

**Report for the**  
**National Tree Safety Group**

**Prepared by**  
**Centre for Decision Analysis and Risk**  
**Management**  
**Middlesex University**

**David J. Ball**  
**Professor of Risk Management**

**January 2009**

## **Executive summary**

This report is one part of a work package commissioned by the National Tree Safety Group aimed at determining what would constitute a reasonable and appropriate inspection regime for trees in relation to public safety. This report deals with the issue of perceived risk and public concerns relating to tree safety, lest this might impinge upon the choice of that strategy.

The United Kingdom has developed a much respected rational framework for decision making known as the Tolerability of Risk framework or 'ToR.' During the past decade or so there has been a growing view that risk management decisions should additionally, where appropriate, reflect public concerns. Such concerns would fairly obviously arise in the context of issues like genetically-modified crops, the use of growth hormones in animal husbandry, or the handling of nuclear waste. The question here is whether public 'concerns' might also have a bearing on tree management. The HSE has said, for instance, that "...the low level of overall risk may not be perceived in this way by the public, particularly following an incident." True though this is, the issue is whether a decision maker in an *ex-ante*, as opposed to *ex-post*, position should be factoring in public concern into his/her decision making.

This report explores through a number of routes, based on government recommendations and academic research, the issue of public concern over the risk of injury posed by trees. The conclusion is that there is no evidence that the general injury risk posed by trees invokes any degree of widespread public concern. Rather, the risk presented by trees is seen as one of the ordinary, everyday risks of life.

The implication is that for duty holders responsible for trees and public safety there are no additional concern factors to be weighed in deciding what is a reasonable course of action.

### **Note**

Throughout this report the following definitions apply:

**Hazard** – an object or situation with a potential to cause harm

**Risk** – the probability, likelihood or chance that a specified outcome will occur

# The Public Perception of Risk

## 1. Introduction

This document is produced as the second element of the response to the contract placed in autumn 2008 by the National Tree Safety Group (NTSG) with the Centre for Decision Analysis and Risk Management (DARM) at Middlesex University. The background to the contract is the interest of landowners, the arboricultural industry and other professional bodies in the appropriate level of inspection and management which should be employed to control the risk to the public posed by falling or fallen trees.

It is well known within risk management circles that it is not simply the actual risk of some harm which troubles people and generates responses, but the perceived risk. Although perceived risk might *prima facie* be seen as an arcane abstraction from the real business of managing land and trees, it does have a tangible impact upon the behaviour of those numerous agencies, including the courts, the media and insurers, that in some way influence the tenor of tree risk management. The regulator itself, the Health and Safety Executive (HSE), has referred to the role of perception in its Sector Information Minute (SIM)<sup>1</sup> as follows:

“The risk, per tree, of causing fatality is of the order of one in 150 million for all trees in Britain or one in 10 million for those trees in, or adjacent to areas of public use. However the low level of overall risk may not be perceived in this way by the public, particularly following an incident.”

Investigations of perceived risk have been widely reported in the risk literature and this document summarises those aspects which could have a bearing on the management of trees. It also links this work to official positions on the appropriate role of perceived risk in risk management decision making.

## 2. The evolution of decision making

Some thirty or so years ago it was commonplace for decisions involving risk to be taken by technocrats on behalf of society and the public. However, in line with Churchill's maxim that “Scientists should be on tap, but not on top,”<sup>2</sup> and coupled with episodes of dissatisfaction over some science-driven policy decisions,<sup>3</sup> there has been a gradual shift in opinion in government and some academic circles over how decisions should be made. The consequence has been that practically all modern manuals on risk decision-making emphasise the need for adequate communication with stakeholders and the public, and the need to take account of public concerns.<sup>4</sup>

---

<sup>1</sup> Management of the risk from falling trees, HSE Sector Information Minute, SIM 01/2007/05.

<sup>2</sup> Quoted in Randolph S. Churchill, *Twenty-One Years* (1964), 127.

<sup>3</sup> Including nuclear power, the management of flood defences, railway safety, genetically-modified crops, and even the use of evidence-based decision making by the National Health Service.

<sup>4</sup> For example, The Cabinet Office Strategy Unit's ‘Risk: improving government's capability to handle risk and uncertainty,’ November 2002.

Consistent with this sentiment is the introduction by HM Treasury (HMT) in 2005 of 'The Orange Book,' a guide 'for developing and assessing proposals that affect the risk of fatalities, injury and other harms to the public.' This document supplements other fundamental Treasury guidance contained in its long-established 'Green Book' which sets out a general approach to carrying out options appraisal of all interventions.

The Green Book poses two fundamental questions of those who would introduce policies, programmes or projects. These are:

- Are there better ways to achieve this objective?
- Are there better uses for these resources?

Various tools are described for answering these questions, including notably the use of cost-benefit analysis (CBA). Of special significance here is that The Green Book is crystal clear that the 'wider social and environmental costs and benefits for which there is no market price also need to be brought into any assessment.' Thus, management decisions should encompass:

- Strategic issues
- Economic considerations (use of CBA is specifically mentioned)
- Affordability
- Achievability
- Regulatory impact (Regulatory Impact Assessment (RIA) is recommended as the preferred tool for assessing impacts in terms of costs, benefits and risks of any proposed intervention)
- Legislation
- Environmental impacts
- Rural issues
- Equality
- Health
- Health and safety

In considering the 'wider social and environmental costs and benefits,' The Green Book identifies a suite of techniques for placing monetary values on, for example, time, health benefits, and avoided injuries and fatalities, enabling these factors to be fully accounted for in the attendant CBA or RIA.

The new twist to this old tale which is brought by The Orange Book is its specificity – it expressly addresses risks to the public – and secondly its emphasis upon assessing public concern. It says that in addition to (conventional) risk assessment, the level of public concern should also be assessed. This is because public, non-expert or lay perceptions of risk can differ greatly to those of experts. This comes about because:

- they (the public) may have a different understanding of the nature and magnitude of the risk (and may have less information)
- they have different and diverse views about the acceptability of risks
- experts and the public may define risk differently

### 3. Background to ‘Concern assessment’

Ever since some failures to gain public acceptance of ‘technocratic’ decisions<sup>5</sup> based on scientific analysis (risk assessment) and the application of ‘rational’ decision tools such as Decision Analysis and CBA in relation to certain high-profile hazards, academics and policy researchers have sought to identify the reasons. The aim of tools such as risk assessment, and certainly CBA, is after all to provide the greatest benefit for the greatest number, consistent with an essentially utilitarian philosophy, and this has underpinned decision making as described in The Green Book, and as used in diverse sectors ranging from the NHS to the Environment Agency and the Maritime and Coastguard Agency. However, both utilitarianism, and risk assessment, have long had their critics<sup>6</sup> leading to an ongoing debate, the roots of which can be traced back to The Enlightenment, ancient Greece, and probably beyond.

Various theories have been put forward to explain the controversial nature of risk decisions. Work by the American psychologist Paul Slovic,<sup>7</sup> since replicated in other countries around the world, has shown irrefutably that the public are sensitive to certain qualitative dimensions of hazards besides the numerical level of the risk<sup>8</sup> associated with them. This contrasts with risk experts who tend to focus on the numerical magnitude of risk and nature of harm. These qualitative dimensions of interest to the public include things like degree of familiarity with the hazard, equity issues (e.g. who is exposed and who benefits), voluntariness of exposure *et cetera*. Thus, in the lay mind, hazards like genetically-modified crops, which are new and unfamiliar, would automatically be perceived as more risky than organic produce irrespective of the numerical risk, and those hazards which pose outcomes which are more feared, like cancer or CJD, would trump those which lead to broken limbs or indigestion.

Figure 1 shows the output of a typical study by Slovic et al. derived from a survey of public opinion about a large number of hazards (each hazard is represented by a dot in the Figure). The hazards which end up in the top right quadrant are those which are less known (high on the y-axis) and more dreaded (right end of the x-axis). Those in the bottom left quadrant are there because the public find them to be familiar and not dreaded. Further questioning has then typically revealed that the public wish there to be greater regulation of hazards which are on the right side of the diagram, particularly the upper right quadrant (as in Figure 2).

---

<sup>5</sup> A term used in some academic circles for this way of thinking is the ‘Rational Actor Paradigm,’ or RAP for short. ‘Rational’ here referring to the use of a strictly evidence-based approach to decisions.

<sup>6</sup> See for example K. Sexton ‘Socioeconomic and racial disparities in environmental health: is risk assessment part of the problem or part of the solution?’ *J Human and Ecological Risk assessment* (2000) 6(4): 561-574; or J. Adams ‘Risk,’ (1995) UCL Press, London; or D. J. Ball ‘Environmental health policy,’ (2006) Open University Press, chapter 11.

<sup>7</sup> For example, P. Slovic, ‘Risk perception,’ Earthscan (2000).

<sup>8</sup> ‘Risk’ is defined here as the probability of some specified harm occurring, e.g. the likelihood per year of being stung by a bee.

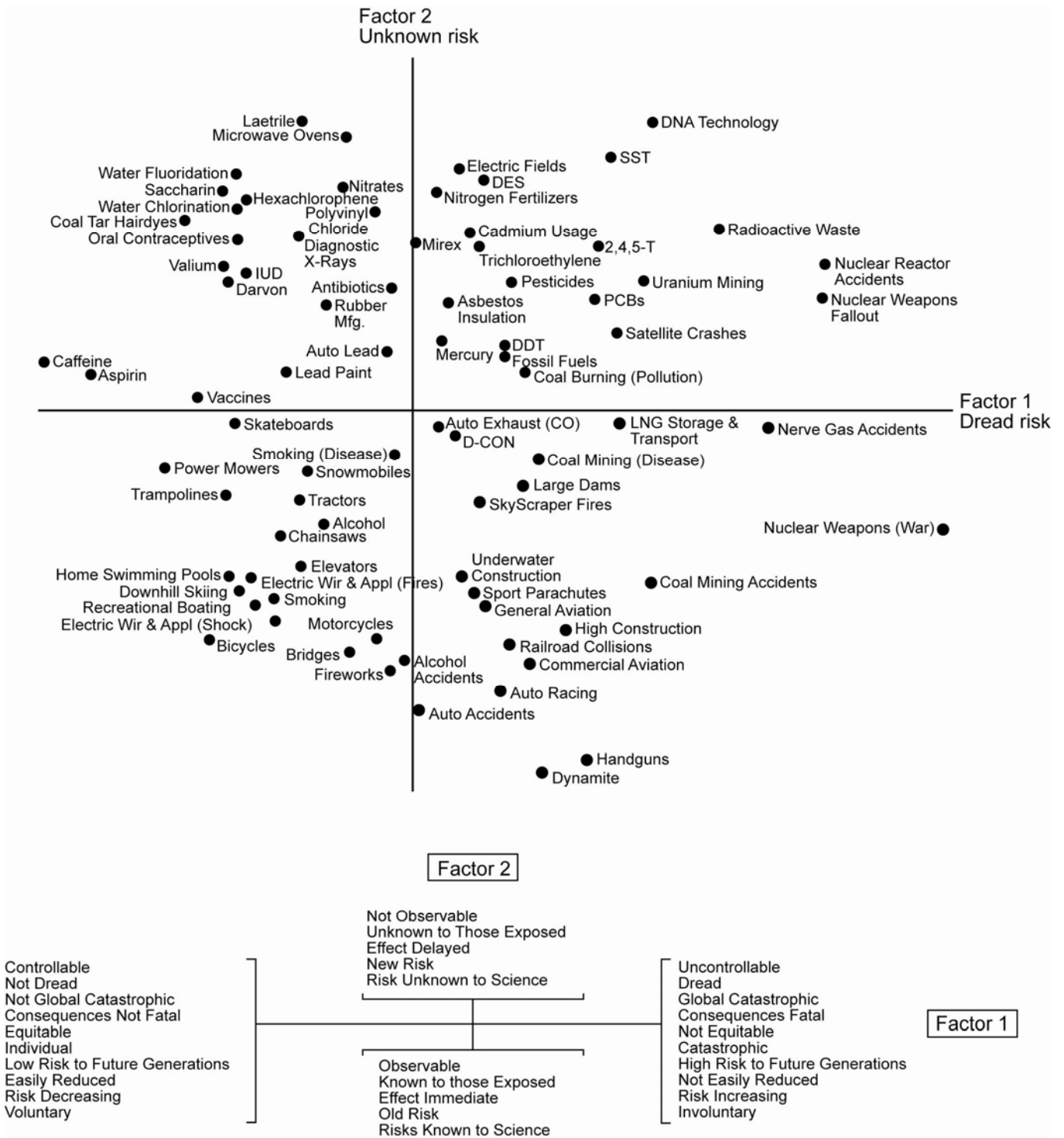


Figure 1: How the public perceive risk according to two composite dimensions ranging from 'not dreaded to dreaded' (x axis) and 'known to unknown' (y-axis). The dread and known-unknown axes are made up of the factors in the lower diagram. The hazards appearing in the top right quadrant are thus regarded as unknown and dreaded, whereas those in the bottom left are known and not dreaded. Reproduced from Slovic, P., Fischhoff, B., & Lichtenstein, S. (1985). Characterizing perceived risk. In R. W. Kates, C. Hohenemser & J. X. Kasperson (Eds.), *Perilous progress: Managing the hazards of technology* (pp. 91-125). Boulder, CO: Westview.

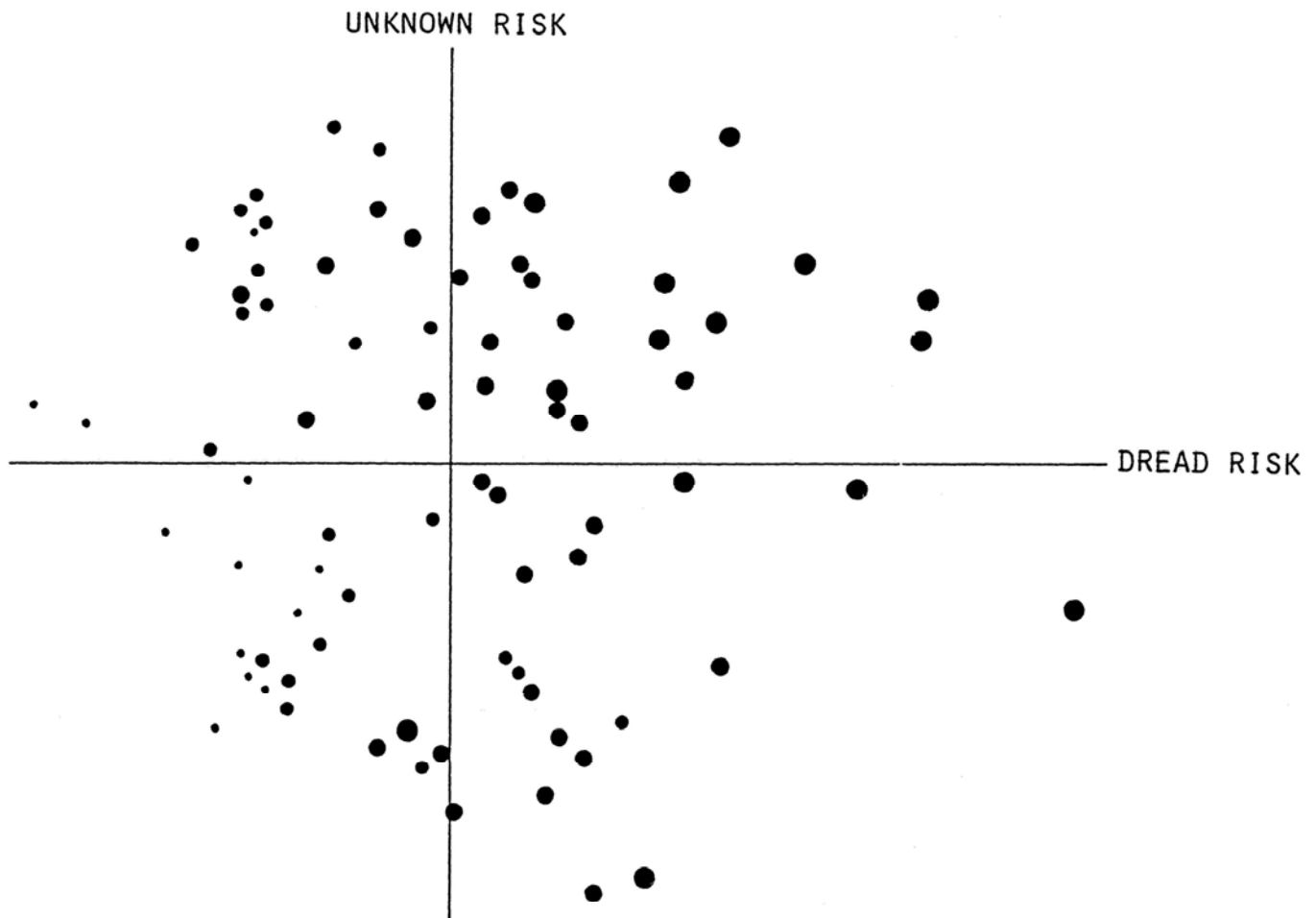


Figure 2: This diagram shows attitudes towards the hazards in Figure 1. The larger the point, the greater the desire for strict regulation to reduce risk. Hazards which are dreaded as seen as warranting greater control, particularly if they are also less known. Reproduced from Slovic, P., Fischhoff, B., & Lichtenstein, S. (1985), 'Characterizing perceived risk.' In R. W. Kates, C. Hohenemser, & J. X. Kasperson (Eds.), *Perilous progress: Technology as hazard* (pp. 91-123). Boulder, CO: Westview.

Based upon the psychometric model developed by Slovic and colleagues, HM Treasury's Orange Book distils out six characteristics as indicators of public concern. These are:

- familiarity and experience of the risk – novel hazards are generally of greater concern
- understanding of the cause-effect mechanism – this refers to the uncertain effects of some hazards e.g. mobile phone masts
- equity of consequences and associated benefits – e.g. some hazards such as nuclear power plant and hydroelectric dams provide benefits to people mainly far away while posing a risk to those nearby
- fear of consequences – if the harm in question is horrific or affects future generations it will give rise to concern e.g. CJD or ionising radiation

- control of the hazard – people are more concerned if they lack personal control over a hazard
- trust in risk management – in cases where there is no personal control, the amount of concern is affected by the degree of trust in those otherwise responsible for the hazard

The follow-up question to this would be, in the case of hazards which demonstrate heightened public concern because of their qualitative characteristics, what actions should the risk manager or duty holder take? This is a difficult issue. Generally, policy interventions are recommended when the modified Pareto rule is satisfied, that is:<sup>9</sup>

$$\text{Benefits of intervention} \geq \text{Cost of intervention}$$

As a footnote to this, when dealing with health and safety specifically, an additional factor, known as *gross disproportion*, may be relevant in the UK. The effect of this is to introduce a multiplier into the equation which favours interventions that reduce risks to health and safety unless their costs are *grossly disproportionate* to the benefit, the benefit being the greater safety achieved. The concept of gross disproportion, which originated in case law,<sup>10</sup> raises its own ethical issues and these will not be discussed here.

Whichever rule is followed, the question still remains as to what further actions should be contemplated if a hazard generates concern through its qualitative characteristics. One option would be to allocate more resources so that the risk can be further reduced, but the downside of this is that resources are always limited and so the transference of resources to something which is feared, though not particularly harmful in the objective sense, means that resources are not optimally allocated from the perspective of e.g. saving lives. In short, society will suffer more harm in the form of sick, injured and deceased people as a consequence. Although it is often said that decision makers should not let quantitative or partially-quantitative techniques and decision aids determine their decisions, it is also true that the further one deviates from the advice of a full quantitative assessment, the greater should be the justification.<sup>11</sup>

So what does The Orange Book recommend? Table 1 summarises HMT's advice, the nature of which depends on which of the six factors is giving rise to the concern. For the most part it can be seen that the approach suggested for handling concerns is via communication with the affected public as opposed to increased expenditure on hazard management. Thus, the traditional emphasis of The Green Book on obtaining value for money even in situations involving public risk is not greatly perturbed.

---

<sup>9</sup> For example, see House of Lords Select Committee on Economic Affairs (2006) Government policy on the management of risk, Vol. 1 para13, and the Environment Agency, 'Sustainable development – taking account of costs and benefits,' circa 2000.

<sup>10</sup> *Edwards v National Coal Board* (1949) 1 KB704, 1 AER743, 65TLR430CA.

<sup>11</sup> See for example The Orange Book pp 29-30.



<b>Cause of concern</b>	<b>Suggested remedies</b>
Unfamiliarity with the hazard	Indirect raising of awareness e.g. radio and TV broadcasts, leaflets, briefing of journalists
Poor understanding of the causal mechanism	If experts have a good understanding then the remedy is to communicate this to the public. If no-one understands then a more precautionary approach might be warranted, coupled with more research
Inequitable consequences	Find out who is most at risk and target the intervention accordingly
Fearful consequences	Where the level of fear of harm is at odds with the actual risk action may not be necessary to increase controls, but rather to provide reassurance
Lack of personal control	Allow people to self-regulate or give informed consent
Lack of trust in risk management	Public bodies need to consult and respond to concerns; demonstrate a sound approach to decision making; communicate the extent to which the public can realistically be expected to be protected

Table 1: Responses to public concerns (based on The Orange Book)

#### **4. Societal risk and societal concerns**

A further inducement to shift the balance of decision making in favour of increased risk control arises when either ‘societal risk’ or ‘societal concerns’ are invoked. Societal risk is a specialist term deployed in the risk field, and refers to those hazards which could potentially kill a large number of people in one accident.<sup>12</sup> The usual definition of a ‘large number’ in this situation is ten or more fatalities. Hazards of this kind include some railway accident scenarios and the major hazard industries such as offshore oil and gas and nuclear.

Societal concerns, on the other hand, have been defined by the HSE as:

“... the risks or threats from hazards which impact on society and which, if realised, could have adverse repercussions for the institutions responsible for putting in place the provisions and arrangements for protecting people, eg Parliament or the Government of the day. This type of concern is often associated with hazards which give rise to risks which, were they to materialise, could provoke a socio-political response eg risk of events causing widespread or large scale detriment or the occurrence of multiple fatalities in a single event. Typical examples relate to nuclear power generation, railway travel, or the

<sup>12</sup> Societal Risk Criteria – Possible Futures. P. J. Floyd and D. J. Ball, In: Foresight and Precaution, Cottam, Harvey, Pape and Tait (eds.), Balkema, Rotterdam (pubs.), pp 183-190, 2000. ISBN 90 5809 140 6.

genetic modification of organisms. Societal concerns due to the occurrence of multiple fatalities in a single event is known as societal risk. Societal risk is therefore a subset of societal concerns.”<sup>13</sup>

## 5. Discussion

### 5.1 Arboriculture, societal risk and societal concern

The HSE’s SIM, as mentioned above, refers to potential public concern following an incident. Certainly, it can be reliably predicted that if some member of the public were killed by a falling tree, then it would likely generate a passing story in the local, and occasionally national, media. It is well known that unusual events, such as tree-related fatalities, are more likely to be newsworthy than commonplace accidents even though the latter pose a far greater risk and cause much more harm overall.

This newsworthiness should not be taken, however, as implying that there is an enhanced statutory duty to control the hazard, or that it would be in the public interest to attempt to do so. There *might* be a stronger case for this were trees to invoke societal risk considerations, or even societal concerns, but there is no evidence that this is the situation. It is hard to imagine, though it is not totally inconceivable, that a tree could cause ten or more fatalities, or somehow be involved in some major disaster, but the probability of this is exceedingly small in most circumstances.

Likewise, trees are not known to invoke societal concerns as a result of the risk of harm that they pose. Indeed, research has shown that societal concerns frequently originate not from the public at all, as is often inferred, but as a result of the actions of other parties or vested interests.<sup>14</sup> In fact, there is far more evidence of a truly public societal concern in relation to a public desire for the retention and preservation of trees (e.g. Figure 3).



Figure 3: Typical example of public outrage over tree felling by local councils. “A row is raging in Norwich after the city council threatened to fell seven horse chestnut trees because of the risk posed by their conkers. The conkers are a danger to pedestrians, who could slip on the mulch they leave behind, according to the council. The golf-ball sized horse chestnuts could also come crashing down onto passing cars, while sticks thrown by children to dislodge them could cause serious head injuries, the council has warned.” (BBC News 14 June 2001)

<sup>13</sup> HSE Books (2001) ‘Reducing risk protecting people.’

<sup>14</sup> D J Ball and S Boehmer-Christiansen, Societal concerns and risk decisions, J Hazardous Materials 144 (1-2): 556-563, 2007.

Thus, there are many cases of local outrage recorded following the removal or threat of removal, sometimes on alleged health and safety grounds, of trees. This sense of outrage could increase as a result of the growing realisation that trees of significant stature are being lost, especially in urban areas, and that these same trees have many benefits, some long-recognised and some newly-recognised, such as contributing to cooler temperatures and thus offsetting the effects on health of climate change.<sup>15</sup>

As the House of Lords Select Committee on Economics has put it:<sup>16</sup>

“...the most important thing government can do is to ensure that its own policy decisions are soundly based on available evidence and not unduly influenced by transitory or exaggerated opinions, whether formed by the media or vested interests.”

## **5.2 Arboriculture, perceived risk and concern criteria**

The research by Paul Slovic and colleagues has identified those hazards which generate a greater concern as those lying on the right-hand side of Figure 1. That is, those which invoke some form of ‘dread,’ where dread is a composite term incorporating notions of terror, uncontrollability, global catastrophe, risk to unborn generations (as with nuclear radiation), increasing risk, a risk which is not easily controlled, and involuntariness. Dreaded hazards are traditionally things like nuclear waste, nuclear weapons, PCBs, DNA technology, DDT and large dams. It is inconceivable that the risk from trees would be classified as dread risk. The risk is in fact almost certainly the opposite in nature, placing it far over on the left of Figure 1.

Likewise, in terms of the y-axis of Figure 1, trees pose risks which are observable, generally known to those exposed, have immediate effects, are an old established risk, and are well known to science and even in this case the public. Therefore, the risk of trees can be expected to be located firmly in the bottom-left corner of Figure 1. The risk is therefore not one that would be expected to give rise to any public demand for greater regulation.<sup>17</sup>

It can also be seen that none of the six HMT concern criteria listed in Table 1 could seriously be expected to be invoked by trees. The public concern assessment of trees would appear to draw a blank on all recognised decision criteria. This conclusion is of course about trees in general, it does not mean that there are no individual instances of trees causing local concern.

---

<sup>15</sup> Gill, S.E., Handley, J. F., Ennos, A. R. and Pauleit (2006) Adapting cities for climate change: the role of the green infrastructure, *Built Environment* 33(1): 115-133.

<sup>16</sup> House of Lords Select Committee on Economic Affairs (2006) Government policy on the management of risk, Vol. 1 para 34.

<sup>17</sup> Paul Slovic has confirmed that he would expect the risk from falling trees to be firmly located in the bottom left quadrant of Figure 1 (pers. com., 2008).

### 5.3 The UK's regulatory framework

Over several decades, with roots going back much further, the UK has formulated a philosophy of risk decision making sometimes referred to as the 'Tolerability of risk' or ToR framework. This is set out in Figure 4. So far as the present discussion of risk perception is concerned, the most important feature of this framework is the location of the boundary between the zones of 'tolerable' and 'broadly acceptable' risk.<sup>18</sup>

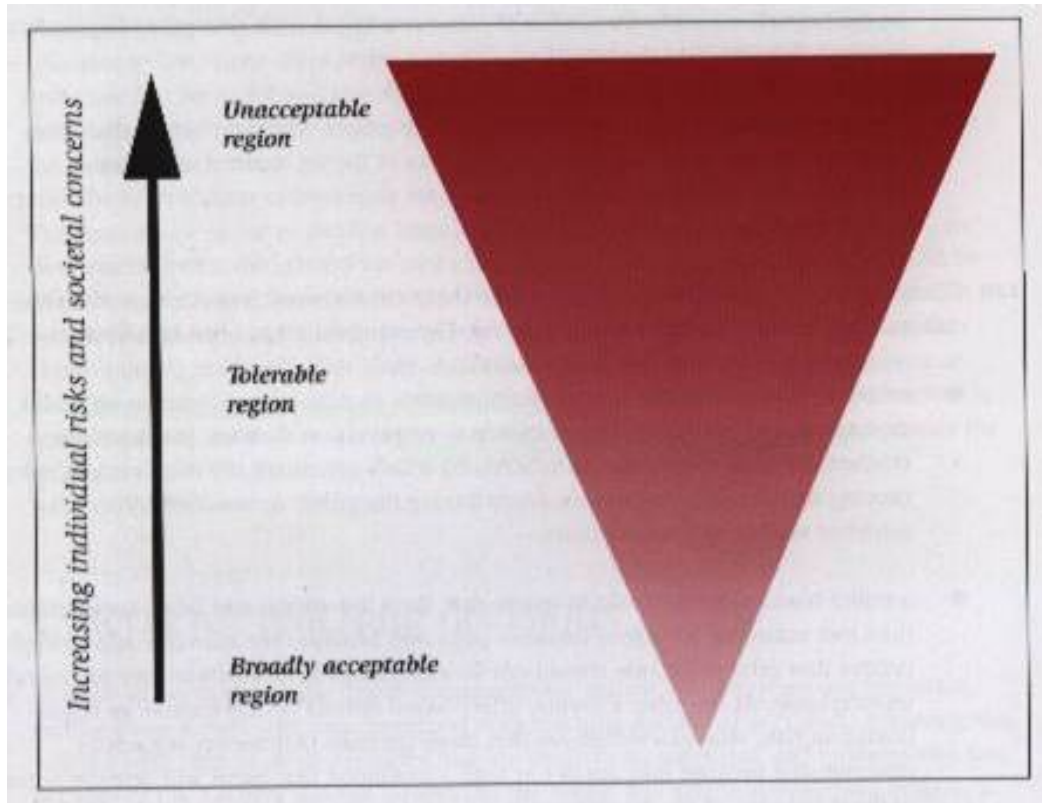


Figure 4: HSE framework for the Tolerability of Risk

According to the HSE, and prior to that The Royal Society,<sup>19</sup> an individual risk of death of one in a million per annum corresponds to a very low level of risk and should be used as a guideline for the boundary between the broadly acceptable and tolerable regions (para. 130). For hazards posing a level of risk below this boundary, these risks are “generally regarded as insignificant and adequately controlled” (para. 123). Furthermore, “The levels of risk characterising this region are comparable to those that people regard as insignificant or trivial in their daily lives” (para. 123).

The existing data, currently being verified as the first element of this work for the NTSG, point clearly to an average risk to members of the British public from trees which is well inside the broadly acceptable region. The HSE has made reference in its SIM to the low level of risk posed by trees, though this is couched differently in terms of risk per tree rather than individual risk per person.

<sup>18</sup> HSE (2001) Reducing risks, protecting people (HSE Books).

<sup>19</sup> The Royal Society (1983), Risk assessment – a study group report.

## 5.4 Court perspectives

It has been noted elsewhere<sup>20</sup> that the courts of the first instance (lower courts) tend not to make overt reference to antecedent levels of risk in making judgements about cases involving risk, preferring to make greater use of compliance with standards, approved codes of practice, and expert opinion. However, the appeal courts are more likely to refer back to actual risk levels in making their judgements.

An example is *R v Porter* [2008], in which HSE brought a criminal prosecution under the HSWA against the headmaster of a private school in Wales. A small boy had jumped down some steps while playing 'batman' in the playground, banged his head, was taken to hospital where he was found to have a relatively minor head injury, with neither a skull fracture nor even a cut. Later he contracted MRSA in hospital and died. The HSE's case against the school was based primarily upon an alleged insufficiency of supervision in the playground and a failure to do a thorough enough risk assessment of the school grounds. The initial trial by jury was won by the HSE, despite expert testimony that the risk posed by the steps was insignificant and routine, and despite the judge posing the following question in his summing up:

“What you must decide is whether there was an unacceptable risk. The trivial risks of everyday life are not unacceptable. They are simply a fact of life, are they not?”

This judgement was subsequently quashed on appeal by Lord Moses.<sup>21</sup> According to Gerard Forlin and Patrick Harrington QC,<sup>22</sup> who appeared for the appellant in this case, the decision “expanded the law from the definition of risk to encompass the conditions of day to day life... This judgement appears to go some way in rebalancing the law in the field of health and safety; it categorically reaffirms that there must be a real, not theoretical or fanciful risk involved to trigger the Act; lesser risk will not be an acceptable test in the future.”

An earlier example can be found in the House of Lords judgement regarding *Tomlinson v Congleton Borough Council* [2003].<sup>23</sup> In this case a young man had severely and permanently incapacitated himself whilst executing a shallow dive in a council-owned mere. Lord Hobhouse made the following observations:

“The second point is the mistreatment of the concept of risk. To suffer a broken neck and paralysis for life could hardly be a more serious injury; any loss of life is a consequence of the greatest seriousness. There was undoubtedly a risk of drowning for inexperienced, incompetent or drunken swimmers in the deeper parts of the mere or

---

<sup>20</sup> D J Ball, D Maggs and M Barrett (2008) 'Risk actors and public risk - *Judges, courts and the legal profession*,' Report to Department for Business, Enterprise and Regulatory Reform.

<sup>21</sup> Lord Justice Moses, Mr Justice Beatson and Sir Richard Curtis, Royal Courts of Justice, 19 May 2008.

<sup>22</sup> G Forlin and P Harrington QC, *R v Porter*, Archbold News p6, Issue 6, 6 July (2008).

<sup>23</sup> House of Lords 31 July 2003 Judgments – *Tomlinson v Congleton Borough Council*.

in patches of weed when they were out of their depth although no lives had actually been lost. But there was no evidence of any incident where anyone before the claimant had broken his neck by plunging from a standing position and striking his head on the smooth sandy bottom on which he was standing. Indeed, at the trial it was not his case that this was what had happened; he had alleged that there must have been some obstruction. There had been some evidence of two other incidents where someone suffered a minor injury (a cut or a graze) to their head whilst diving but there was no evidence that these two incidents were in any way comparable with that involving the claimant. It is then necessary to put these few incidents in context. The park had been open to the public since about 1982. Some 160,000 people used to visit the park in a year. Up to 200 would be bathing in the mere on a fine summer's day. Yet the number of incidents involving the mere were so few. It is a fallacy to say that because drowning is a serious matter that there is a serious risk of drowning. In truth the risk of drowning was very low indeed and there had never actually been one and the accident suffered by the claimant was unique. Whilst broken necks can result from incautious or reckless diving, the probability of one being suffered in the circumstances of the claimant were so remote that the risk was minimal. The internal reports before this accident make the common but elementary error of confusing the seriousness of the outcome with the degree of risk that it will occur." (para. 79)

Lord Hobhouse continued as follows:

"The third point is that this confusion leads to the erroneous conclusion that there was a significant risk of injury presented to the claimant when he went into the shallow water on the day in question. One cannot say that there was no risk of injury because we know now what happened. But, in my view, it was objectively so small a risk as not to trigger s.1(1) of the 1984 Act,<sup>24</sup> otherwise every injury would suffice because it must imply the existence of some risk. However, and probably more importantly, the degree of risk is central to the assessment of what reasonably should be expected of the occupier and what would be a reasonable response to the existence of that degree of risk. The response should be appropriate and proportionate to both the degree of risk and the seriousness of the outcome at risk. If the risk of serious injury is so slight and remote that it is highly unlikely ever to materialise, it may well be that it is not reasonable to expect the occupier to take any steps to protect anyone against it. The law does not require disproportionate or unreasonable responses." (para. 80)

---

<sup>24</sup> This is a reference to the Occupiers' Liability Act, this being a civil and not criminal prosecution (unlike *R v Porter*).

## **6. Conclusions**

Notwithstanding there is currently a widely-held view in society that both actual and perceived health concerns are relevant factors in risk decisions, as inferred in HSE's SIM, the evidence reported here based on:

- psychometric studies
- HMT's concern assessment criteria
- consideration of societal risk
- societal concerns
- the UK's Tolerability of Risk framework
- appeal court decisions

provides no support for the position that the risk posed by trees in most instances is anything other than a routine, recognised, and widely-accepted risk of life. In other words, *ex-ante* decisions about the management of trees in general should proceed on a rational, cost-effective basis as they do not invoke additional concerns about perceived risk. This is not to say that there are not other broader concerns about trees and their management, such as ecological, landscape and aesthetic value, which should be taken into account in arboricultural and land management decision making.