

Stirling Council
Tree Risk Management Review
and
STORMS 2014

DRAFT

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1.0 Executive Summary

The current approach to tree risk management for Stirling Council was reviewed and found to be reactive rather than proactive with no formal tree risk management strategy in place. This leaves the Council unacceptably exposed to claims arising from dangerous trees under its ownership. To date tree inspections and tree maintenance work has been carried out on an ad hoc basis mainly by external tree consultants and contractors with no clear written specifications as to tree assessment methodology or tree works required. Existing data for Stirling's tree population is incomplete and outdated with the last in house inventory carried out in 2007. Communication across the Council services responsible for trees could be greatly improved. Implementation of industry standard best working practices would prevent unnecessary loss of the Council's tree asset and/or avoid trees becoming unsafe as a result of poor working practices from both council and external contractors. Training needs are identified and existing basic tree inspection skills are currently underutilised within Land Services. A tree risk management strategy (STORMS 2014) is developed for discussion and implementation based on industry standard best practices culminating in a standalone operational working document. Successful implementation of the strategy will only be achieved through purchase of a "fit for purpose" asset management system and must be supported by dedicated and realistic resources.

SECTION I - Review

2.0 Introduction

2.1 This report is divided into THREE SECTIONS; the first reviews Stirling Council's current approach to tree risk management which includes looking at Land Services and other Council services who have responsibility for trees. The same section also highlights the requirement for the Council to have a formal tree risk management strategy document and the necessity for dedicated resources. The second section identifies the process for the development of the strategy document and lastly, the third section comprises the proposed **Stirling Tree Operational Management Strategy (STORMS 2014)** which is a standalone document to be implemented within available Stirling Council resources. The strategy complies with recognised industry best practice and will reduce the council's exposure to liability from hazardous trees.

2.2 It is difficult to exclude other aspects of overall tree management and care within Stirling Council whilst carrying out this review and some important points have been raised in this report. It is envisaged that the management approach for the implementation of the risk strategy document will provide a way forward when looking at the management of routine and planned operations for both street trees and woodlands under Council ownership.

2.3 The tree risk strategy should form an integral part of a specific strategic Stirling Council Urban Forest Management Plan (Wassenaar van, et al., 2011) to include short, medium and long

term plans for both street trees and urban woodlands which collectively form part of the “urban forest” (Konijnendijk et al, 2005). This wider remit is outwith the scope of this report.

2.4 The council has both a statutory and common law duty of care to ensure residents and visitors are not subjected to a foreseeable risk of harm from dangerous trees under Council ownership.

3.0 Background

3.1 Stirling Council has a population of around 91,000 citizens and enjoys an average of 3.9 million visitors annually (SCAP, 2011). Its area of landownership falls within part of the popular tourist destination of the Loch Lomond and Trossachs National Park (LLTNP). The development and implementation of a tree risk management strategy will aim to ensure Stirling Council’s residents and visitors are allowed to safely enjoy the health and well being, amenity, biodiversity and eco system services provided by Stirling’s trees and woodlands whilst meeting the council’s duty of care.

3.2 The recent Open Space Strategy (OSS, 2012) for the Stirling area was carried out in response to requirements set out in the Scottish Planning Policy (SPP) 2010 and Planning Advice Note (PAN) 65. The Stirling Council area is geographically stratified into rural and neighbourhood “settlements” and the report concluded that “no one is more than 300m from a publicly accessible open space” of which 50% is made up of woodland or semi natural greenspace **i.e. a space which contains trees.**

3.3 One of the main policy OSS objectives (Tree and Woodland Policy Objective no. 5) includes a requirement to “develop a plan of regular inspections” of trees i.e. a strategic approach to the management of risk from trees.

4.0 Current Approach to Tree Risk Management

4.1 The overall approach by Stirling Council to tree risk management is mainly on an *ad hoc* basis with work issued to contractors largely in response to complaints received by members of the public via the contact centre. These are recorded on the Council’s internal system LAGAN.

4.2 Since 2010 tree surveys have been carried out by various arboricultural consultants who have made recommendations for tree works required to abate nuisance or potentially hazardous trees. It is unclear whether much of this work has been completed to date as there is no method of recording this currently in place. The surveys have been focused on **perceived** areas of high risk

only with no strategic approach in place for the prioritisation of surveys, for example, through “risk zoning”.

4.3 Some but not all of the survey data was recorded electronically using the council’s “in house” and now outdated asset management system. Tree records are incomplete and data has not been utilised in an effective way.

4.4 A dedicated and “fit for purpose” computerised tree asset management system is necessary for effective tree risk management. At the time of writing the Council has purchased the “CONFIRM” asset management software package which is in the process of being rolled out.

5.0 Quantification of the Tree Resource and Age Class Structure

5.1 An in house survey of Stirling Council assets in 2007 recorded 10500 individual trees and 1485 hectares of managed woodland under council ownership. The exercise was not carried out by experienced tree surveyors and so limited information was recorded against each tree. As a result, there is no comprehensive picture as to the age class structure, condition or location of the tree population including woodlands with no heritage, veteran or potential veteran trees (which are also a visitor attraction) identified.

5.2 A survey carried out in 2011 by an independent arboricultural consultant of the Stirling Town Centre street trees found that out of 404 trees, over half were mature specimens with **young and semi-mature specimens poorly represented**. It is believed these results are a fair reflection of the street tree population as a whole throughout the Stirling area and that this situation must be addressed as part of an overall **planned tree management programme to reduce the risks from an ageing tree population**.

5.3 A full and comprehensive inventory of Stirling Council’s tree and woodland assets would provide key information to aid effective management of the tree resource. A better picture can be built up which allows identification of areas which have mature tree populations perhaps made up of known species with certain characteristics which have a higher propensity for failure (Lonsdale, 1999).

6.0 Complaints Notification of Dangerous or Nuisance Trees

6.1 Much of Land Services officer and supervisor time is spent dealing with complaints and enquiries from the general public via LAGAN and telephone enquiries. Much of these are concerned with trees perceived as “dangerous” or a “nuisance” e.g. branches encroaching onto buildings, swaying in the wind, obstruction of light and/or television signals.

6.2 The utilisation of local government websites can greatly reduce time spent dealing with telephone enquiries and complaints with the provision of a comprehensive Frequently Asked Questions (FAQ’s) section and a comprehensive “Tree Management Policies” document. The aim is to have complaints made online to reduce the demands on Land Services officers.

6.3 In addition, the provision of a dedicated **tree management policy** document would greatly assist Land Services staff with customer enquiries by having a reference which clearly states the council’s standpoint on the most common of tree related issues. (the 2010 LDP Topic Paper 28:Forestry Trees and Woodlands paras 6.6.3 and 6.6.1 identified a need for tree policies). Such key information should be made available to the public via an easily navigated website.

7.0 Direct Workforce with Tree Inspection Skills

7.1 At the time of writing, thirty Council employees hold a “Basic Tree Inspector” LANTRA qualification which allows them to *“identify a hazardous tree, determine the level of risk and then decide on an appropriate course of action.”*

7.2 The Land Services Tree and Woodland Officer holds the “Professional Tree Inspector” LANTRA qualification which allows identification of defects and the specification of *“necessary remedial works and to record the inspection process...”* However, there are proposals for another four members of staff to attend the Professional Tree Inspector LANTRA training in September 2015.

7.3 Existing Basic Tree Inspection skills with respect to day to day tree risk management are under utilised and should form part of routine work and/or site checks near to trees or groups of trees particularly after storm events. The more members of Land Services staff with this level of qualification will mean “more eyes on the ground” with more trees identified and **recorded** as part of routine site visits.

7.4 The council should commit to refreshing and investing in the advancement of skills where appropriate e.g. 3 day Professional Tree Inspector Qualification or the Arboricultural Association's Technicians Certificate in Arboriculture (AATech Cert) which could be extended to perhaps a Land Services Officer, Supervisor or Ranger with a longstanding experience of trees.

8.0 Council Services with Responsibility for Trees – Land Services

8.1 Land Services (now under the umbrella of Housing and Environment) alone has eight sub services which have direct responsibility for trees;

8.1.1 Grounds Maintenance – responsible for street trees and trees in public parks and respond to requests from other services regarding trees e.g. Roads and Housing. Currently divided into two main geographical areas; “Bruce” and “Wallace” which have responsibility for designated **urban (neighbourhood) and/or rural settlements** (Appendix 1) with two Land Services officers and four supervisors each with their own grounds maintenance team.

8.1.2 Ranger Service– currently two rangers and one Modern Apprentice (MA) responsible for site safety checks and maintenance in open spaces, biodiversity, tree planting, educational programmes and community involvement. Recently engaged in pest and disease surveys, tree mortality rate surveys (“beat up” survey), basic tree inspections, improvement of visitor enjoyment of prominent sites via marking and thinning out trees at viewpoints etc.

8.1.3 Play Maintenance– responsible for play equipment maintenance and safety checks which include trees within or adjacent to the play area. The team of four plus one Land Services Officer have considerable tree and woodland expertise and chainsaw skills. At the time of writing, three members of the team now have tree climbing skills.

8.1.4 Trees and Woodlands - responsible for developing and assisting in the management of street trees and existing woodlands, development of tree risk management programme, improvement of communication between various council divisions regarding tree related issues, provision of advice where operations impact on long term retention of existing trees, raising the importance and requirement for an increase in tree cover within the council and engaging external expertise where required.

8.1.5 Fisheries - team comprises one Fisheries Officer and one bailiff with chainsaw skills, involved in vegetation control along riverbanks, thinning of trees to improve river views, and increase community involvement.

8.1.6 Cemeteries – the team is made up of one Land Services Officer, one supervisor with a maintenance team. Part of the team’s duties involve tree maintenance in cemeteries and churchyards and planting of memorial trees. There is a strong interest from this service in promotion of further tree planting to enhance the biodiversity of burial grounds.

8.1.7 Projects – comprise a Team Leader and one Assistant Project Officer – responsible for the development and implementation of specific projects including new play parks, park masterplans, attaining green flag status for public parks and engaging sub-contractors to carry out tree planting.

8.1.8 Grass Maintenance – this team has one full time officer responsible for the recruitment of a largely seasonal grass maintenance team. Operations include the use of ride- on mowers, pedestrian mowers and trimmers in and around the base of trees. Many trees have sustained extensive damage to the outer bark, in some cases leading to death of the tree. More recently, the permanent formation of “tree rings” and application of mulches around the base of trees have helped prevent this type of damage. However, **briefing teams as to best practice** prior to the grass season is essential.

9.0 Council Services with Responsibility for Trees – Other

9.1 Housing and Environment - Roads –Trees within a 30mph limit are the responsibility of Land Services. However, advice is given by Land Services regarding utilities or road repairs affecting street trees both within and outwith this speed limit zone. All other trees outwith the 30mph zone are responsibility of Roads and Transport. The service is divided into three areas and responsibility is designated to individual teams within roads. Trees on trunk roads and motorways are **NOT** Stirling Council responsibility but come under BEAR or AMEY eg A84 carriageway.

9.2 Housing and Environment - Bridges and Flooding– trees threatening the stability of bridge structures or obstructing water flow are dealt with by this service which utilise roads squads or external contractors to carry out works. Land Services are usually consulted on operations likely to affect trees.

9.3 Housing and Environment – Housing – responsible for trees located within council owned properties and open space. Land Services receive daily requests from housing to investigate issues with trees usually involving blockage of light/views, television satellite signals, damage to pipes, driveways and footpaths, proximity of trees to wall/fence boundaries and

conservatories/garages etc. Many trees are removed to avoid further conflict and no records currently exist for replacement planting to compensate for loss of tree cover. A **felling licence** may be required in some instances and the service has been made aware of this.

9.4 Planning Services, Corporate Operations, – one part time tree officer is based with planning officers in a separate building to the Land Services team. The officer deals with protected trees on private land and conservation areas and has good communication with the Land Services Tree and Woodland Officer particularly where protected trees are affected by roads and utilities operations. However, much more is required in terms of **enforcement of planning conditions** designed to **protect trees** during development and the use of **BS5837 (2012)** industry best practice guidelines. This has recently been highlighted by incidences of developers not following best practice in all but the most visible of locations.

10.0 Current Approach to Tree Works

10.1 Several main contractors are engaged to quote for the majority of Land Services tree work and are experienced tree surgeons with varying levels of arboricultural knowledge and expertise.

10.2 The Land Services Play Maintenance team now have climbing skills and over a three month period to July 2015 saved the Council around £10,000 in tree work contractor costs. They have also been able to respond quickly to dangerous trees.

10.3 The Fisheries service carries out some tree work but only work which does not require tree climbing skills and is aligned with sections of the Fishery.

10.4 A prioritised and scheduled maintenance programme of work could be distributed more cost effectively between existing contractors and the direct workforce where appropriate. The lack of **planned and programmed** maintenance is likely to lead to an increasingly dangerous proportion of hazardous trees.

10.5 Contractors' qualifications and experience, contracts and scope of works are reviewed on an annual basis to assess if the council are getting value for money. The council should also consider further investment of **advanced chainsaw and tree climbing skills within the Land Services maintenance team.**

11.0 Working Practices Which May Lead to Unsafe Trees

11.1 Mature street trees are the most likely candidates for developing potential hazards which may become a significant risk due to unknown past maintenance works e.g. road and/or pavement repairs, utilities installations which may have damaged/severed major supporting roots underground within an already inhospitable rooting environment.

11.2 Roots are usually unable to grow beneath the road surface and often have a very asymmetric root architecture with the tree depending on roots growing away from the road for anchorage, water and nutrient uptake.

11.3 Council services and external working partners including statutory undertakers **should be encouraged to follow** current industry guidelines (para 11.4) when working in close proximity to trees or within the root zone. Severance of major roots particularly on the windward side can lead to both instability and decline of the tree. Notification should be given to the relevant council service prior to works being carried out.

12.0 Industry Best Practice and Statutory Protection

12.1 Stirling Council should be making full use of the published guidelines, British Standards (BS) and statutory protections when dealing with and specifying tree works. The following list identifies relevant publications and Acts of Parliament relative to tree works which have potential to damage trees leading to unsafe and/or removal of trees;

- BS5837:(2012) Trees in relation to design, demolition and construction- recommendations
- BS3998:(2010) Tree Work - Recommendations
- Best Practice in Street Works and Highway Works (2001) clearly states that statutory undertakers have a duty to protect the environment.
- National Joint Utilities Group (NJUG) Vol 4 (2007), Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees
- Specification for the Reinstatement of Openings in Roads Third Edition (Scotland) June 2012 S1.10 approved under s130 of the New Roads and Street Works Act (NRSWA) 1991 places a statutory duty to follow the NJUG Vol 4 guidelines.
- Well Maintained Highways – Code of Practice for Highway Maintenance (2005) confers duties and obligations specific to trees, in particular the need for regular inspections by suitably trained inspectors.
- The Roads Scotland Act 1984 sections 50, 83, 91, 92 is worth mentioning here as it confers powers and duties on local authorities with respect to safety of trees endangering

or obstructing passage of vehicles and pedestrians. It follows that any works to roads should ensure trees are left in a safe condition and do not subsequently pose a liability resulting from poor working practices.

11.5 Mature street trees have been observed with “girdling” roots i.e. roots which effectively strangle the tree and prevent development of effective structural supporting roots. This should be detected at the time of planting when the root ball or root system is inspected for such anomalies prior to planting. Ideally a sample of the tree stock should be inspected at the supplying nursery **before purchase.**

11.6 Although outwith the scope of this report, it should be noted that the decline of recently planted street trees (both by contractors and the direct workforce) is largely due to planting methods i.e. at the wrong depth. Steps should be taken to refresh these skills within Stirling Council and ensure that written specifications are issued to contractors and the direct workforce prior to planting. Note; planting workshop for fifty employees was completed November 2013.

13.0 Communication Between Those Responsible for Trees

13.1 Stirling Council has a healthy proportion of skilled staff across the services who are responsible for trees. Improved dissemination of tree related information and best practices to be employed should continue to be promoted by the Tree and Woodland Officer, **supported by senior management.**

13.2 Better co-ordination of tree work and maintenance operations can be developed through increased communication between the Land Services Tree and Woodland Officer and other service officers with responsibility for trees.

13.3 Every opportunity should be taken to promote best working practices in relation to tree works and those responsible for trees in Land Services in the first instance, should meet regularly as a team to discuss together how management of the tree stock could be improved in relation to their own responsibilities and those of others in the service **e.g. as part of the Land Services officer team meetings.**

13.4 Statutory undertakers and developers should be made aware of their responsibilities regarding works in and around trees. Stirling Council staff should report any incidences where it

is clear best working practices are not being followed to the Land Services Tree and Woodland officer.

14.0 Why the Need for a Tree Risk Management Strategy?

14.1 Duty of Care and Best Practice

14.1.1 Stirling Council has both a common law duty of care as defined by the Occupiers Liability (Scotland) Act 1960 and a statutory duty of care under the Health & Safety at Work Act etc 1974, section 3 (1). Other legislation conferring a statutory duty include the Land Reform (Scotland) Act 2003, Roads (Scotland) Act 1984, Town and Country Planning (Scotland) Act 1997, Wildlife & Countryside Act 1981, Nature Conservation (Scotland) Act 2004.

14.2 **Established Case Law** (Appendix 2) has laid down standards and principles under which the actions of tree owners can be scrutinised in the event of a claim arising from a hazardous tree. More recently, the inquest into the death of Mr Michael Arthur Warren in 2012 involved the sudden failure of a large severely unbalanced branch overhanging the road which fell and hit Mr Warren's car resulting in his death. This led to the first Prevention of Future Deaths report issued by the Coroner to the owners of the tree, Bracknell Forest Borough Council relating to the training of roads inspectors checking trees and the manner in which "drive-by" inspections are carried out (Appendix L).

14.3 **What are the Courts interested in?** – An article by Jeremy Barrell (Barrell, 2013), an Independent Arboricultural Consultant and Expert Witness in several high profile cases including Warren v Bracknell Forest Borough Council 2012, discusses what the courts are interested in regarding tree failures. This would appear to be what is **reasonable** in the circumstances of each case and whether the harm was **foreseeable** and what was **done** about it, especially in the context of available resources i.e. was the management response **proportionate**. Mr Barrell also states that assessing the level of risk is not a primary consideration of the courts and seems to have "distracted attention from the real issues" which are **assessing foreseeability of tree failure and steps taken to abate the threat** of harm from tree failure.

15.0 What are the Risks from Trees and What is Required to Mitigate that Risk?

15.1 The following extracts from the HSE document "Management of Risk from Falling Trees and Branches" (SIM 01/2007/05, 2013) provides the following guidance;

What is the risk?

*Each year between 5 and 6 people in the UK are killed when trees or branches fall on them. Around 3 people are killed each year by trees in **public spaces**. Thus the risk of being struck and killed by a tree or branch falling is **extremely low** (in the order of **one in 10 million for those trees in or adjacent to areas of high public use**). However the **low level of overall risk may not be perceived in this way by the public, particularly following an incident.***

*The average risk is firmly in the “broadly acceptable” region of the tolerability of risk (see para 15.3) triangle published in HSE’s “Reducing Risks Protecting People”. However, “Reducing Risks, Protecting People” explicitly states that “**broadly acceptable**” is a **general guide** and not a definitive statement of what is **reasonably practicable in law**.*

What is required?

*Employers and persons carrying out undertakings or in control of premises all have duties under the HSW (Health and Safety at Work) Act. In particular, there is **the duty to do all that is reasonably practicable to ensure that people are not exposed to risk to their health and safety.***

*Doing all that is reasonably practicable does **not mean that all trees have to be individually examined on a regular basis**. A decision has to be taken on what is **reasonable in the circumstances** and this will include **consideration of the risks** to which people may be exposed.*

*Around **half** of all fatalities due to falling trees or branches occur in **public spaces**, such as a park or beside roads, so Section 3 HSW Act may be applicable. Whilst HSE may regard the average risk as extremely low, **the law requires that where reasonably practicable measures are available, in individual cases, they should be taken.***

15.2 The document also states that: “Given the large number of trees in public spaces across the country, control measures that involve **inspecting and recording every tree would appear to be grossly disproportionate to the risk.**”

15.3 The HSE “Tolerability of Risk” (ToR) triangle is a visual presentation of the general annual risks of death from falling trees where the “Broadly Acceptable” region represents 1:1,000,000 and the “Tolerable Region” represents a risk of 1:10,000 where this particular level of risk should be managed as “low as is reasonably practicable” (ALARP).

15.4 It is understood that landowners have limited resources to inspect every single tree every year but it is reasonable to **expect tree owners to exercise pro-active and competent tree risk management.**

15.5 Best practice identified in the literature Trees in Towns II (2008) identifies that steps should be taken to develop and implement a tree risk management strategy and that it should be;

- Pro-active – planned, rolling programme of work identified from regular inspections
- Prioritised – according to level of risk, risk zoning according to the **level of occupancy in and around tree(s).**
- Actioned – clear lines of communication, responsibility, delegation, frequency of re-inspection identified.
- Recorded –preferably computerised data collection with a clear audit trail.

15.6 The strategy must be supported by dedicated and realistic resources for its successful implementation and ongoing maintenance.

16.0 A Dedicated Resource for Effective Tree Risk Management

16.1 The annual overall budget for Stirling Council stands at £250million with £5million allocated to Land Services (2012/13). There is no specific amount allocated to the management of trees, however, investigation revealed that annual expenditure on tree works averages at around £100,000 which includes the use of external consultants and contractors for tree inspections and tree works respectively.

16.2 The Trees in Towns II report published in 2008 indicated that money spent on individual trees (in English Local Authorities) ranged from an average of £1.38p up to £4.93p per head of population. Based on these figures and a population size similar to Stirling Council of 91,000 people, a dedicated tree budget for Stirling Council could be anywhere between **£126,000 and £449,000** to ensure effective and sustainable management of the tree population.

17.0 Additional Funding to Support the Tree Budget

17.1 Additional funding could be generated to supplement the Council's tree budget and support the overall tree management programme. Edinburgh City Council currently have Service Level Agreements (SLA's) in place with Housing and Cemeteries which generated around £57,000 additional income to their tree management budget for the year 2012/13 (personal communication¹). This averages out at a **£5 charge per tree** to include routine inspections and

tree maintenance). The figures were derived from survey costs carried out on one neighbourhood settlement and applied to a remaining five settlements estimated at 11450 trees in total.

18.0 Progress to Date with Stirling Council Tree Risk Management

- **Asset Management System** – As at July 2015, the CONFIRM asset management system has been purchased by Stirling Council. This is a “fit for purpose” system currently employed in other local authorities across Scotland.
- **Designation of Risk Zones**–For the purposes of a tree risk management strategy, High Medium and Low Risk Zones must be identified within the Stirling Council area and prioritised for planned inspections. As at July 2015 all areas have been risk zoned with at least one third designated as High Risk Zones on the existing ArcMap GIS mapping system (Location Centre).
- **Existing Street Tree Survey Data** – Approximately 10500 trees were entered on the ArcMap system as “points” with limited information input to the individual tree record as part of the asset capture exercise in 2007 for the OSS.
- **Existing Woodland Data** – 1485 hectares of council managed woodlands including Pleun Country Park are shown as polygons on ArcMap but no inspection data for woodland or groups of trees growing within falling distance of footpaths is attached to individual records.
- **Young/Recently Planted Street Trees** – although this category of the tree resource does not at present pose a risk due to their age class and size of tree parts e.g. branches, main stem, it is important these are included in an asset management system for overall tree management purposes. Currently no management or post planting maintenance data exists for these particular trees.

19.0 Action Points Required

- Complete Risk Zoning of Stirling area and identify existing paper surveys within Land Service folders for which key data is not yet uploaded onto the current ArcMap system. (complete as at July 2015)
- Purchase a “fit for purpose” tree asset management package along with an adequate amount of fully capable data collection devices. (complete as at 2015)
- Approve and implement the proposed Stirling Council Operational Tree Risk Management Strategy (STORMS 2014). (under review as at July 2015)
- Engage an independent qualified and experienced tree inspector/surveyor initially for a period of six months with priority given to identifying the full extent and condition of the

tree resource based on the urban and rural settlement stratification method discussed in SECTION II, and specify any necessary tree works. (not programmed as at July 2015)

- Draw up clear instructions/brief for the inspector/surveyor to avoid ambiguity and to ensure the council is getting exactly what it requires for effective tree risk management which includes a **uniform approach** to tree risk assessment. (complete as at July 2015)
- Allocate at least one day a week from the Stirling Council Tree and Woodland Officer time to supplement inspections where required/requested by Land Services team and to liaise on progress with the inspector/surveyor. (as and when required)

SECTION II- Development of the Tree Risk Strategy

1.0 Overview

1.1 The urban (neighbourhood) and rural settlements identified in the Open Space Strategy mentioned earlier in this report have been used as a means of stratifying the street tree and woodland resource into “management units” per settlement area.

1.2 Each settlement will have designated High, Medium and Low “Risk Zones” according to the criteria identified later in this section of the report. The order of priority for management and inspections will primarily be based from highest to lowest population density per settlement and corresponding HIGH risk zones within those settlements moving on to Medium and Low risk zones. i.e. the reasoning being that places with higher population densities are more likely to be within close proximity to trees in the Stirling area given the Open Space Strategy conclusions that “no one is more than 300m from a publicly accessible open space”. These open (public) spaces were categorized (per Planning Advice Note 65) as follows;

- Public Parks
- Amenity space
- Playspace
- Sports areas
- Woodland + semi natural space
- Institutional space.

1.3 A tree inventory would identify and plot individual and/or tree groups within each settlement on the asset management system e.g. CONFIRM, whereas a tree inspection will record trees requiring remedial works along with required data and information depending on the level of inspection required.

1.4 It is intended that with respect to overall tree management, this approach will be adopted but with the addition of an **Operational Plan** (example at Appendix 3) of routine and planned operations per tree population, per settlement. Further discussion of this is outwith the scope of this report.

1.5 A tree risk management strategy should be well researched, follow peer reviewed risk management guidelines and best industry practice.

2.0 Development of a Tree Risk Management Strategy for Stirling Council

2.1 The proposed Stirling Council tree risk strategy has been developed through research into six existing council strategies (Walsall, Lancaster City, Bristol City, Rushmoor Borough, North Somerset and Southampton Local Authorities), literature from the Health and Safety Executive in respect of managing the risk from trees and published industry best practice and guidelines.

2.2 The industry guidelines include the National Tree Safety Group's (NTSG) publication *Common Sense Risk Management of Trees* (2011) and the most recent literature on tree risk assessment published by the International Society of Arboriculture (ISA) and presented at the Arboricultural Association's Amenity Conference in September 2013, *Tree Risk Assessment* guide from the ISA's Best Management Practices series.

2.3 The Southampton Local Authority Tree Risk Operational Management Strategy (STORMS) was cited as an example of tree risk management best practice in the *Trees in Towns II* (2008) research document and will form the framework of the Stirling Council proposed tree risk management strategy along with the literature and industry guidelines mentioned previously.

2.4 Southampton Local Authority reported that the outcome of implementing the STORMS system was, after an initial period of urgent and planned works (which saw an initial increase in budget spend), resources were utilised more efficiently in planning for tree management. Relations between the tree section and the local community were improved as a direct result of the system's implementation.

3.0 Key Steps in Tree Safety Management

3.1 The NTSG guidelines state that tree owners should take a balanced, proportionate and cost effective approach to tree management and that a tree safety strategy should cover three essential aspects:

1. Zoning: appreciating tree stock in relation to people or property
2. Tree inspection: assessing obvious tree defects
3. Managing risk at an acceptable level: identifying, prioritising and undertaking safety work according to the level of foreseeable risk.

4.0 Prioritise and Identify Risk Zone Categories

4.1 Risk zones are prioritised with particular attention paid to the **nature and location** of trees. For example, street trees, including roadside trees and trees adjacent to main arterial roads and in city and town centres, would normally come under a high risk zone as would trees adjacent to frequently used footpaths within an urban woodland which provide main connections for pedestrian access.

4.2 The criteria for risk zoning of the Stirling Council area is based on the model adopted by the Southampton Council STORMS strategy (Appendix 4). Zones are colour coded to represent **High Moderate and Low** risk zones (Table 1).

4.3 Table 1 Stirling Council Risk Zone Categories

Risk Zone Categories	Colour Codes	Examples
High Risk	Red	<p>To be inspected within 1 or 2 years¹</p> <ol style="list-style-type: none"> 1. Schools (high usage areas)² 2. Playgrounds and play areas 3. Arterial road traffic routes and pedestrian pathways (A & B roads, motorways)³ street trees. 4. High use areas in parks 5. Emergency facilities i.e. Hospitals, fire and ambulance stations. 6. Council trees near Railway lines 7. Top Priority Trees (TPT) (in Mod/Low risk zones) Street trees, Heritage/Veteran trees
Moderate Risk	Yellow	<p>To be surveyed within 3 years¹</p> <ol style="list-style-type: none"> 1. Shopping centres 2. Cemeteries (high use areas) 3. Bus routes 4. Public car parks 5. Schools (low use areas)⁵ 6. Public buildings and community centres 7. Preferred emergency access routes⁴ 8. Work depots
Low Risk	Blue	<p>To be surveyed within 5 years¹</p> <ol style="list-style-type: none"> 1. Secondary roads and footpaths³ 2. Residential OAP homes (council owned) 3. Cemeteries (low use areas) 4. Residential car parks 5. Public Parks (low use areas) 6. Woodland boundaries and footpaths 7. Allotments 8. Low use roads³ 9. Council housing gardens and cutways 10. Other open spaces

Notes to Table 1:

1. A Basic Tree Inspection (Level 1) will be carried out by a qualified LANTRA Basic Tree Inspector who will identify trees with **obvious defects** (Appendix G) specify works required within the work priority response times (Appendix D). If further investigation is required to specify remedial works this will be carried out by LANTRA Professional Tree Inspector (Level 2) who may recommend an advanced inspection using a specialist technique (Level 3) in the case of a high amenity tree (Appendix E) to be carried out by a fully qualified experienced individual e.g. Professional Tree Inspector, Arboricultural Technician/Consultant.
2. School playgrounds, congregation areas, entrances/exits and outdoor classrooms.
3. Based on the Department for Transport (DfT) road classification scheme and perceived public usage.
4. As defined by Stirling Council's Emergency Service.
5. Other school areas outside those defined in item 2.

4.4 A Risk Zone map will be developed using the neighbourhood and rural settlements identified in the Open Space Strategy. The zones within each settlement should be subject to regular ongoing review for accuracy and appropriateness of the zones and any subsequent modifications explained and recorded in the strategy document.

5.0 Tree Inspection and Tree Risk Assessment Methodology

5.1 The Visual Tree Assessment (VTA) inspection method (Mattheck and Breloer, 1994) is based on the assessment of visual indicators (both biological and mechanical) displayed by the tree e.g. swellings or bulges can indicate internal cracks or decay as a result of damage or stress, dieback in the crown can be an indicator of poor root health, some co-dominant stems with included bark become a structural defect and may result in mechanical failure. This method adopts a systematic approach and proceeds in three stages;

- 1. Visual inspection for defect symptoms and vitality. If there is no sign of a problem, the investigation is concluded.*
- 2. If a defect is suspected on the basis of symptoms, its presence or absence must be confirmed by thorough examination.*
- 3. If the defect is confirmed and appears to be a cause for concern, it must be measured and the strength of the remaining part of the tree evaluated.*

5.2 Obvious defects in trees “are likely to be so apparent that most people, whether specialist or not, would recognise them.” (NTSG, 2011). Such structural and biological anomalies in trees take many forms and not all are a significant hazard. With inadequate understanding defects may be perceived as being synonymous with “hazard” and that the hazard should be associated with “risk”. The reality is that a defect poses risk only where there is a **likelihood** of harm;

Risk v Hazard

Arborists and Foresters have used the term **hazard assessment** to describe the process of inspecting and evaluating the structural condition of trees and the harm that could occur if it failed. The more accurate and appropriate term **risk assessment** is now standard.

A tree is considered **hazardous** when it has been assessed and found to be likely to fail and cause an unacceptable degree of injury, damage, or disruption—that is, it poses a high or extreme risk.

Risk is the combination of the likelihood of an event and the severity of the potential consequences.

A hazard is a likely source of harm. In relation to trees, a hazard is the tree part(s) identified as a likely source of harm.

Fig 1 Source: (ISA) Tree Risk Assessment Best Management Practices 2011

- **Hazard** is related to nature of the defect found on an individual tree and its potential to fail e.g. significant decay fungi, cavity (Matheny and Clark, 1994)
- **Risk** is related to the location of the tree and the ‘target’ i.e. the level of damage it could cause given its location and frequency of use (occupancy) under and around the tree e.g. busy shopping centre, frequently use footpaths (Lonsdale, 1999; Mynors, 2002)
- **Occupancy rate** is defined as the amount of time people are within the target zone ie where tree or branch may fall classified as “constant, frequent, occasional or rare” (ISA, 2011)

5.3 The NTSG guidelines state that unless the risk of harm arising from a hazard is properly taken account of i.e. properly **assessed**, owners of trees can be misinformed leading to potentially costly and unnecessary intervention not to mention the unnecessary loss of trees.

“a proper assessment of trees and of any associated risks is the correct basis for deciding whether to carry out remedial action. Such action should not be carried out as a substitute for proper assessment.” (Lonsdale, 1999).

6.0 Level of Inspections and Scope of Tree Risk Assessment

6.1 The NTSG UK guidelines recommend three levels of inspection:

- informal observations
- formal inspections
- detailed inspections.

6.2 However, the recently published ISA Tree Risk Assessment handbook forms part of a series of publications known as “Best Management Practices” which are intended as a “guide for practising arborists, tree workers and their supervisors”. The Tree Risk Assessment publication contains very useful and detailed information based on current research and identifies criteria for three inspection levels and a tree risk rating process for individual trees.

6.3 The ISA’s three levels of inspection are;

- Level 1: Limited Visual Assessment – includes tree inventories and identification of “obvious defects”.
- Level 2: Basic Assessment – a detailed visual inspection of the whole tree and its immediate surroundings, collection of data, usually leading to a tree risk hazard rating.
- Level 3: Advanced Assessment – requiring specialised expertise and equipment, data collection and analysis, e.g. Picus Tomograph decay detection technology.

6.4 The United Kingdom’s Sector Skills Council LANTRA currently offers training for two levels of competency for tree inspections. These are the **LANTRA Basic Tree Inspector (BTI)** and the **LANTRA Professional Tree Inspector (PTI)**. The first is a one day course for those with no prior experience or knowledge of working with trees which trains a person to identify “obvious defects” in trees which may be a cause for concern. The second is an intensive three day course for those with prior experience and knowledge of tree biology to carry out a more detailed level of inspection and reporting identifying defect symptoms and prescribing work recommendations to reduce the risk.

6.5 Stirling Council will use both LANTRA BTI and PTI qualified inspectors to carry out tree inspections. However, it is important to have a uniform and transparent approach for the risk management of Stirling Council’s tree populations, and it is proposed that the ISA criteria for three levels of inspection are adapted to suit the UK recognised competency levels for the **LANTRA** Basic and Professional tree inspector qualifications. The full criteria for each level of

inspection can be seen in Section III (STORMS 2014) and will serve as a guide for the Stirling Council tree inspection process whether in house or by external contractors.

7.0 Individual Tree Risk Hazard Rating

7.1 The purpose of tree inspections in a specified risk zone is to identify defective trees, assess the severity of the defects and recommend remedial works before tree failure occurs. A tree risk rating can help quantify the level of risk posed to public safety and may be used to support the prioritisation of works specified for potentially hazardous trees with “obvious defects”.

7.2 The ISA risk rating method employs the use of two matrices; one which estimates the likelihood of a tree failure impacting a specified target (Table 2) and another which arrives at an individual tree risk rating of either **Low, Moderate, High or Extreme** (Table 3). A minimum of Professional Tree Inspector can use this method of tree risk rating.

7.3 Whilst it is not the intention for Stirling Council to adopt wholesale this particular method of tree risk rating, it is a useful tool which can aid the decision making process regarding retention or removal of a tree.

7.3 Table 2. The matrix used to estimate the likelihood of a tree failure impacting a specified target

Likelihood of Failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

7.5 Table 3. Risk rating matrix showing the level of risk as the combination of likelihood of a tree failing and impacting a specified target, and severity of the associated consequences.

Likelihood of Failure and Impact	Consequences			
	Negligible	Minor	Significant	Severe
<i>Very likely</i>	Low	Moderate	High	Extreme
<i>Likely</i>	Low	Moderate	High	High
<i>Somewhat likely</i>	Low	Low	Moderate	Moderate
<i>Unlikely</i>	Low	Low	Low	Low

8.0 Work Priority and Response Times

8.1 Tree inspections will identify works required and these will be allocated for completion within a prioritised timescale according to the work categories illustrated in Table 4 below. The response times align closely with the roads service response categories.

8.2Table 4 Proposed Stirling Council Work Priority and Response Times

Proposed Funding	Category	Detail	Work Priority Response Time
Land Services Budget	Emergency	Response to trees that are confirmed as imminently dangerous. Area cordoned off until works complete.	2 hours maximum
	Urgent Work	Response to trees that are perceived to be dangerous but where work needs to be undertaken at a safe time. Area temporarily cordoned off if deemed necessary.	2 weeks
	Very High	Works on potentially hazardous trees identified through tree inspections.	Works to be completed within 1 month of inspection
	High	Works on potentially hazardous trees identified through tree inspections.	Works to be completed within 3 months of inspection
	Moderate	Works to abate or remove actual or potential nuisance caused by council owned trees eg obscured road signs, height clearance vehicles, trees close to walls/fences in danger of causing physical structural damage	Works to be completed within 6 months of inspection
	Low	‘Good neighbour’ issues e.g. reduce encroachment from council owned trees where damage to buildings highly likely	Works to be completed within 12 months of inspection
*Additional Funding Sources	Recharge	Housing/Cemeteries clients (Service Level Agreements) <i>Ad hoc</i> projects	As and when required
	Private Emergency	Emergency response to deal with hazardous private trees blocking or threatening highways	24 hours maximum
	Private Planned	Agreed works to deal with hazardous trees e.g. on Council leased land	As and when required

*Requires further Investigation

8.3 All works identified will be actioned and the specified completion date added to the individual tree record stored on the (CONFIRM) asset management system database.

9.0 Key Operational Strategy Statements

A series of key operational statements is included in Section III, the proposed STORMS 2014 operational document. Essentially these statements identify the aim and scope of the tree risk management strategy.

10.0 Measuring Performance: - The following local indicators have been identified to measure the performance of a Tree Risk Management Strategy for Stirling Council. This will be subject to review once baseline data has been built up;

- Percentage of work on council owned trees in the emergency and urgent category (target annual reduction).
- Percentage of planned work undertaken on time (target annual increase).
- Number of incidents recorded in the failure log each year (target annual decrease).

11.0 Annual Review of the Tree Risk Strategy - is necessary as the tree stock grows and changes or as new building developments take place e.g. via the planning department.

12.0 The Land Services Budget: - The budget available for undertaking tree work should be subject to regular review in the light of developing priorities. A dedicated tree management budget is considered essential to drive the tree risk management programme forward.

13.0 Conclusions and Recommendations

13.1 The action points raised in Section I paragraph 19.0 should be completed as soon as possible. In particular, installation of the new CONFIRM system will enable implementation of an effective tree risk management programme and demonstrate its commitment to discharging its duty of care.

13.2 Identification of the remaining Medium and Low risk zones per settlement to be completed and uploaded onto existing system by end of April 2014. (complete as at July 2015)

13.3 Stirling Council must progress from a reactive to a pro-active approach to tree risk management.

13.4 External consultant expertise should be engaged for a fixed period to update and complete a **cost effective** full inventory and condition survey of the tree and woodland resource based on a clear brief outlining the proposed methods of inspection and risk assessment detailed in this report. This will promote a uniform approach to the risk management of Stirling Council's tree population.

13.5 Once the extent of the tree resource is realised and the initial works quantified further planning and maintenance of the tree risk management system can be implemented. It is likely further consultant time may be required to keep on top of scheduled inspections in the long term given the limited resources Stirling Council currently has for tree management.

13.6 It is clear that there are numerous council services with direct responsibility for trees. Clear lines of communication should be established between key staff responsible for commissioning tree works with the roles and responsibility of each service clearly identified.

13.7 Clear written specifications for tree works should be issued to contractors and the direct workforce to ensure compliance with industry best practices. Tree works also includes new plantings.

13.8 Complaints and enquiries from members of the public could be addressed in the first instance via a comprehensive FAQ section on the council's website and/or an easily accessible policy document for tree related issues. (**Note** draft tree management policy document under review as at July 2015.)

13.9 Existing basic tree inspection skills within Land Services should be further utilised with respect to routine site checks to identify potentially hazardous trees. Consideration should be given to the advancement of skills within the direct workforce where appropriate.

13.10 The operational tree risk management strategy developed and identified in this report should be adopted and implemented as soon as possible and be supported by dedicated and realistic resources. (a budget is identified as being anywhere from £126,000 to £449,000 based on Trees In Towns II research) to ensure its effective delivery and maintenance long term. The strategy will discharge the council's duty of care to its residents and visitors and should form part of a specific strategic Urban Forest Management Plan.

13.11 An annual review of the strategy must be carried out to take account of the growing tree stock and its effect on the designation of risk zones.

13.12 Stirling Council should promote best working practices at every opportunity both across the council services and to external working partners e.g. developers and statutory undertakers. The council should make better use of the statutory powers and industry standard guidelines available to them to ensure Stirling's valuable tree asset is not needlessly lost or irreversibly damaged in any way.

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APPENDIX 1

Stratification of Council Area by Settlement

[illegible]

Caminer v. Northern and London Investment Trust Ltd [1951]

This is a case where a tree collapsed from private property into the road, damaging a passing car and the driver. Although in this instance the Trust was found not to be negligent the following was said in the judgement “it is the duty of all owners of property to manage it in accordance with good estate management ... Good estate management involves the **inspection** and the trimming of trees...”

Quinn v. Scott [1965]

The following are taken from the judgement “... a landowner on whose land a belt of trees stood, adjoining a busy highway, was under a duty to provide himself with skilled advice about the safety of the trees...”

“The good landowner - using the word good in its moral sense - does not ruthlessly cut down every tree growing on his land as soon as it would pay him to do so. He has some regard for the beauty of the tree and of the countryside ... and have in mind what is called the amenity value of growing trees.” Judge Glyn-Jones.

Gary Poll v Bartholomew Viscount Asquith of Morley and another [2006]

This case confirmed the responsibility of roadside tree owners to carry out appropriately detailed tree inspections by a **competent person** (here a ‘level 2’ surveyor i.e. minimum Professional Tree Inspector certification, requiring a specialist not a generalist).

Birmingham City Council – [1999]

The HSE prosecuted the Council under s3 (1) of the Health and Safety at Work etc Act for failing to ensure the safety of those not in its employment. The HSE had served an Improvement Notice on the Council in 2001 requiring their tree management systems to be reviewed. The facts are that a diseased Ash tree toppled across both lanes of a road in high winds and killed 3 people. The Council was fined £150,000 and had £56,000 costs awarded against it. Judge Richard Wakerley QC said: "The condition and the danger the tree presented would have been **obvious** to anyone making a close inspection of that tree."

Albert Atkins v Sir James Scott August 2008

This case involved a collision between a motorist and a fallen branch. The motorist made a claim against the tree owner for damages. Judgement was awarded in favour of the defendant.

The predominant issue in this case was whether or not a crack present on the failed branch was visible from the ground by an observer. It was subsequently deemed that the crack could not have been easily seen and “a careful ordinary inspection of the tree would not have revealed its existence” as such the resulting failure and collision must be classed as an accident.

Warren v Bracknell Forest Borough Council 2012

Inquest into the death of Mr Michael Arthur Warren in 2012 involved the sudden failure of a large severely unbalanced branch overhanging the road which fell and hit Mr Warren’s car resulting in his death. This led to the first **Prevention of Future Deaths** report issued by the Coroner to the owners of the tree, Bracknell Forest Borough Council relating to the training of roads inspectors checking trees and the manner in which “drive-by” inspections are carried out.

[illegible][illegible]

Risk Zone Categories	Colour Codes	Examples
Very High Risk	Brown	<p>To be surveyed within 2 years</p> <ol style="list-style-type: none"> 1. Schools (high usage areas) 2. Playgrounds and play areas 3. Arterial road traffic routes and pedestrian pathways 4. High use areas in parks 5. Emergency facilities 6. SCC trees near Railway lines 7. Top priority trees in a lower risk area
High Risk	Yellow	<p>To be surveyed within 3 years</p> <ol style="list-style-type: none"> 1. Shopping centres 2. Cemeteries (high use) 3. Bus routes 4. Public car parks 5. Schools (low use areas) 6. Public buildings and community centres 7. Preferred emergency access routes 8. Work depots
Moderate Risk	Blue	<p>To be surveyed within 4 years</p> <ol style="list-style-type: none"> 1. Secondary roads (C roads) and footpaths 2. Residential car parks 3. Cemeteries (low use areas) 4. Residential car parks 5. Low use areas in parks 6. Greenways and woodlands 7. Allotments
Low Risk	White	<p>To be surveyed within 5 years</p> <ol style="list-style-type: none"> 1. Low use roads 2. Other open spaces 3. Council housing gardens and cutways

Source: Case Study no 7 Trees in Towns II (2008)

SECTION III

Stirling Tree Operational Risk Management Strategy (STORMS 2014)

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SECTION III - Stirling Tree Operational Risk Management Strategy (STORMS 2014)

1.0 Overview

The development and full justification for this operational strategy including referenced literature, is detailed within Sections I and II of the main report “Stirling Council Tree Risk Management Review and Recommendations (STORMS 2014)”. The aim of Section III is to provide a standalone document which can be utilised by operational staff and management for guidance and direction in the application of tree risk management.

2.0 Duty of Care and Best Practice

2.1 Stirling Council has both a common law duty of care as defined by the Occupiers Liability (Scotland) Act 1960 and a statutory duty of care under the Health & Safety at Work Act etc 1974, section 3 (1). Other legislation conferring a statutory duty include the Land Reform (Scotland) Act 2003, Roads (Scotland) Act 1984, Town and Country Planning (Scotland) Act 1997, Wildlife & Countryside Act 1981, Nature Conservation (Scotland) Act 2004.

2.3 The following extracts from the HSE document “Management of Risk from Falling Trees and Branches” (SIM 01/2007/05, 2013) provides the following guidance;

What is the risk?

*Each year between 5 and 6 people in the UK are killed when trees or branches fall on them. Around 3 people are killed each year by trees in **public spaces**. Thus the risk of being struck and killed by a tree or branch falling is **extremely low** (in the order of **one in 10 million for those trees in or adjacent to areas of high public use**). However the **low level of overall risk may not be perceived in this way by the public, particularly following an incident.***

What is required?

*Employers and persons carrying out undertakings or in control of premises all have duties under the HSW (Health and Safety at Work) Act. In particular, there is **the duty to do all that is reasonably practicable to ensure that people are not exposed to risk to their health and safety.***

*Doing all that is reasonably practicable does **not mean that all trees have to be individually examined on a regular basis.** A decision has to be taken on what is **reasonable in the circumstances** and this will include **consideration of the risks** to which people may be exposed.*

2.4 The document also states that: “Given the large number of trees in public spaces across the country, control measures that involve **inspecting and recording every tree would appear to be grossly disproportionate to the risk.**”

3.0 Key Steps in Tree Safety Management

3.1 The National Tree Safety Group (NTSG) publication “Common Sense Risk Management of Trees (2012) states that tree owners should take a balanced, proportionate and cost effective approach to tree management and that a tree safety strategy should cover three essential aspects:

1. Zoning: appreciating tree stock in relation to people or property
2. Tree inspection: assessing **obvious** tree defects
3. Managing risk at an acceptable level: identifying, prioritising and undertaking safety work according to the level of foreseeable risk.

4.0 Key Operational Strategy Statements

4.1 The Aim of Stirling Council’s Tree Risk Management Strategy

The strategy aims to provide and manage a sustainable tree resource that is as safe and as diverse as possible. Development Control work and Tree Preservation Orders (TPOs) are outside the scope of this document, however, the Land Services Tree and Woodland Officer and the Tree Officer for Economy, Planning and Regulation (responsible for development control, TPO and trees on private land) will liaise and work closely together on any issues arising. In addition, the strategy offers a **uniform approach** to the inspection and assessment of risk of Stirling’s tree populations.

4.2 Scope of Strategy - The strategy specifically addresses the likelihood of damage or harm caused by a tree failure (i.e. a limb falling or a tree falling over), it does NOT address other forms of damage that may be caused by trees (e.g. indirect damage subsidence on a **shrinkable** clay soil or direct damage caused by physical displacement of structures through tree growth).

4.3 Risk Zone Mapping (Appendix A): - Stirling Council’s neighbourhood and rural settlements are each stratified into High, Moderate and Low Risk Zones coloured red, yellow and blue respectively.

4.4 Risk Zone Model (Appendix B): Table 1 identifies the criteria for each designated risk zone. The model enables prioritisation of inspections and planned works within each settlement.

4.5 Individual Tree Risk Rating Matrices (Appendix C): - The Professional Tree Inspector may determine a risk rating as an aid to the decision making process for prioritisation of works for individual trees based on the ISA approach i.e. the combination of the likelihood of a tree failure, the likelihood of impact (Table 2) on a specified target (e.g. people, buildings, cars, roads etc) and the severity of the associated consequences which translate into a risk rating of Urgent, High, Moderate or Low (Table 3).

4.6 Work Priority Response Times (Appendix D): - Work generated by planned tree inspections will be prioritised according to the category identified in Table 4 and will correspond with associated priority response times as far as is reasonably practicable. All works identified will be actioned and the specified completion date added to the individual tree record stored on the (CONFIRM) asset management system database.

4.7 Levels of Inspection (Appendix E)

The International Society for Arboriculture (ISA) three levels of inspection have been adapted to align more closely with UK LANTRA Basic and Professional Tree Inspection qualifications and these will form the basis for the Stirling Council tree inspection process;

- Level 1: Basic inspection – includes tree inventories and identification of “obvious defects”.
- Level 2: Professional inspection – a detailed visual inspection of the whole tree and its immediate surroundings, collection of data - may lead to a tree risk hazard rating.
- Level 3: Advanced inspection – requiring specialised expertise and equipment, data collection and analysis, e.g. Picus Tomograph decay detection technology.

4.7.1 Based on a reasonable and proportionate approach given Stirling Council’s available resources, the scope of works will be identified for each level of inspection given the **nature and location** of trees. A **Level 1 Basic inspection can be** carried out by a qualified **LANTRA** Basic or Professional Tree Inspector. Any obvious or significant defects will be identified and recorded and remedial works specified within the inspection period. Depending on the experience of the inspector, a Level 1 inspection may progress there and then to a **Level 2 Professional inspection** involving more detailed examination and reporting. In cases where trees of high heritage or amenity and specimen value are located in a high risk zone, it is likely a **Level 3 Advanced inspection** will be carried out using non-invasive decay detection techniques (e.g. Picus Tomograph decay mapping technology) to establish the feasibility of retaining such trees.

Note . Currently 30 council employees within Land Services and Environment hold a Basic Tree Inspection award with 5 at Professional Tree Inspection level (Appendix F). Basic Tree Inspectors are qualified to identify obvious defects, specify work required or request further investigation by a Professional Tree Inspector before work is specified.

4.8 Tree Inspection Schedule and Documentation;

- The range of information collected depending on the level of inspection required can be seen on the Tree Inspection Schedules at **Appendices G1 and G2**. The documents includes an **explanation of terms** used in the schedule.

4.8.1 Frequency of Inspections: - CONFIRM asset management software will inform the frequency of inspection primarily based on the Risk Zone categories (Appendix B) along with associated planned works. However, Top Priority Trees (TPTs) may warrant a more frequent inspection interval i.e. trees perceived as a HIGH risk located in a LOW risk zone could have inspection frequencies ranging between 6, 12 and 18 months.

4.9 Tree Records and Accessibility - Any member of staff should be able to access records for each tree in response to a particular enquiry either from a member of the public or another council service e.g. Grounds Maintenance, Roads, Housing, and Planning. The purchase of the asset management system CONFIRM will facilitate easier handling and sharing of information across council services and in response to enquiries from members of the public.

4.10 Customer Enquiries: CONFIRM asset management system will facilitate the sharing of information; A contact centre operator will take and log a call as normal, via LAGAN. Once logged the asset management system database CONFIRM will record that there is a Land Enquiry and, with the correct parameters set up already within the system, send the call to the corresponding officer for the **settlement** in which the tree is located (**Appendix H**). All customer enquiries should receive an acknowledgement response within 15 days as per the Stirling Council **Tree Management Policies** document.

4.11 Tree Failure and Removal Log: - A failure and removal log will be created within the asset management system detailing all tree failures and the attenuating circumstances ensuring more information about tree failures and planned removals can be established by examining patterns e.g. geographical, exposure, soils, mechanical damage etc to aid future tree management planning.

4.12 Emergencies – Tree Related- Contact Centre open 24/7 Tel. 0845 277 7000

4.12.1 Stirling Council will aim to attend emergency tree incidents within 2 hours of notification to assess the situation and start the process of making the site safe. In the first instance, this will include taping/blocking off access to the dangerous tree from members of the public and erecting warning notices if necessary.

4.12.2 Trees are designed to move in the wind to limit breakage, and the movement of stem and branches is not in itself a dangerous sign. It is however, not possible to guarantee that any tree will not fail, as even the healthiest may succumb in the most extreme weather conditions.

4.12.4 Situations Regarded as Emergency:

- Tree snapped or blown over near roads houses, areas of frequent use
- Tree rocking at its base with rootplate visibly lifting
- Tree uprooted but held up by another tree or building (hung-up)
- Large branch broken off and hanging from the tree
- Fallen tree or branches blocking a road, footpath, or access to property
- Tree or branches fallen on to house or car

4.12.5 Situations Regarded as Non-Emergency

- Dying - few leaves in summer or dieback in the crown
- Bark is loose and falling off
- Expansion/growth cracks in the trunk or large branches
- Smaller branches falling from the tree

4.13 Remedial Tree Works - Trees can usually be made safe via pruning or felling. Stirling Council will employ the most cost effective approach. For certain high value trees the Council will consider other options to reduce risk to an acceptable level including options to reduce the likelihood of the tree failing or the likelihood of people being close to, in or around the tree i.e. moving the “target”. For example, a bench situated directly under a suspect tree can be moved to a location outwith the trees fall zone, paths can be re-routed away from the tree.

5.0 Storm Action Plan –

5.1.1 Emergency Response Checklist (Appendix I)

The Emergency Response Checklist identifies “Storm Co-ordinator(s)” and teams covering the various services with allocated lead officer or supervisor per team and will be the lead document

during or after an adverse weather event. **Emergency Response work priority timescales differ** to timescales identified for normal running of tree works arising from planned inspections.

5.1.2 Emergency Response Log (Appendix J)

Both Land Services and the Roads service will be aware of forecasted extreme weather events and will plan accordingly e.g. ensuring adequate trained personnel and serviced chainsaws are available. The forecast will be notified to the contact centre who will complete the required information as stated in the **Emergency Response Log** in response to public enquiries and/or notification of storm damaged trees. The log identifies emergency response work priority timescales.

5.2 Notification of Dangerous Trees and the Storm Co-ordinator – reports will come in from members of the public via LAGAN and telephone as to blown trees or trees perceived to be dangerous and these will be directed to the appointed “Storm Co-ordinator” who will make further enquiries if necessary and prioritise and record each report on the Emergency Response Log. Work will be distributed accordingly to the relevant teams.

5.3 Out of Hours Emergencies – The Roads Service are responsible for 24hr emergency and Out of Hours call outs. However Land Services teams will ensure fully operational and adequate amount of chainsaws are made available during working hours in case assistance is required to unblock important access points or to deal with dangerous trees as a result of adverse weather. The Emergency Response Log should be copied to responsible person in roads out of hours. The Area split and responsible Roads staff are identified at **Appendix K**.

6.0 Incident Management and Reporting – any incidents including damage to property or persons involving a falling branch or tree should be logged via Stirling Councils Accident reporting procedures. As much detail as possible should be provided including accurate date, time of incident people involved, damage sustained and contact details. **On no account should material from the tree be removed from the scene** until photographs have been taken and catalogued accordingly. The tree parts should then be removed to a secure council location. The importance of managing incidents cannot be overstated when dealing with potential litigation (personal communication²).

7.0 Measuring Performance: - The following local indicators have been identified to measure the performance of Stirling Council's Tree Risk Operational Management Strategy (STORMS 2014), this will be subject to review once baseline data has been built up;

- Percentage of work on council owned trees in the emergency and urgent category (target annual reduction).
- Percentage of planned work undertaken on time (target annual increase).
- Number of incidents recorded in the failure log each year (target annual decrease).

8.0 Annual Review of the Tree Risk Strategy - is necessary as the tree stock grows and changes or as new building developments take place e.g. via the planning department.

9.0 The Land Services Budget: - The budget available for undertaking tree work will be subject to regular review in the light of developing priorities. A dedicated tree management budget is considered essential to drive the tree risk management programme forward.

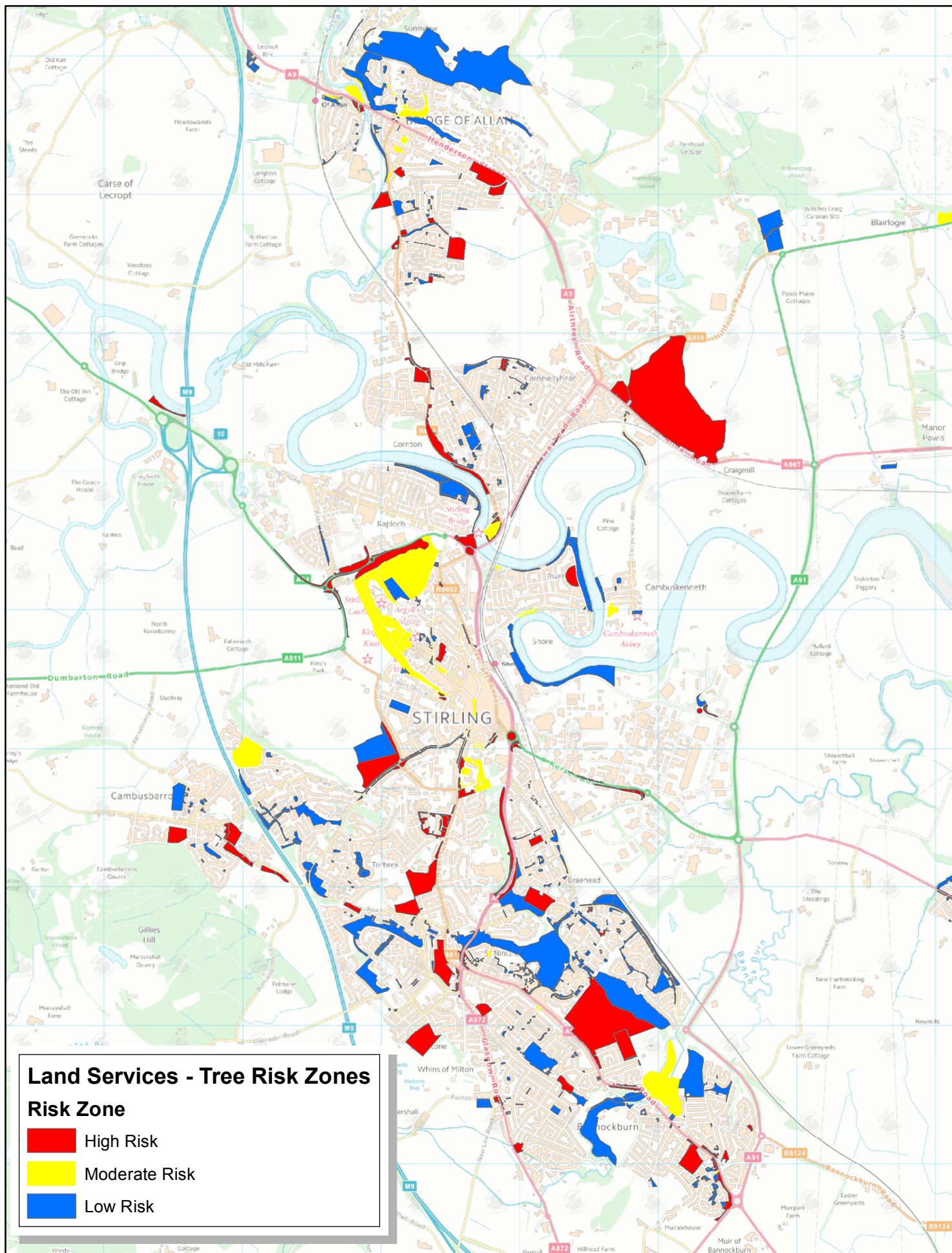
10.0 Safe Robust Tree Population - Stirling Council will promote best working practices at every opportunity, both within council services and to external working partners e.g. developers and statutory undertakers. The council must make better use of the statutory powers and industry standard guidelines available to them to ensure Stirling's important tree asset is not needlessly lost or irreversibly damaged and made unsafe in any way.

11.0 Summary of Tree Risk Management and the Inspection Process using the CONFIRM asset management system;

1. *"Around **half** of all fatalities due to falling trees or branches occur in **public spaces**, such as **a park or beside roads**." (HSE, 2013)*
2. **Inspections will be prioritised** via the HIGH risk zones identified on the GIS mapping system (Appendix A). The HIGH risk zones can be prioritised from urban settlements with the highest population densities e.g. Bannockburn and Whins of Milton (**Appendix 1**) and will **focus on public open spaces - parks, street trees and roadside trees**.
3. **Proactive and routine tree inspections** should be programmed at appropriate times of the year, alternating between "leaf on and leaf off" appropriately trained and competent individuals e.g. minimum requirement that of LANTRA Basic Tree Inspector (**Appendix F**).

4. The inspector will record the re-inspection frequency intervals against each tree. An inspection may contain different inspection frequencies within one risk zone or location – the **most frequent re-inspection interval** should be selected.
5. A uniform approach to tree inspections will be adopted by Stirling Council. This aims to clearly identify the level of inspection required to be carried out by designated competent persons as instructed by the council.
6. **Inspections** carried out by external consultants, who have the appropriate level of skills and expertise, will be given a clear brief which will identify the scope of work required, the area to be inspected and the level of inspection required. This may be at Level 1 “walking through” large populations of trees progressing to a Level 2 where a significant or obvious defect is identified.
7. If following an inspection carried out by the Basic Tree Inspector a further investigation is required to specify remedial works within an appropriate work priority response time, this will be at Level 2 or Level 3 inspection (Appendix E) and will be carried out by a fully qualified experienced individual e.g. **Professional Tree Inspector, Arboricultural Technician/Consultant**. A Level 3 inspection could include use of a non-invasive decay detection technology e.g. Picus tomography to determine the extent of decay in a high (amenity) value tree and a skilled diagnostic technician is required to interpret results. Determination of a risk rating to aid decision making may be made at this level of inspection.
8. Only **trees requiring work or re-inspection** will be tagged with a numbered metal disc or equivalent and these will be mapped on the council GIS mapping software via CONFIRM.
9. A **risk rating** may be determined guided by the ISA risk assessment method (**Appendix C**) for individual trees particularly where there is a significant veteran tree or tree of local importance exhibiting significant structural defects within striking distance of a “target” or a where a member of the public has expressed particular concern over a specific tree in relation to their own property.
10. Where a **public enquiry** has been logged in **LAGAN** regarding a tree issue and an inspection is agreed a Basic Tree Inspector will attend and record information required as shown at Appendix G. If further investigation i.e. Level 2 or Level 3 inspection is required a Professional Tree Inspector and/or skilled diagnostic technician will attend.
11. CONFIRM will record remedial tree works specified (to meet BS3998:2010) as part of the inspection process and assign **planned work programmes** per the work priority timescale recorded against a particular tree or group of trees (**Appendix D**).

12. CONFIRM will record remedial tree works specified (to meet BS3998:2010) as part of the inspection process and assign **planned work programmes** per the work priority timescale recorded against a particular tree or group of trees (**Appendix D**).
13. **Every inspection will be recorded** via the CONFIRM asset management system. Until this is in place inspection records must be manually transferred into the “**Master inspection record and Failure log**” filed in the Land Services Tree Inspections folder.
14. **Storm Action Plan** – Different procedures and work response times apply and the Emergency Response Checklist (**Appendix I**) and the Emergency Response Log (**Appendix J**) should be implemented and provisions put in place without delay when adverse weather is forecast.
15. Senior management should underpin the importance of implementing **planned routine inspections** by staff with the relevant training (**Appendix F**) and support this through the provision of suitable data collection hardware and refreshment of training where required.
16. **Incident management and reporting** – tree failures causing harm to property and/or person should be reported via Stirling Council’s Accident reporting and tree material photographed and catalogued/stored as appropriate. No material should be removed from the scene of the incident until all relevant information has been recorded.
17. **Annual Review** should be carried out once STORMS has been implemented to assess if the strategy works within the available resources and if further developments/improvements can be made through an increased understanding of the inspection process e.g. appropriate risk zones, work priority response times.
18. **Location Centre Relevant GIS layers;**
 - Land Services – Open space trees (an inventory of all council owned trees of which the corresponding data base requires updating and checking as inspections progress)
 - Land Services – Tree risk zones
 - Land Services – Woodland compartments
19. **Appoint responsible person** to administer inspections and control subsequent data, update GIS layer and to whom inspectors report to.
20. **Key message – is the tree hazardous, is there a risk, is risk of harm foreseeable, if so has action been taken to reduce the risk arising from a foreseeable tree failure?**



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Scale : 1:35,286

Date : 08.07.2015



Appendix A: Risk Zone Map (Stirling)



Risk Zone Categories	Colour Codes	Examples
High Risk	Red	<p>To be inspected within 1 or 2 years¹</p> <ol style="list-style-type: none"> 1. Schools (high usage areas)² 2. Playgrounds and play areas 3. Arterial road traffic routes and pedestrian pathways (A & B roads, motorways)³ 4. Public parks (high use) 5. Cemeteries (high use areas eg Top of the Town) 6. Emergency facilities i.e. Hospitals, fire and ambulance stations. 7. Council trees near Railway lines 8. Top Priority Trees (TPT) (in Mod/Low risk zones) Street trees, Heritage/Veteran trees
Moderate Risk	Yellow	<p>To be surveyed within 3 years¹</p> <ol style="list-style-type: none"> 1. Shopping centres 2. Cemeteries (moderate use areas) 3. Bus routes 4. Public car parks 5. Schools (low use areas)⁵ 6. Public buildings and community centres 7. Preferred emergency access routes⁴ 8. Work depots
Low Risk	Blue	<p>To be surveyed within 5 years¹</p> <ol style="list-style-type: none"> 1. Secondary roads and footpaths³ 2. Cemeteries (low use areas) 3. Residential car parks 4. Public Parks (low use areas) 5. Woodland boundaries and footpaths 6. Allotments 7. Low use roads³ 8. Residential/Council housing gardens and cutways 9. Other open spaces (low use)

Notes to Table 1:

1. A Basic Tree Inspection (Level 1) will be carried out by a qualified LANTRA Basic Tree Inspector who will identify trees with **obvious defects** (Appendix G) specify works required within the work priority response times (Appendix D). If further investigation is required to specify remedial works this will be carried out by LANTRA Professional Tree Inspector (Level 2) who may recommend an advanced inspection using a specialist technique (Level 3) in the case of a high amenity tree to be carried out by a fully qualified experienced individual e.g. Professional Tree Inspector, Arboricultural Technician/Consultant (Appendix E)
2. School playgrounds, congregation areas, entrances/exits and outdoor classrooms.
3. Based on the Department for Transport (DfT) road classification scheme and perceived public usage.
4. As defined by Stirling Council's Emergency Service.
5. Other school areas outside those defined in item 2.

APPENDIX C TREE RISK RATING MATRICES

Table 2. The matrix used to estimate the likelihood of a tree failure impacting a specified target

Likelihood of Failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Table 3. Risk rating matrix showing the level of risk as the combination of likelihood of a tree failing and impacting a specified target, and severity of the associated consequences.

Likelihood of Failure and Impact	Consequences			
	Negligible	Minor	Significant	Severe
<i>Very likely</i>	Low	Moderate	High	Extreme
<i>Likely</i>	Low	Moderate	High	High
<i>Somewhat likely</i>	Low	Low	Moderate	Moderate
<i>Unlikely</i>	Low	Low	Low	Low

Source: (ISA) Tree Risk Assessment Guide Best Management Practices

APPENDIX D

STIRLING COUNCIL WORK PRIORITY AND RESPONSE TIMES

Proposed Funding	Category	Detail	Priority Response Time
Land Services Budget	Emergency	Response to trees that are confirmed as imminently dangerous. Area cordoned off until works complete.	2-24 hours maximum
	Urgent Work	Response to trees that are perceived to be dangerous but where work needs to be undertaken at a safe time. Area temporarily cordoned off if deemed necessary.	2 weeks
	Very High	Works on potentially hazardous trees identified through tree inspections.	Works to be completed within 1 month of inspection
	High	Works on potentially hazardous trees identified through tree inspections.	Works to be completed within 3 months of inspection
	Moderate	Works to abate or remove actual or potential nuisance caused by council owned trees eg obscured road signs, height clearance vehicles, trees close to walls/fences in danger of causing physical structural damage	Works to be completed within 6 months of inspection
	Low	‘Good neighbour’ issues e.g. reduce encroachment from council owned trees where damage to buildings highly likely	Works to be completed within 12 months of inspection
*Additional Funding Sources	Recharge	Housing/Cemeteries clients (Service Level Agreements) <i>Ad hoc</i> projects	As and when required
	Private Emergency	Emergency response to deal with hazardous private trees blocking or threatening highways	24 hours maximum
	Private Planned	Agreed works to deal with hazardous trees e.g. on Council leased land	As and when required

*Requires further Investigation

APPENDIX E

INSPECTION LEVELS

Level 1 Basic Inspection

Identify the location and risk zone

Assess the tree(s) of concern as instructed via the scope of works identified

which may include walk through or driveby where there must be one driver and one inspector!

Plot trees requiring works or those forming inventory records

Record obvious defects

Record work priority response time and/or

- Identify trees needing a higher level of assessment (Level 2) and/or prompt action
- Submit completed Level 1 tree inspection schedule.

Tag trees requiring works.

Level 2: Professional Inspection

Identify the location and risk zone

- Locate and identify the tree or trees to be assessed.
- Determine the targets and target zone for the tree or branches of concern.
- Review site history, conditions, and species failure profile.
- Assess potential load on the tree and its parts.
- Assess general tree health.
- Inspect tree visually using binoculars, mallet, probes, or shovels as specified in the scope of work.
- Record observations of site conditions, defects, and outward signs of possible internal defects and response growth.
- If necessary, recommend an advanced assessment (Level 3).
- If appropriate determine a risk rating given the tree, its location and the likelihood and consequences of failure.
- Prescribe tree work recommendations to BS3998:2010 to reduce or mitigate the risk.
- Develop and submit the report/Level 2 tree inspection schedule including, where appropriate, advice on frequency of re-inspection.

Level 3: Advanced Inspection

There are many techniques that can be considered for advanced risk

assessment.** Some situations may be assessed with several techniques.

Advanced assessment techniques may include:

<ul style="list-style-type: none"> • Aerial inspection and evaluation of structural defects in branches <ul style="list-style-type: none"> * visual inspection * decay testing * load testing • Detailed target analysis <ul style="list-style-type: none"> * property value * use and occupancy statistics * potential disruption of activities • Detailed site evaluation <ul style="list-style-type: none"> * history evaluation * soil profile inspection to determine root depth * soil mineral and structural testing • Decay testing <ul style="list-style-type: none"> * increment boring * drilling with small-diameter bit * resistance-recording drilling * single path sonic (stress) wave * sonic tomography * electrical impedance tomography * radiation (radar, x-ray, and gamma ray) 	<ul style="list-style-type: none"> • Health evaluation <ul style="list-style-type: none"> * tree ring analysis (in temperate trees) * shoot length measurement * detailed health/vigour analysis * starch assessment • Root Inspection and evaluation <ul style="list-style-type: none"> *Root collar and root collar excavation *Root decay evaluation *Ground penetrating radar • Storm/wind load analysis <ul style="list-style-type: none"> *Detailed assessment of tree exposure and protection *Computer based estimations according to engineering standards *Wind reaction monitoring over a defined interval • Measuring and assessing the change in trunk lean <ul style="list-style-type: none"> *Load testing *Hand pull *Measured static pull *Measured tree dynamics
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**Inclusion of specific techniques in this list should not be considered an endorsement of the use of that technique

Source: Based on inspection levels criteria given in (ISA) Tree Risk Assessment Guide BMP

General description for each level:

Level 1: Basic inspection (carried out by LANTRA Basic or Professional Tree Inspector)

The scope of work must be identified i.e. a walk-over survey identifying obvious visual defects, for example, dead trees, large cavity openings, large dead/broken branches, fungal fruiting bodies, large branch/trunk cracks or leaning trees. Data collection may include stem diameter, height and use of sounding hammer. Or in the case of street trees, walking all around the tree looking for obvious defects.

This inspection is the most productive use of resources for assessing large tree populations

Level 2: Professional inspection (carried out by minimum LANTRA Professional Tree Inspector)

This is the standard Visual Tree Assessment (VTA) performed by Professional Tree Inspectors. The inspector walks completely around the tree observing the root-plate, woody/butress roots, main trunk and scaffold branches. It also entails looking at the tree from some distance away to consider site surroundings. Equipment that may be used for a Level 2 inspection includes: diameter tape, clinometer, sounding hammer, binoculars, camera, probe, trowel and compass. This inspection may culminate in an overall risk rating for the tree(s)

Level 3: Advanced (Professional Tree Inspector trained in evaluation and use of specialist equipment)

Provides detailed information to decide whether a tree is retained or removed.

These assessments can include: climbing inspections, root collar excavation, micro-drilling, resistograph drilling or sonic tomography.

n.b. Trees requiring works and/or further inspection must be tagged and plotted on map.

APPENDIX F
TREE INSPECTION TRAINING RECORD

Participants	Responsibility	Service Area	LANTRAB TI	LANTRA BTI	LANTRA BTI	BTIR	LANTRA PTI	PTIR
Donna Mills	Projects	Housing & Environment		31.07.14				
James Aikman	Play Maintenance	Housing & Environment		31.07.14			23.09.15	
Katrina Smith	Bridges & Flooding	Housing & Environment			30.09.14			
Elwyn Thomas	Bridges & Flooding	Housing & Environment		31.07.14				
Scott Mason	Fisheries	Housing & Environment		31.07.14				
David Maley	Roads	Housing & Environment		31.07.14				
Tam Rennie	Cemeteries	Housing & Environment		31.07.14				
Davie Rae	Play maintenance	Housing & Environment			30.09.14			
Roddy	Play maintenance	Housing & Environment			30.09.14			
Brian	Play maintenance	Housing & Environment			30.09.14			
Ryan Binnie	Fisheries	Housing & Environment			30.09.14			
Claire Bird	Ranger Service	Housing & Environment	19.01.11			24.10.14	23.09.15	
Colin Fridge	Fisheries	Housing & Environment	19.01.11			24.10.14		
Jennifer Davidson	Ranger Service	Housing & Environment	19.01.11			24.10.14	23.09.15	
William Inglis	Grounds Maintenance	Housing & Environment	22.12.10			24.10.14		
Derek Leitch	Grounds Maintenance	Housing & Environment	22.12.10			24.10.14		
Steven Robertson	Grounds Maintenance	Housing & Environment	22.12.10			24.10.14		
Robert Duguid	Grounds Maintenance	Housing & Environment	22.12.10					
Ewan Watson	Grounds Maintenance	Housing & Environment	22.12.10			24.10.14		
Paul Allan	Play Maintenance	Housing & Environment			07.05.15	24.10.14	23.09.15	
Jack Breslin	Tree & Woodlands	Housing & Environment				24.10.14		
Guy Harewood	Biodiversity Officer	Housing & Environment	19.01.11					
David Jones	Team Leader	Housing & Environment	19.01.11					
Fiona Melville	Tree & Woodlands	Housing & Environment					23.10.07/ 23.09.15	03.09.14
Jack Breslin	Trees & Woodlands	Housing & Environment			07/05/15			
Robert Duguid	Grounds Maintenance	Housing & Environment			07/05/15			
Stephen Robertson	Grounds Maintenance	Housing & Environment			07/05/15			
Lindsey McDonald	Grounds Maintenance	Housing & Environment			07/05/15			
Dougie Wylie	Grass	Housing & Environment			07/05/15			
Ingrid Withington	Tree Officer Planning	Planning			07/05/15			
BTI Lantra Basic Tree Inspection one day delivered by www.informedtreeservices.co.uk								
BTIR Basic Tree Inspection Refresher delivered by www.informedtreeservices.co.uk								
PTI Lantra Professional Tree Inspection 3 day delivered by SAC 2007 and informed tree services ltd 2015								
PTIR Professional Tree Inspection Refresher one day delivered by the Arboricultural Association								

APPENDIX G1

LEVEL 1 BASIC TREE INSPECTION SCHEDULE

Date:	Weather:	Level of Inspection: 1
Location:	Risk zone:	Inspector:

[illegible]

APPENDIX G2

LEVEL 2 PROFESSIONAL TREE INSPECTION SCHEDULE

[illegible]

Stratification of Council Area by Settlement and Responsible Persons

APPENDIX I

STORM ACTION PLAN - EMERGENCY RESPONSE CHECKLIST

STORM ACTION PLAN

EMERGENCY RESPONSE CHECKLIST

Appoint Storm Coordinator (s) maximum of two.
Open Emergency Response Log

Alert Admin and Contact Centre Staff where to direct public enquiries and reports of tree incidents

Allocate lead officer/supervisor to each team:

Team 1 Play Maintenance
Team 2 Grounds Wallace
Team 3 Grounds Bruce
Team 4 Rangers & Trees & Woodlands Asst
Team 5 Cemeteries
Team 6 Roads
Team 7 Housing
Tree Contractors if appointed

Reported trees and enquiries - obtain as full a description of tree, condition and target, location
Direct All reports & enquiries to Storm Coordinator and Enter in Emergency Response Log
Prioritise reports and distribute to SC Teams and Tree Contractors if appointed

Generic Risk Assessment required for employees attending storm damaged tree incidents

Kit List

ADVERSE WEATHER FORECAST

OUT OF HOURS

Priority Timescales; Work must be carried out safely and not put operator in unnecessary danger.

Table 1 Adverse weather/storm action plan response times		
Priority	Response time	Description
Emergency	2 hours	Trees or hanging branches which are hung up, windblown, in imminent danger of collapse and injuring person and/ or property, blocking a public road, school access/ property or hospital access/ egress.
Urgent	24 hours	Trees which may collapse and injure persons and/or property, blocking frequently used public footpath
High	48 hours	Damaged trees or hanging branches unlikely to cause harm to people or property.
Medium	7 days	Safe fallen trees and branches causing a nuisance
Low	14 days	Safe fallen trees and branches causing a nuisance

Key Docs:

Storm Action Plan - Emergency Response Log
Storm Action Plan - Emergency Response Checklist
Storm Action Plan - Contact Numbers

INFORMATION REQUIRED

Names time on and Time off (HANDOVER)
Complete each column
Send copy of Emergency Response Log and ask to collect this information as far as possible from public before submitting to storm co-ordinator - obtain as full a description of tree, condition and target

Names, time on and off (HANDOVER)

Each team feeds back list of trees via lead officer/supervisor and storm coordinator agrees work priority timescales for each incident - teams to obtain as full a description of tree, condition and target, location

Risk assessment pro forma - Paul Allan

Fully Operational Chainsaws and spares, Roads operators on standby, PPE (Hard hats for all investigating storm damage tree reports)

Be aware and make preparations ie forecast distributed to CONTACT CENTRE, TEAM LEADERS, LEAD OFFICERS/SUPERVISORS, TEAMS 1 TO 7 and Roads Chainsaw users on standby

Emergency Response Log to be copied to responsible person in Roads out of hours

STORM ACTION PLAN - EMERGENCY RESPONSE LOG

[illegible]

Priority	Response time	Description
Emergency	2 hours	Trees or hanging branches which are hung up, windblown, in imminent danger of collapse and injuring person and/ or property, blocking a public road, school access/ property or hospital access/ egress.
Urgent	24 hours	Trees which may collapse and injure persons and/or property, blocking frequently used public footpath
High	48 hours	Damaged trees or hanging branches unlikely to cause harm to people or property.
Medium	7 days	Safe fallen trees and branches causing a nuisance
Low	14 days	Safe fallen trees and branches causing a nuisance

APPENDIX K

Roads Area Split and Responsible Officers

Area 1	Area 2	Area 3
Aberfoyle	Arnprior	Balquhidderock
Argaty	Auchenbowie	Bannockburn
Ashfield	Balfron	Blairlogie
Balquhidder	Balmaha	Braehead
Blairdrummond	Blanefield	Bridge of Allan
Brig `o` Turk	Boquhan	Broomridge
Callander	Borestone	Cambuskenneth
Crainlarich	Buchanan Smithy	Causewayhead
Cromlix	Buchylvie	City Centre
Dalmary	Cambusbarron	Cornton
Deanston	Carron Valley	Cowie
Doune	Carronbridge	Fallin
Dunblane	Chartershall	Forthbank
Gartmore	Croftamie	Hillpark
Killin	Cultenhove	Plean
Kinbuck	Drymen	Raploch
Lochearnhead	Dumgoyne	Riverside
Port of Menteith	Fintry	Sherrifmuir – from B of A to Sheriffmuir Inn
Sherrifmuir – from Dunblane to Sheriffmuir Inn	Gargunnoch	Springkerse
Strathyre	Gartness	St Ninians - East of & incl. A872 Glasgow Road
Thornhill	Killearn	Top of the Town
Tyndrum	Kings Park	Throsk
	Kippen	Whins of Milton
	Laurelhill/ Torbrex	
	Milton of Buchanan	
	New Line Road	
	Rowardennan	
	St Ninians - West of the A872	
	Strathblane	
Area 1	Area 2	Area 3
Roads Area Officer - Gordon MacLachlan	Roads Area Officer - David Maley	Roads Area Officer - Jim Hamilton
Roads Area Inspector - Gus McCormack	Roads Area Inspector - Sandy McMeechan	Roads Area Inspector - Alan Skene

REGULATION 28: REPORT TO PREVENT FUTURE DEATHS

*NOTE: This form is to be used **after** an inquest.*

	REGULATION 28 REPORT TO PREVENT FUTURE DEATHS THIS REPORT IS BEING SENT TO: 1. Bracknell Forest Borough Council 2. Chartered Institution of Highways and Transportation 3. [REDACTED]
1	CORONER I am Peter J. Bedford, Senior Coroner, for the coroner area of Berkshire.
2	CORONER'S LEGAL POWERS I make this report under paragraph 7, Schedule 5, of the Coroners and Justice Act 2009 and regulations 28 and 29 of the Coroners (Investigations) Regulations 2013.
3	INVESTIGATION and INQUEST On 9 th October 2012 I commenced an investigation into the death of Michael Arthur Warren. The investigation concluded at the end of the inquest on 10 th July 2014. The conclusion of the inquest was a narrative as attached.
4	CIRCUMSTANCES OF THE DEATH Michael Arthur Warren died from serious head injuries suffered when the car he was driving was struck on its roof by the large branch of a mature oak tree that unexpectedly fell without warning as he drove beneath it on 5 th October 2012.
5	<u>CORONER'S CONCERNS</u> During the course of the inquest the evidence revealed matters giving rise to concern. In my opinion there is a risk that future deaths will occur unless action is taken. In the circumstances it is my statutory duty to report to you. The MATTERS OF CONCERN are as follows. – (1) The evidence at the Inquest revealed that Bracknell Forest Borough Council employ Highways Inspectors to carry out driven and walked inspections in order to attempt to identify any potential hazards that might impact adversely on road users. (2) The Highway Inspectors were expected to identify a range of potential problems including potholes in the road, damaged or obscured signage and potential hazards from trees abutting the highway which were often of considerable height. There was little by way of guidance given to Highways Inspectors who had developed their own system of drive-by investigations conducted at a speed rarely less than thirty miles per hour. (3) The evidence highlighted the limited nature of training provided to Highway Inspectors in identifying potential hazards from trees. The two Inspectors who conducted a drive-by survey two days before the branch fell and killed Mr Warren and who had noted nothing of concern, had not completed any form of tree training since a two day course some seven years earlier. Another Highway Inspector who gave evidence at the Inquest, had never attended a formal training course with regard to tree hazards. (4) There is therefore a need for appropriate guidelines to be provided by Bracknell

	<p>Forest Council to Highway Inspectors to ensure that they are properly trained in tree issues; that they have an appropriate system of work that ensures that they drive at a speed appropriate to maximise the chances of identifying tree hazards and that there should be a series of inspections which are limited to only the inspection of trees.</p> <p>(5) The evidence also revealed that there was very little by way of clear, detailed guidance available to Local Authorities as regards the appropriate systems of highway inspection of trees abutting the highway. There is a potential need for clear direction from a suitably qualified source to assist Local Authorities in this crucial role.</p> <p>(6) The owner of the land on which the relevant oak tree stood lived abroad and had no arrangements for professional review of the trees on his property, in particular those that were close to the highway and therefore a potential hazard to road users. It was of concern that the lack of active management of the owner's land continued some two and a half years after Mr Warren's death.</p>
6	<p>ACTION SHOULD BE TAKEN</p> <p>In my opinion action should be taken to prevent future deaths and I believe you and/or your organisation have the power to take such action.</p>
7	<p>YOUR RESPONSE</p> <p>You are under a duty to respond to this report within 56 days of the date of this report, namely by Friday 12th September 2014. I, the Coroner, may extend the period.</p> <p>Your response must contain details of action taken or proposed to be taken, setting out the timetable for action. Otherwise you must explain why no action is proposed.</p>
8	<p>COPIES and PUBLICATION</p> <p>I have sent a copy of my report to the Chief Coroner and to the following Interested Persons - Bracknell Forest Borough Council, The Chartered Institution of Highways and Transportation and Mr [REDACTED]</p> <p>I am also under a duty to send the Chief Coroner a copy of your response.</p> <p>The Chief Coroner may publish either or both in a complete or redacted or summary form. He may send a copy of this report to any person who he believes may find it useful or of interest. You may make representations to me, the coroner, at the time of your response, about the release or the publication of your response by the Chief Coroner.</p>
9	<p>17th July 2014</p> <p>Senior Coroner for Berkshire</p>

Condition category

GOOD - Full healthy canopy. Free from major cavities, wounds, pests or diseases.
FAIR - Slightly reduced leaf cover, minor deadwood or isolated major deadwood. Early stages of decay/disease. Structural faults.
POOR - Overall sparse canopy or extensive deadwood. Well established decay organisms. Cavities and or large wounds. Structural features prone to failure.
VERY POOR - Large areas of dead crown. Advanced decay. Structurally unsound

Work Priority Timescales

The recommendations for tree works shown in the tree survey schedule are given a timescale within which these should be completed as follows;

- Emergency - response to trees confirmed as imminently dangerous to be completed within min 2hrs and max 24hrs of inspection date
- Urgent - response to trees perceived to be dangerous but where work needs to be undertaken at a safe time to be completed within 2 weeks of inspection date
- Very High - works on potentially hazardous trees to be completed within 1 month of inspection date
- High - works on potentially hazardous trees to be completed within 3 months of inspection date
- Moderate - works to abate nuisance eg trees close to walls fences, obscuring signs, causing structural damage via growth etc to be completed within 6 months
- Low - good neighbour issues; eg reducing encroachment from council owned trees where damage to buildings highly likely to be completed within 12 months

Re-inspection frequency - Ensuring inspection intervals alternate between leaf on and leaf off

Annually or every 2yrs in High Risk Zone or where trees in medium or low risk zones regarded as a higher risk rating overall
3 yrs in medium risk zones
5 years in low risk zone
Top Priority Trees (TPTs) may warrant a more frequent inspection interval i.e. trees perceived as a HIGH risk located in a LOW risk zone could have inspection frequencies ranging between 6, 12 and 18 months.

RPA - Root Protection Area

Area around base of tree where no development work, storage of materials etc to take place i.e. zone calculated at 12 times stem diameter

Recommended Action - NWR = No Work Required

Obvious Defects

Cavities in branch/stem/base
Damaged/impaired roots
Root failure/root plate lifting
Soil cracks/heave/soil grade change
Co-dominant stems
Compression Union
Crown dieback
Abnormal bulges/swelling
Significant Decay Fungi
Loose/dead bark/exudate
Hanging/Broken Branches
Cracks/splits in branches
Dead tree/leaning tree
Mechanical/trimmer damage

Habitats (identify if suspected during inspection process and investigate further/obtain advice)

Bat Potential - Yes/No
Bat Features - History, Rot/Woodpecker hole or other cavity, splits /cracks/loose bark/Dense ivy/epicormic growth,
Bat/Bird box, Other
Badgers - evidence of sett
Birds - nest, cavity in stem
Other

Age Class

Y Young (Y - up to one third of life expectancy)
EM Early Mature (EM - Less than 1/3 of expected life span)
M Mature - (M 1/3 to 2/3 expected life span)
LM Late Mature (LM - more than 2/3 expected life span)
V Veteran (V more than expected life span with crown retrenchment, overly large girth for the species etc