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Abstract. The objective of this study was to identify and quantify the hazards present during arboricultural operations. The Occupational Safety and Health Administration Fatality and Catastrophe incident database and other Bureau of Labor Statistic sources were analyzed for arboricultural operation incidents within the 17-year period from 2001 through 2017. There were 865 fatal and 441 nonfatal incidents reviewed from this period. The leading four fatal incidents, from the largest to the smallest number of fatalities, were climber falls, workers struck by a falling tree, workers making indirect contact with an electric current, and workers struck by a falling branch. Climber falls were also the leading incident for severe nonfatal injuries, followed by ground workers struck by a falling branch, workers struck by a chain saw, and falls by aerial device operators. The American National Standards Institute Z133 *American National Standard for Arboricultural Operations—Safety Requirements* establishes safety requirements and recommendations for arboricultural operations in the United States. It addresses common hazard sources and has guidelines to avoid, eliminate, or reduce them. Safety training programs should emphasize the most common hazard sources for fatal and nonfatal incidents and follow the ANSI Z.

Keywords. ANSI Z; Arborist Safety; Hazards; Incidents; Training.

Abstract. We identified relationships between ecosystem services provided by trees and environmental variables, including temperature (°C at ground level and 1.5 m), relative humidity (%), particulate matter (PM_{10}, maximum and average), noise (dBA), and ultraviolet radiation (UV at 1.5 m). This study was carried out in Talca, Chile, a mid-sized city. Measurement locations were selected in three areas based along three main avenues in the center of the city during three different seasons and three different schedules of day, generating 15,515 data in total. In circular plots, with 8 meter radiuses, measurements were recorded at the center and at a point on the perimeter. A correlation matrix was calculated and an ANOVA was conducted with canopy cover, schedule of day, and season as variation sources. The results show a high dispersion, and the correlation matrix that canopy coverage has a weak relationship with variables was studied. The results of the ANOVA showed the least number of significant differences associated with the canopy cover, schedule of day, and season, which showed significant differences for all variables. Tree coverage showed significant differences for all variables using the Tukey Test, with the exception of minimum noise. Plots with greater coverage were associated with increases in the particulate matter and relative humidity and decreases in maximum noise, temperature, and ultraviolet radiation. During mornings, the highest measurements of particulate matter, noise, and relative humidity were reported, whereas temperature maximums occurred at mid-day. The results confirm the importance of urban trees, specifically the canopy coverage, in mitigating negative environmental aspects in urban areas.

Keywords. Ecosystems Services; Humidity; Noise; Solar Radiation; Temperature; Tree Canopy.

Abstract. People's preferences for urban parks are influenced by the spatial and contextual characteristics of spaces, where landscapes form the main body of parks. The present study examined women's preferences for landscape spatial quality indicators (including coherence, mystery, complexity, legibility, prospect, and refuge) in two urban parks. Also, the study explored the impact of socio-economic variables such as

age, income, and education on women's preferences. In this spirit, a photo survey was conducted among 178 women as park users in Tabriz in 2017. Descriptive analysis, factor analysis, and comparison tests such as one-way ANOVA were used to analyze the data. Based on the results, the highest preferences were for mystery, complexity, and prospect. The results also revealed that the preference for landscape spatial quality indicators (LSQIs) varies among different age groups, education levels, and income statuses, where middle-aged women show the highest preference toward all of the LSQIs. Similarly, perception of and preference for landscape were seen to increase with education level, with less educated women demonstrating the lowest preferences for LSQIs in a park environment. Also, women with low and high income levels had the highest preference for mystery, complexity, and prospect of LSQIs. The population of middle-aged residents is increasing, which renders it necessary for special attention to be paid to understanding their opinions and demands for public spaces, such as landscape quality. It was likewise confirmed that users' characteristics should be taken into account in planting design, particularly its spatial configurations in urban parks.

Keywords. Landscape Preference; Landscape Spatial Quality Indicators; Tabriz City; Users Characteristics.

Abstract. Older trees in good health are expected to provide more ecosystem services and equivalent economic values due to their large size. The relationship of tree dimensions, respective tree height, crown area, diameter at breast height (dbh), and total leaf area vis-a-vis age were studied for 790 heritage trees ≥ 100 years old in Macau; 50 genera and 63 species were represented. Seven out of ten common genera showed no significant increase for all tested parameters except increase of dbh with age. Other factors, such as condition and geometry of growing spaces, controlled the performance of heritage trees, as well as the realization of their biological potential size, with implications on the provision of ecosystem services. The effects of these heritage trees on air-quality improvement and gross carbon sequestration were quantified by the i-Tree Eco model. Overall, 806.8 kg of air pollutants were removed annually, with benefits valued at US $8,091. The heritage trees stored 3,041 t carbon in total and sequestered 842 kg carbon/yr, equivalent to US $601 in annual benefits. The values were much higher than ordinary urban forest trees. Ten common heritage tree genera were ranked by their capacities for air quality improvement, carbon storage, and sequestration. The findings can serve as a decision tool for heritage tree management and conservation and to estimate potential ecosystem services of established trees.

Keywords. Air-Pollutant Removal; Carbon Sequestration; Carbon Storage; Ecosystem Service; Heritage Tree; Monetary Value.

Abstract. Climate change will have profound deleterious effects on many trees in urban environments; however, as in any biological system undergoing change, there will be benefits. On 7 February 2009, the Australian city of Melbourne experienced its hottest day on record (46.4 °C [115.5 °F]) after a heat wave. In the days that followed, the foliage of native Australian mistletoes, *Amyema miquelii* and *A. pendula*, growing on *Eucalyptus camaldulensis* were observed to lose their green color and turn gray. In large numbers, the mistletoes can cause significant stress, leading to tree death. In the aftermath of the record hot day, large numbers of mistletoes died, and 5 years later the level of mistletoe infestation remained low. On the afternoon of 7 February 2009, tens of thousands of elm leaf beetles, which heavily graze the mature elms of Melbourne (*Ulmus procera* and *U.* × *hollandica*), were found dead under the canopies of street trees, and numbers remained low for at least 5 years thereafter. Similarly, psyllids, *Mycopsylla fici*, and infestations of *Ficus macrophylla*, which can seriously defoliate trees, fell from high to undetectable levels in the month following the heat wave. The effects of heat waves and very high temperature days have significant implications for those managing pests in urban forests. Pest control programs were unnecessary in the immediate aftermath of the heat wave and hot days and for up to 5 subsequent years. This has positive implications for tight tree management budgets, but could also lead to a discontinuation of pest monitoring and control programs. Such an approach could see a return to high levels of infestation.

Keywords. *Amyema miquelii*; Elm Leaf Beetle; *Eucalyptus camaldulensis*; *Ficus macrophylla*; High Temperatures; Mistletoe; *Mycopsylla fici*; *Ulmus.*

Abstract. Trees provide an array of social, economic, and ecological benefits; furthermore, trees on public land are critical for providing those benefits to people who cannot afford their own trees. It is important to know how managers make trade-offs and prioritize different tree selection criteria in order to target educational campaigns at the state or regional level. Primary contacts for Tree City USA designated cities were surveyed across the Pacific Northwest. Of these municipalities, 79 out of 151 responded (52.3% response rate), with 6 municipalities providing

responses from different departments for a total of 85 responses. Currently, there are primarily descriptive statistics in relation to tree species selection. This study provides a framework for future statistical analysis and greater exploration of how municipalities and managers are selecting tree species. Results were analyzed with a Mann-Whitney U test to compare International Society of Arboriculture (ISA) Certified Arborists® to those who are not certified across various tree species selection criteria. Another Mann-Whitney U test was used to compare small (≤ 50,000) and large (> 50,000) municipalities across the same criteria. ISA Certified Arborists® showed statistically significant differences from those who are not certified in a number of tree species selection criteria. ISA Certified Arborists® also differed in urban forest management on a city-wide scale, particularly in favoring greater tree species diversity. The differences in urban forest management between ISA Certified Arborists® and noncertified—and between municipality sizes—can help to influence future educational campaigns targeted toward increasing urban forest health and resiliency.

Keywords. ISA Certified Arborists®; Pacific Northwest; Right Tree Right Place; Tree City USA.