



Categorising the Tree Protection Legislative Provisions Implemented by Local Planning Authorities Globally

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Abstract: This study aims to categorise the tree protection legislative provisions (TPLPs) being implemented by local planning authorities (LPAs) worldwide to protect their urban trees. Through inductive thematic analysis of content in numerous LPA websites and the legislation documents downloaded from the websites, this study identified five categories of TPLPs: 1) Tree Felling Prohibition, 2) Significant Tree Register Establishment, 3) Tree Conservation Area Designation, 4) Tree Preservation Order (TPO), and 5) Tree Protection Planning Conditions. The first TPLPs category is for LPAs to prohibit tree felling or other tree damaging activities without their consent. The second category is to allow LPAs establishing registers of trees that are considered significant for protection. The third gives power to LPAs to designate their conservation areas and protect the trees inside the areas. Next, the TPO is the orders made by LPAs to protect specific trees, groups of trees or woodlands in the interests of amenity. The final TPLPs category is about conditions imposed by LPAs on a grant of planning permission that requires the developers to retain and protect any tree. The comprehensive information gathered has also enabled and protected urban trees to be broadly categorised into two: 1) Regulated Trees, and 2) Registered Trees. Moreover, several concepts of urban tree protection were developed and described to elucidate the categorisation. The concepts are: "Prohibitive vs Directive" commands pertaining to approaches taken by LPAs to protect trees; "Specific vs Blanket" methods to declare the protected trees; and "To be Protected vs To be Preserved" status to explain implications of being in each of the protected urban tree categories.

Keywords: Tree protection legislative provisions, local planning authorities, categorization, urban tree protection concepts

1. Introduction

Given the global concern about climate change and biodiversity loss, countries have supported policies that promote conservation and sustainable forest management to ensure that forests and trees are protected. The international treaties, agreements, laws and regulations such as the *International Tropical Timber Agreement (ITTA)*, the *U.S. Lacey Act* with the adoption of the *Legal Timber Protection Act (LTPA)* and the *EU's Forest Law Enforcement, Governance and Trade (FLEGT)* (Sotirov et al, 2020) directly protect trees in the forests from being felled or removed unsustainably. In addition to the timber trade-related agreements above, trees are also protected through the *Convention on International Trade in*

Endangered Species of Wild Fauna and Flora (CITES) and the United Nations Framework Convention on Climate Change (UNFCCC).

At the national level, forest trees in each country are usually protected (i.e., government permits are required to fell or remove trees) mainly through forestry-related legislation such as the *Forestry Law* (People's Republic of China), *Federal Forest Act* (Germany), *National Forest Act* (South Africa), *Federal Act on Forest* (Switzerland), and *Forestry Act* (UK). The definition of forest, which exactly determines the area it covers, differs between and even within a country. In addition, the definition is subject to constant legislation reviews and amendments. Due to this inconsistency, most forest legislations do not completely cover the protection of urban trees (Knuth, 2005).

In a city, town or suburb, trees that have been planted or grown naturally and other floras and faunas make up a forest commonly known as an urban forest. Urban trees (also referred to as 'municipal trees') benefit humans and the settlements in several aspects, such as health improvement (Ulmer et al, 2016), air pollutants reduction (Baldauf, 2017), CO₂ sequestration (Fares et al, 2017), stormwater run-off reduction (Berland et al, 2017) and noise abatement (Joshi et al, 2013). While striving to sustain urban forests as much as possible, there are consistent requests to remove some of the trees to foster development. The local planning authority (LPA) shall evaluate the tree removal application thoroughly, and carefully consider every opportunity to preserve the trees before approving the removal.

LPAs can have a legal approach in the form of legislative provisions to regulate and protect urban trees through the power provided by various higher-tier (central, federal or provincial) legislations or parent acts of their countries which include, but are not limited to: *Municipal Act 2001* and *Planning Act 1990* in Canada (Yung, 2018), *Planning and Development Act 2005*, *ACT Tree Protection Act 2005* and *Local Government Act 1989* in Australia (Lensink, 2012), and *Town and Country Planning Act 1990* in the UK (Mohd Hashim & Hitchmough, 2015). This article is designed to categorise the tree protection legislative provisions (TPLPs) being implemented by local planning authorities (LPAs) in countries worldwide to protect their urban trees. Through the categorisation, TPLPs would be easier to recognise and differentiate, hence elucidating their significance and implications. A better understanding of TPLPs is expected to make the implementation more effective.

2. Materials and Methods

This study employed the inductive thematic analysis of content in authoritative websites and downloadable (authoritative documents). Content analysis is a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use (Krippendorff, 2013). Thematic analysis, as the name implies, is the content analysis that is performed with a focus to identify common themes of meaning that come up repeatedly. It is a method for describing data, but it also involves interpretation in the processes of selecting codes and constructing themes (Kiger & Varpio, 2020). Inductive analysis is a process of coding the data without trying to fit it into a pre-existing coding frame or the researcher's analytic preconceptions. In this sense, this form of thematic analysis is data-driven (Braun & Clarke, 2006) and it involves allowing the data to determine the themes. This method requires the researcher to read a large number of data sources (such as websites and documents) until a theme (or themes) is perceived.

This study was started by conducting a Google search using several keywords such as "urban tree protection", which resulted in various information on the subject matters, including some newly learned terminologies. Next, websites of local planning authorities and other relevant agencies around the world were browsed and searched for tree protection-related information and terminologies. Some of the websites also have pertinent documents to this study that are downloadable to be further examined. The webpages (pages of websites) from which information about TPLPs was retrieved are shown in Table 1. Furthermore, the downloaded authoritative documents were examined as tabulated in Table 2.

Table 1 - The Webpages from Which Information Are Retrieved in This Study

ID	Website Owner	Webpage Title	Link
W01	Arboricultural Association (UK)	<i>A Brief Guide to Legislation for Trees</i>	trees.org.uk/Help-Advice/Public/A-brief-guide-to-legislation-for-trees
W02	Bayside City Council (Victoria)	<i>Nominate a tree for our significant tree register</i>	bayside.vic.gov.au/services/trees-parks-and-beaches/nominate-tree-our-significant-tree-register
W03	City of Bayswater (Western Australia)	<i>Significant Tree Register</i>	bayswater.wa.gov.au/environment-and-sustainability/parks-and-gardens/trees/significant-trees-register
W04	City of Fremantle (Western Australia)	<i>Register of Significant Trees and Vegetation Areas</i>	fremantle.wa.gov.au/sites/default/files/LPP 2.23 - Significant Trees and Vegetation Areas - Oct 2020.pdf
W05	City of Hobart (Tasmania)	<i>Significant Tree Register Nominations 2021</i>	hobartcity.com.au/files/assets/public/development/planning/significant-trees/significant-tree-register-information-sheet-2021.pdf
W06	Dept for Infrastructure and Transport (South Australia)	<i>Adelaide Hills Council Development Plan</i>	dit.sa.gov.au/__data/assets/pdf_file/0007/249955/Adelaide_Hills_Council_Development_Plan.pdf
W07	Dunedin City Council (New Zealand)	<i>Tree Maintenance</i>	dunedin.govt.nz/services/trees
W08	Ealing Council (UK)	<i>Trees and planning applications</i>	ealing.gov.uk/info/201232/privately-owned-trees/2009/trees_and_planning_applications

W09	East Devon District Council (UK)	<i>Trees subject to planning conditions</i>	eastdevon.gov.uk/trees/tree-preservation-orders-and-trees-protected-in-conservation-areas/trees-subject-to-planning-conditions/
W10	Glen Eira City Council (Victoria)	<i>Nominate now for the Classified Tree Register</i>	gleneira.vic.gov.au/about-council/news/latest-news/nominate-now-for-the-classified-tree-register
W11	Legislative Assembly for the Australian Capital Territory	<i>An Appropriate Tree Management and Protection Policy For The Act</i>	parliament.act.gov.au/_data/assets/pdf_file/0006/377295/p44tre.epolicy.pdf
W12	Maribyrnong City Council (Victoria)	<i>Significant Tree Register</i>	maribyrnong.vic.gov.au/Building-planning/Current-and-future-planning/Significant-Tree-Register
W13	Ministry of Housing, Communities & Local Government (UK)	<i>Tree Preservation Orders and Trees in conservation areas</i>	gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas
W14	Ministry of Housing, Communities & Local Government (UK)	<i>Tree Preservation Orders and Trees in conservation areas</i>	gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas#amenity-means
W15	National Trust (Australia)	<i>Significant Tree Register</i>	nationaltrust.org.au/services/significant-tree-register/
W16	National Trust (Australia)	<i>Sponsorship ACT</i>	nationaltrust.org.au/sponsorship-act/
W17	Randwick City Council (New South Wales)	<i>Significant Tree Register</i>	randwick.nsw.gov.au/environment-and-sustainability/trees/significant-tree-register
W18	Southampton City Council (UK)	<i>TPO map</i>	southampton.gov.uk/people-places/parks-open-spaces/trees/protected/tpo-map/
W19	Whitehorse City Council (Victoria)	<i>Tree Assistance Fund</i>	whitehorse.vic.gov.au/waste-environment/trees-and-gardens/trees/tree-assistance-fund

Table 2 - List of Downloaded Documents

ID	Website Owner	Document Title	Link
D01	City of Burnaby (Canada)	<i>Burnaby Tree Bylaw 1996, No. 10482</i>	bylaws.burnaby.ca/media/Consolidated/10482C.pdf
D02	City of Calgary (Canada)	<i>Tree Protection Bylaw, No. 23M2002</i>	calgary.ca/CA/city-clerks/Documents/Legislative-services/Bylaws/23M2002-TreeProtection.pdf
D03	City of Colwood (Canada)	<i>Urban Forest Bylaw, No. 1735, 2018</i>	colwood.civicweb.net/document/132905
D04	City of Greensboro (USA)	<i>Land Development Ordinance</i>	online.encodeplus.com/regs/greensboro-nc/doc-viewer.aspx?secid=251#secid=66
D05	City of Kingston (Canada)	<i>Tree Bylaw No 2018-15</i>	cityofkingston.ca/documents/10180/16904/Tree+Bylaw
D06	City of Ottawa (Canada)	<i>Tree Protection Bylaw, No. 2020-340</i>	ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/tree-protection-law-no-2020-340
D07	City of Richmond (Canada)	<i>Tree Protection Bylaw, No. 8057</i>	richmond.ca/_shared/assets/BL_8057_-_04262158445.pdf
D08	Food and Agriculture Org (FAO)(UN)	<i>Environmental Planning and Assessment Model Provisions 1980.</i>	faolex.fao.org/docs/pdf/nsw12887.pdf
D09	FAO (UN)	<i>Nigerian Urban and Regional Planning Act 1992</i>	faolex.fao.org/docs/pdf/nig120669.pdf
D10	Govt of Bermuda	<i>Development and Planning (Tree Preservation Order) Regulations 1975</i>	bermuda.laws.bm/laws/Consolidated Laws/Development and Planning (Tree Preservation Order) Regulations 1975.pdf
D11	Govt of Gibraltar	<i>Environmental Protection (Trees) Act 2014</i>	gibraltarlaws.gov.gi/legislations/environmental-protection-trees-act-2014-3518/version/15-08-2019/download
D12	Govt of Singapore	<i>Parks and Trees Acts 2006</i>	nparks.gov.sg/~media/nparks-real-content/gardens-parks-and-nature/tree-conservation-areas/relevant-sections-of-the-parks-and-trees-act.pdf?la=en
D13	Jamestown, North Carolina (USA)	<i>Jamestown Land Development Ordinance</i>	jamestown-nc.gov/resources/OrdinanceUpdated_1_2017.pdf
D14	National Environment and Planning Agency (Jamaica).	<i>Town and Country Planning (Tree Preservation) Regulations, 1967</i>	nepa.gov.jm/sites/default/files/2021-12/Town-And-Country-Planning-Tree-Preservation-Reg1967.pdf
D15	National Trust (Australia)	<i>Significant Tree Protection</i>	nationaltrust.org.au/wp-content/uploads/2016/06/Tree-Protection-in-Australia_National-Trusts-of-Australia.pdf
D16	New South Wales (NSW) Government	<i>NSW Electricity Supply Act 1995</i>	legacy.legislation.nsw.gov.au/~pdf/view/act/1995/94/whole
D17	NSW Government	<i>Sydney Water Act 1994</i>	legacy.legislation.nsw.gov.au/~pdf/view/act/1994/88/whole
D18	NSW Government	<i>Great Lakes Local Environmental Plan 1996</i>	legacy.legislation.nsw.gov.au/~pdf/view/epi/1996/615/effective2011-02-18/whole
D19	NSW Government	<i>Kiama Local Environmental Plan 1996</i>	legacy.legislation.nsw.gov.au/~pdf/view/epi/1996/334/whole
D20	The National Archives (UK)	<i>Planning (Listed Buildings and Conservation Areas) Act 1990</i>	legislation.gov.uk/ukpga/1990/9/part/II/data.pdf
D21	The National Archives (UK)	<i>Town and Country Planning Act 1990</i>	legislation.gov.uk/ukpga/1990/8/part/VIII/enacted/data.pdf

D22	The National Archives (UK)	<i>Town and Country Planning (Tree Preservation) (England) Regulations 2012</i>	legislation.gov.uk/ukxi/2012/605/made/data.pdf
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3. Results and Discussion

3.1 Tree Protection Legislative Provisions

The TPLPs being implemented by LPAs around the world to protect their urban trees can be categorised as shown in Figure 1: 1) ‘Tree Felling Prohibition’, 2) ‘Significant Tree Register’ establishment, 3) ‘Conservation Area’ designation, 4) ‘Tree Preservation Order (TPO)’ and 5) ‘Tree Protection Planning Conditions’. The description of each TPLP is summarised in Table 2.

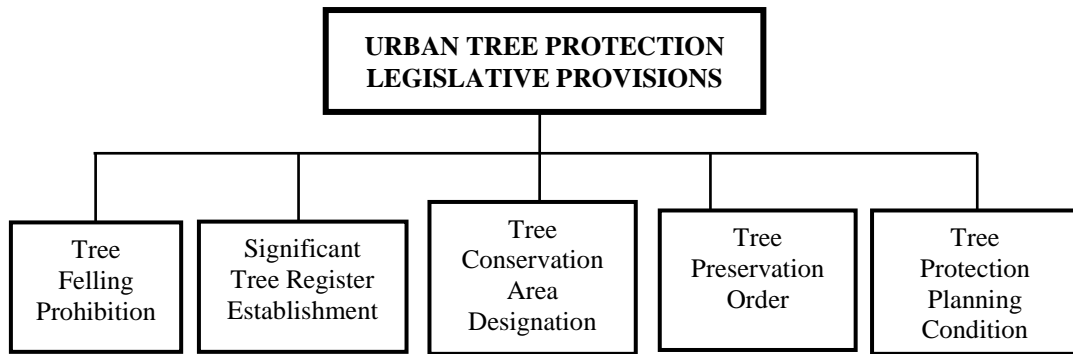


Fig. 1 - Categories of Urban Tree Protection Legislative Provisions

Table 3 - Summary of TPLP Categories

No	Category of TPLP	Remarks	Country*
1	Tree Felling Prohibition	In the form of by-laws and regulations. Based on tree diameter, and also the species.	Australia, Canada, USA
2	Significant Tree Register Establishment	Practised in Australia only. Trees are considered significant for various reasons.	Australia
3	Tree Conservation Area (TCA) Designation	A designated area wherein trees of a certain diameter or girth are protected.	Singapore, UK, USA
4	Tree Preservation Order (TPO)	Practised mostly in Commonwealth countries and British overseas territories. LPAs have the power to make orders to preserve trees.	Australia, Bermuda, Gibraltar, Jamaica, Nigeria, UK
5	Tree Protection Planning Condition	Conditions that require trees to be protected when planning permissions are granted.	UK

* from which the LPA websites were browsed for the information.

3.1.1 Tree Felling Prohibition

Empowered by the various parent acts, LPAs (or municipalities) can enact by-laws (e.g., in Canada) or adopt rules and regulations (e.g., Australia) to protect their trees by prohibiting felling or other tree-damaging activities. In Canada, by-laws have been considered the highest form of protection accorded to urban trees (Webber et al, 2020). The Canadian province of Ontario has not less than 10 tree-related by-laws enacted by its municipalities, which include Parks By-Law, Highway Tree By-Law, Public Tree By-Law, Forest/Woodland Conservation By-Law and Heritage Tree By-Law.

Some municipalities have a more general tree protection by-law that covers all types of trees within their areas. Referred to as ‘Tree Bylaw’ [e.g., *Burnaby Tree Bylaw 1996, No 10482* (D01 of Table 2); *Tree Bylaw No 2018-15* (D05)], ‘Tree Protection Bylaw’ [e.g., *Tree Protection Bylaw, No. 23M2002* (D02); *Tree Protection Bylaw, No. 2020-340* (D06); *Tree Protection Bylaw, No. 8057* (D07)] or ‘Urban Forest Bylaw’ [e.g., *Urban Forest Bylaw, No. 1735, 2018* (D03)], it prevents any activity that would damage, and cutting down protected trees without permit. Nevertheless, the bylaws mentioned above have provisions that exempt the permit requirement if the trees are allowed to be felled under other legislations such as the *Electricity Act, 1998* mentioned in Section 5(e) of D05, and *Surveyors Act, R.S.O. 1990* in Section 81(3) of D06.

Generally, from the content of the above bylaws, a municipality would regard all trees on land owned by it or in the position of it as protected trees. For trees in areas proposed for development and trees of certain species, each municipality has its criteria to determine which trees are to be protected. Mostly, the circumference or the diameter of the stem measured at a certain distance above the ground, is one of the main criteria (see Figure 2). For example, the City of Burnaby defines 'protected tree', in the sub-section 2(o) of its *Tree Bylaw* (D01), as a tree having a diameter (measured at 1.3m above the ground) of 20.3 cm or greater (if the tree is in the area of which a development application has been made), 30.5 cm or greater (conifer tree) and 45.7 cm and greater (broad leaf tree).

In the City of Colwood, as mentioned in subsection 1(1) of D03, all trees with a diameter of 60 cm (measured at 1.4 m above the ground) and above are protected. On top of that, it also specifies other diameter values for specific tree species such as 4.0 cm or greater for Pacific Yew (*Taxus brevifolia*) and 30 cm or greater for Big Leaf Maple (*Acer macrophyllum*). For the City of Kingston [sub-section 1(a) of D05] and the City of Richmond [sub-section 2.1(a) of D07], all trees located inside its area are protected as long as their diameter is or greater than 15 cm (at 1.37 m) and 20 cm (at 1.4 m), respectively.

In some parts of Australia, through provisions by the parent acts and adoption of regulations, LPAs can declare trees in their areas as protected. Depending on which state or territory of Australia, the protected trees are called in the acts by many names: 'regulated tree', 'significant tree', and 'registered tree'. In South Australia, a 'regulated tree' simply means that any activity on the tree (such as removal) is regulated by LPAs. The tree protection-related bylaws and regulations, and the procedures are informed to the public in the form of gazettes and the state or local planning policy and made available on the LPAs websites [e.g., Adelaide Hills Council (W06 in Table 1), City of Fremantle (W04)].

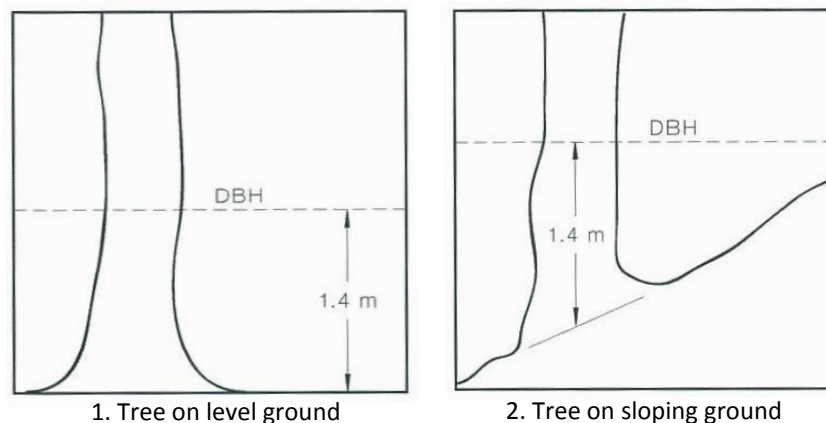


Fig. 2 - Examples of Tree Diameter Measurement Method

Source: Australian Standard AS 4970:2009

3.1.2 Significant Tree Register Establishment

Besides the girth or diameter sizes, trees in Australia can also be considered significant for several reasons, including scientific (horticultural), social, historic or aesthetic significance. The tree only needs to meet the benchmark for one of many criteria to be considered significant [National Trust of Australia (D15)]. For instance, a tree is significant if it is:

- 1) an important source of seed or propagating stock (horticultural),
- 2) an important landmark (social),
- 3) associated with an important event (historic), or
- 4) is great looking (aesthetic).

These significant trees are normally listed in registers (hence also referred to as 'registered trees' in Australia Capital Territory) established and managed by LPAs. The establishment of a Significant Tree Register is to ensure that trees listed on the Register are given legislative protection and require approval for alteration or removal [Legislative Assembly for the Australian Capital Territory (W11)]. Information pertaining to the significant tree register, its management and the updates are accessible to the public via webpages of the LPAs [e.g., Randwick City Council (W17); Maribyrnong City Council (W12); City of Bayswater (W03)].

Significant tree registers are also managed by non-governmental organisations such as the National Trust of Australia (W15), which has compiled more than 2,500 significant tree records across Australia in the past 30 years and loaded them into the National Register. Any individual or group can nominate a new 'significant tree' by completing the nomination form normally made available online by LPAs or the Natural Trust. New trees are then assessed against the criteria set by LPA working groups or which have been agreed upon nationally by the Significant Trees Committees for each state or territory. The nomination procedures, including the assessment criteria and the forms, can be found in some LPA

webpages [e.g., City of Hobart (W05); Glen Eira City Council (W10); Bayside City Council (W02)]. Once approved, the significant tree information is available to the public through Significant Tree Register (hardcopy in the LPA offices or softcopy on the websites), GIS-based map apps, property search info and erected signage at the sites.

3.1.3 Conservation Area Designation

In some countries, LPAs have the power to designate a conservation area and to protect the trees inside the areas. For example, in the UK, the power to designate the conservation areas is mentioned in Part II sub-sections 69 (1)(a) and (b) of the *Planning (Listed Buildings and Conservation Areas) Act 1990* (D20). Next, through Part VIII Section 211 of the *Town and Country Planning Act 1990* (D21), the LPAs can protect trees (e.g., with a diameter of 7.5 cm or greater measured at 1.5 m above the ground) in the designated conservation area.

Singapore, being a city-state, whereby the entire country constitutes a single municipality, was rated as the greenest city in the world for having 29.3% of its area covered by tree canopies (Wong et al, 2018). Through Part IV of the *Parks and Trees Act (Chapter 216) 2006* (D12), any geographical area in Singapore (outside a national park or nature reserve) can be designated as a tree conservation area (TCA) by an order published in a gazette. The gazette shall contain a map of the TCAs. Any tree in the TCAs having a girth exceeding 1 meter (measured at 50 cm above the ground) is protected from being cut or damaged without approval.

In North Carolina, USA, municipalities (town and city councils) also designate TCAs through ordinances (similar to by-laws) such as the *Jamestown Land Development Ordinance* (sub-article 11.18-2) (D13) and *City of Greensboro Land Development Ordinance* (sub-article 30-5-5.5) (D04) to protect the trees with diameter of 4 inches (about 10 cm) or bigger measured at 4.5 feet (about 1.37 m) above the ground from tree disturbing activities.

3.1.4 Tree Preservation Order

Tree Preservation Order (TPO), originally introduced in the UK in 1947 (Nicholson, 2016), is another tree protection legal approach practised by LPAs in many Commonwealth countries such as England, Australia, Bermuda, Gibraltar, Jamaica, Malaysia, Malta, Nigeria, Scotland and Solomon Island. TPO, as defined by the Government of the UK [Ministry of Housing, Communities & Local Government (W13)], is an order made by a local planning authority in England to protect specific trees, groups of trees or woodlands in the interests of amenity (W14). The order prohibits the cutting down, topping, lopping, uprooting, wilful damage or wilful destruction of trees without the local planning authority's written consent. Many LPAs in the UK, such as Southampton City Council (W18), display the map of the TPO trees on their websites for public view.

As with the other tree protection legal means discussed above, TPO-making power is conferred to LPAs through different parent acts and is described in regulations (or rules), depending on the country or the state. With regards to TPO of England, the power to make it is provided to LPAs through Part VIII Section 198 of the *Town and Country Planning Act 1990* with the procedures as stipulated in the *Town and Country Planning (Tree Preservation) (England) Regulations 2012* (D22). For Bermuda, Gibraltar, Jamaica and Nigeria, the acts and/or regulations are the *Development and Planning (Tree Preservation Order) Regulations 1975* (D10), the *Environmental Protection (Trees) Act 2014* (D11), the *Town and Country Planning (Tree Preservation) Regulations, 1967* (D14), and the *Urban and Regional Planning Act 1992* (D09), respectively. For the New South Wales (NSW) state of Australia, TPO is detailed in clause 8 of the *Environmental Planning and Assessment Model Provisions 1980* (D08).

A TPO can also be nullified by other acts. For instance, a TPO tree made in the NSW can be felled if required by other acts, such as the *NSW Electricity Supply Act 1995* [sub-sections 48(7) and 48(8)] (D16) and the *Sydney Water Act 1994* [sub-sections 46(7) and 46(8)] (D17), and also in local environmental plan legislation, e.g., Part 3 Section 10 of the *Great Lakes Local Environmental Plan 1996* (D18) and Part 10 sub-section 53(6) of the *Kiama Local Environmental Plan 1996* (D19).

3.1.5 Tree Protection Planning Conditions

Planning condition is a term in urban planning that refers to a condition imposed on a grant of planning permission. In the context of urban tree protection, planning condition requires the developers to retain and protect any tree as the LPA wishes, trees that are protected in the bylaws, rules or regulations, significant tree registers and TPOs, and trees in TCAs. If tree protection planning conditions are in place, then anyone wishing to undertake work on trees shown as part of the planning condition must ensure they liaise with the LPA and obtain any necessary consent or variation (Arboricultural Association). Unlike the previous four TPLPs that focus on declaring trees to be preserved and protected, this 'planning conditions' TPLP ensures that the declared trees are protected during construction projects [e.g., Ealing Council (W08), East Devon District Council (W09)]. Section 197 of the UK *Town and Country Planning Act 1990* (D21) places an express duty on the local planning authority, when granting planning permission, to ensure that adequate conditions are imposed to secure the preservation or planting of trees whenever appropriate. It also ensures that any necessary tree preservation orders are made under section 198 of the 1990 Act.

3.2 Protected Urban Tree Categories and the Concepts

The comprehensive information gathered has enabled a broad categorisation of the protected trees into ‘regulated’, and ‘registered’ as shown in Figure 3. Regulated trees are trees protected in a blanket manner by bylaws, rules and regulations, and trees in conservation areas. Registered trees are those specifically declared either as significant trees or TPO trees. The characteristics and differences between the two protected tree categories are elaborated through the following concepts of urban tree protection, i.e., the “Prohibitive vs Directive”, “Specific vs Blanket”, and “To Be Protected vs To Be Preserved”. These newly founded concepts would provide a wider perspective on urban tree protection and instil better comprehension.

3.2.1 “Prohibitive vs Directive” Approach

Before elaborating on the ‘prohibitive vs directive’ approach, let us recap on the broad categorisation of protected trees into ‘Regulated Trees’ and ‘Registered Trees’ (Figure 3) and projected objectives of LPA for each of the tree protection categories. The main concern of LPAs in the former is to prohibit any work on trees without their approval. In other words, the LPAs may respond to applicants as follows: “Please let us see the regulated trees first before deciding whether or not you can do any work on them”. In the latter, the LPAs’ concern is to give official instruction (directive) that the trees must be preserved, and hence will ultimately be protected. On that note, the LPAs might inform the developers (after the trees are registered as protected): “Please try your very best to retain and protect these registered trees in your development planning at the earliest stage possible, or otherwise you will not be granted the planning permission”. Hence, the protection of regulated trees is achieved by a prohibitive approach while for the registered trees, it is by a directive approach. Both approaches require different legislation provisions. LPAs are unable to establish significant tree registers or make TPOs using the provisions that are meant for regulated trees.

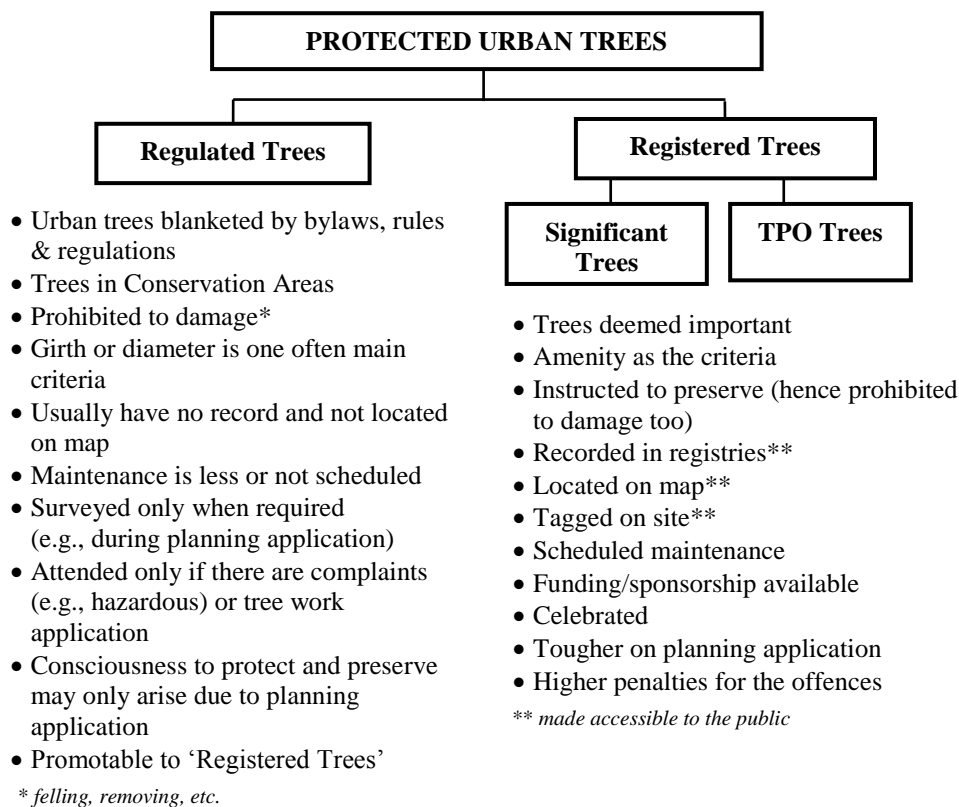


Fig. 3 - Categories of Protected Urban Trees

3.2.2 “Specific vs Blanket” Declaration of Protected Trees

Trees are declared as protected, either individually (specific), or as a group (blanket) in a designated area. The designated area could be as big as the whole municipality, sizeable as a woodland or a conservation area within the municipality, or small as a strip of land next to a road. ‘Specific declaration’ refers to the individually protected trees mentioned in Significant Tree registries or TPO tree lists. Detailed information about each tree must be recorded in a registry or list, notified and made available to the public. For an individual TPO tree, normally the tree reference number,

its location (or address), description and species name are included in the list and drawn on the map as a black circle with, e.g., a 'T1' mark as in the UK TPO system.

'Blanket declaration' can be best understood through the 'Regulated Trees' situation, whereby LPAs declare to the public that all trees or some types of trees (based on the girth or diameter, or species) in their areas are protected without having to give detailed information of each tree. The LPAs might not even know how many trees are there in their areas. Nevertheless, whenever a regulated tree is mentioned to them (through public complaints or tree work applications), only then they may be able to have the information and create a record of the tree. Furthermore, a tree survey is carried out only if required by a planning application. When it happens, that could be the only chance for LPAs to realise the preservation of the trees.

Trees in conservation areas are also blanketly declared as protected, regardless of the size and species. However, unlike the other regulated trees, the trees in conservation areas can be located on a map, at least as a group (with no information on the total number) inside the boundary designating the areas. Similarly, this explanation applies to trees in area TPOs and woodland TPOs. For trees in a group TPO, despite being called a 'group', the declaration is rather specific. On the map, the group can be seen located inside a dotted black line, and the number of trees and species names are recorded (e.g., 9 Oak and 5 Ash as in the UK TPO system).

3.2.3 "To Be Protected vs To Be Preserved"

This 'to be protected vs to be preserved' concept might seem similar to the one discussed in 'prohibitive vs directive'. Nevertheless, while the previous concept focuses on the approach, this concept will convey a message of its meaning or implications, for a tree, after it is declared as a 'regulated tree' or as a 'registered tree'. A regulated tree may enjoy the fact that it cannot easily be damaged by humans because LPAs prohibit such actions without their approval. Besides that protection, there may not be further efforts by LPAs for the tree's well-being, no scheduled maintenance and no health check. The tree might not even be noticed by LPAs, except if it is perceived and reported as hazardous by the public, and consequently will be attended to by LPA tree officers. Nonetheless, even though the tree has gained the LPA's attention, its final fate could be fatal (i.e., when LPA decides to fall or remove it).

On the other hand, a registered tree is meant to be preserved, and hence will be protected from all elements that could hurt it, make it sick and shorten its life. Many LPAs have a maintenance plan (schedules and funding) for their registered trees and instruct the owners of other registered trees to ensure the well-being of the trees. Some LPAs such as Dunedin City Council (W07) and Whitehorse City Council (W19) provide a financial incentive, such as Tree Assistance Fund to assist owners with the maintenance of significant trees. Registered trees, especially the significant ones, are celebrated too. Their stories are told to the public and they receive donations and sponsorship from environmentally concerned and civic-minded members of the society [e.g. the National Trust of Australia (W16)]. Registered trees make it tougher on planning application if the applicant intends to remove the trees. Even if the applicant does not have the intention, protecting a registered tree during construction can be a more risky task given the penalties for damaging a registered tree are higher than a regulated one, particularly in terms of the number of replacement trees and monetary fines.

4. Conclusion

This study has categorised the tree protection legislative provisions (TPLPs) being implemented by local planning authorities (LPAs) in countries globally to protect their urban trees. The TPLP categories are 1) Tree Felling Prohibition, 2) Significant Tree Register Establishment, 3) Tree Conservation Area Designation, 4) Tree Preservation Order, and 5) Tree Protection Planning Conditions. The categorisation was developed through inductive thematic analysis of the content retrieved from many LPA websites around the world and in the authoritative documents downloaded from the websites. Moreover, the study has also categorized the protected urban trees broadly as 'regulated' and 'registered'. The meanings of each protected urban tree category are elaborated by the urban tree protection concepts found in this study which include "*Prohibitive vs Directive*", "*Specific vs Blanket*", and "*To Be Protected vs To Be Preserved*".

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