen, Laura A. Warner, Adam G. Dale, and John Watt
Professional Expertise and Its Role in Risk Assessment 234

Abstract. Professional judgment is derived from a person's intuition, training, and level of expertise. When exploring the influence that expertise has on the process of tree risk assessment, it is helpful to approach the topic in relation to its impact across various related fields and disciplines. This paper reviews the effects of arboricultural and tree risk assessment training on the assessor and overall tree risk assessment methodology through the lens of professional judgment and decision making. Additionally, the topic of risk perception is explored based on how it can affect decision making. Concepts and theories related to risk perception are applied to arboriculture and tree risk assessment to provide additional insight into how subjectivity and personal bias may affect recommendations, mitigation, and the overall management of our urban forests. The review finds that an individual's perception of a risk can be equally as influential as the reality of the risk on the decision-making process, recommendations, and subsequent outcomes of an assessment. Furthermore, experts, similar to novices, are susceptible to the influence of perceived risk. Much of the available research has suggested that the acquisition of professional expertise (i.e., previous experience, training, and accreditation) can result in decision making that is more closely tied to the reality of a risk. Ultimately, a great deal remains unknown regarding our understanding of professional expertise and its influence on the tree risk assessment process.

Keywords. Decision Making; Professional Judgment; Risk Perception; Tree Risk Assessment.

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Johanna Deak Sjöman, Andrew Hirons, Nina Bassuk, and Henrik Sjöman
Plant and Wood Area Index of Solitary Trees for Urban Contexts in Nordic Cities 252

Abstract. Background: We present the plant area index (PAI) measurements taken for 63 deciduous broadleaved tree species and 1 deciduous conifer tree species suitable for urban areas in Nordic cities. The aim was to evaluate PAI and wood area index (WAI) of solitary-grown broadleaved tree species and cultivars of the same age in order to present a data resource of individual tree characteristics viewed in summer (PAI) and in winter (WAI). Methods: All trees were planted as individuals in 2001 at the Hørsholm Arboretum in Denmark. The field method included a Digital Plant Canopy Imager where each scan and contrast values were set to consistent values. Results: The results illustrate that solitary trees differ widely in their WAI and PAI and reflect the integrated effects of leaf material and the woody component of tree crowns. The indications also show highly significant ($P < 0.001$) differences between species and genotypes. The WAI had an overall mean of 0.91 ($\pm$ 0.03), ranging from *Tilia platyphyllos* 'Orebro' with a WAI of 0.32 ($\pm$ 0.04) to *Carpinus betulus* 'Fastigiata' with a WAI of 1.94 ($\pm$ 0.09). The lowest mean PAI in the data set was *Fraxinus angustifolia* 'Raywood' with a PAI of 1.93 ($\pm$ 0.05), whereas *Acer campestre* 'Kuglennar' represents the cultivar with the largest PAI of 8.15 ($\pm$ 0.14). Conclusions: Understanding how this variation in crown architectural structure changes over the year can be applied to climate responsive design and microclimate modeling where plant and wood area index of solitary-grown trees in urban contexts are of interest.

Keywords. Climate Responsive Design; Leaf Area Index (LAI); Plant Area Index (PAI); Solitary Trees; Urban Forest Wood Area Index (WAI); Urban Trees.

Cecil C. Konijnendijk, Lorien Nesbitt, and Zach Wirtz
Urban Forest Governance in the Face of Pulse Disturbances—Canadian Experiences 267

Abstract. The sustainable provision of urban forest benefits can be threatened by the occurrence of sudden, major disturbance events, such as forest fires, insect outbreaks, and extreme weather events, which are considered to be "pulse" disturbance events from a socio-ecological systems perspective. Sound urban forestry programs are needed to prepare for these disturbances and reduce their negative impacts. To investigate

the role of governance in building more resilient urban forest socio-ecological systems, the relation between pulse disturbances and urban forest governance was studied in 4 Canadian cities. Our study of local urban forestry included expert interviews with local urban forest governance actors, document analysis, and site visits. The Policy Arrangement Approach was applied to structure and analyse urban forest governance. Findings show that all cities had seen a development of their urban forestry programs and governance over time, such as development of staff and formal plans, as well as alliances with key partners. Pulse disturbances seem to have played an important role in the development and sometimes reorientation of urban forestry programs. Although disturbances often had devastating impacts, having a strong urban forestry program in place, including strong alliances with, e.g., industry partners or NGOs, was considered important for handling the aftermath of these events. Efforts had also been made to be better prepared for future disturbances through further professionalisation, development of plans, guidelines, and best practices, capacity building through partnerships, and setting up better real-life information systems in support of decision making. Results can inform urban forest governance and urban forestry programs in Canadian cities and elsewhere.

Keywords. Disturbance; Environmental Decision Making; Policy; Pulse Dynamics; Urban Forestry.