Bomen beter Beheren VZW

Samen voor
een beter en gewaardeerd bomenbestand
in onze leefomgeving

Bomen beter Beheren VZW

QTRA

A risk from falling trees exists only if there is both potential for tree failure and potential for harm to

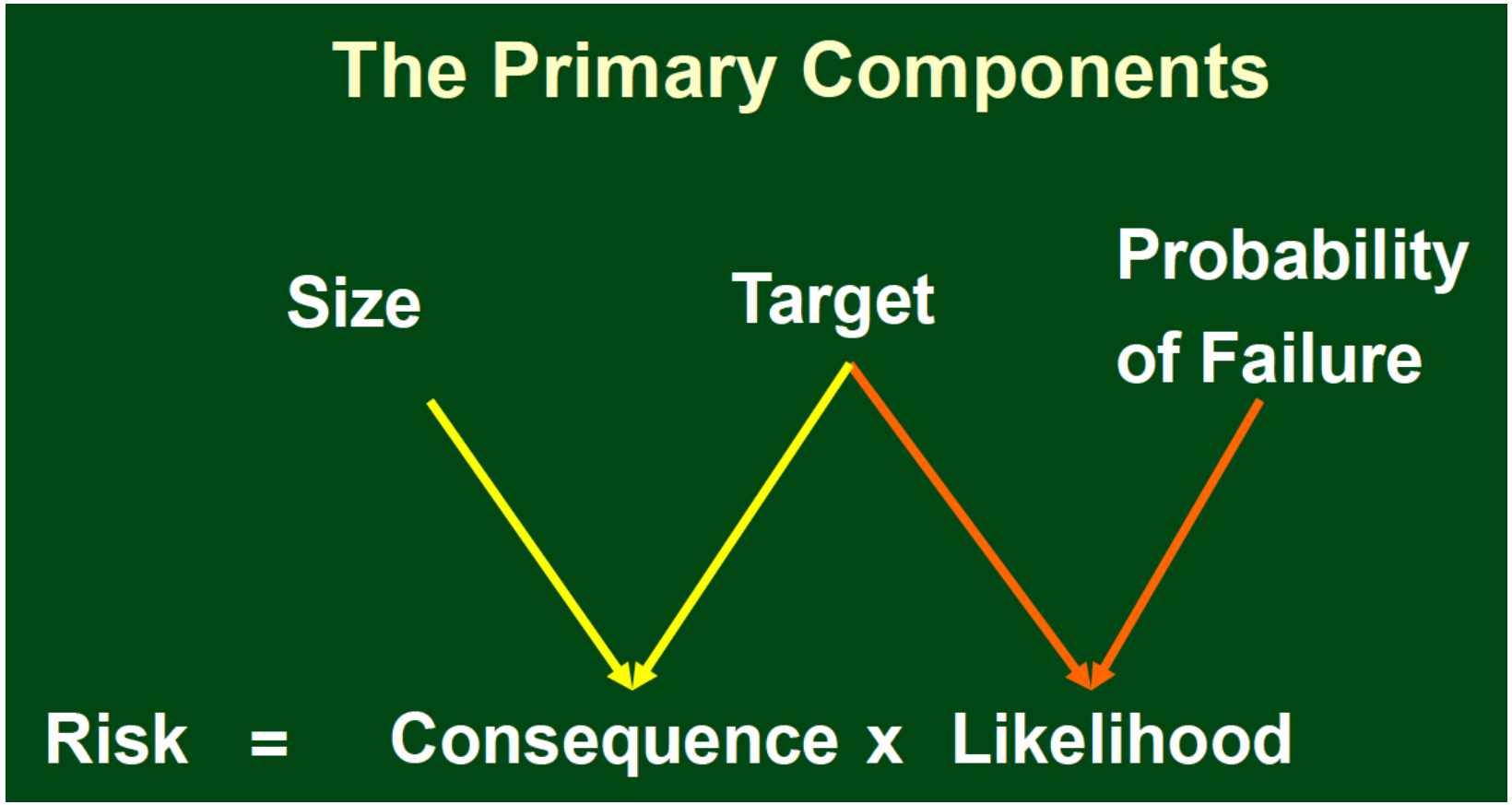
Bomen beter Beheren VZW

QTRA

- QTRA uses 3 primary input values
  - Target
  - Size
  - Probability of Failure

Bomen beter Beheren VZW

QTRA



Bomen beter Beheren VZW

QTRA

1) Target

- Moderately easy to quantify
- Most important component - without a significant 'Target' there cannot be a significant risk of harm

2) Size

- Moderately difficult to quantify, but we have done it for you

3) Probability of Failure

- Most difficult component to quantify. We provide benchmarks, guidance and calibration

Bomen beter Beheren VZW

QTRA

Bomen beter Beheren VZW

QTRA

Table 4. QTRA Advisory Risk Thresholds

Thresholds	Description	Action
	Unacceptable Risks will not ordinarily be tolerated	• Control the risk
1/1,000		
	Unacceptable (where imposed on others) Risks will not ordinarily be tolerated	• Control the risk • Review the risk
	Tolerable (by agreement) Risks may be tolerated if those exposed to the risk accept it, or the tree has exceptional value	• Control the risk unless there is broad stakeholder agreement to tolerate it, or the tree has exceptional value • Review the risk
1/10 000		
	Tolerable (where imposed on others) Risks are tolerable if ALARP	• Assess costs and benefits of risk control • Control the risk only where a significant benefit might be achieved at reasonable cost • Review the risk
1/1 000 000		
	Broadly Acceptable Risk is already ALARP	• No action currently required • Review the risk

Bomen beter Beheren VZW

QTRA

What is ALARP ?

- As Low As Reasonably Practicable
- Doing what is reasonable and proportionate having considered all of the circumstances
- Not having to do everything that you possibly could

Bomen beter Beheren VZW

QTRA

Costs & Benefits of Risk Reduction

Benefits

- Risk reduction
- Retaining the tree
- Achieving other management objectives

Bomen beter Beheren VZW

QTRA

Costs & Benefits of Risk Reduction

Costs

- Financial – diverting finite resources
- Risk transfer – to public and tree workers
- Losses
  - Ecological resource
  - Amenity
  - Psychological wellbeing
  - Noise attenuation
  - Shade and shelter
  - Flood control
  - Interception of pollutants

Bomen beter Beheren VZW

QTRA

Table 1. Annual risk of death from various causes over entire population

Cause of death	Annual risk	Basis of risk and source
Cancer	1 in 387	England and Wales 1999
Injury and poisoning	1 in 3,137	UK 1999
All types of accidents and other external causes	1 in 4,064	UK 1999
All forms of road accident	1 in 16,800	UK 1999
Lung cancer from radon in dwellings	1 in 29,000	England 1996
Gas incident (fire, explosion or carbon monoxide poisoning)	1 in 1,510,000	GB 1994/95–1998/99
From trees	1 in 10,000,000 or less if high wind incidents are excluded	This study
From lightning	1 in 18,700,000	England and Wales 1995–99

Bomen beter Beheren VZW

QTRA

ToR

toelaatbaarheid van risico

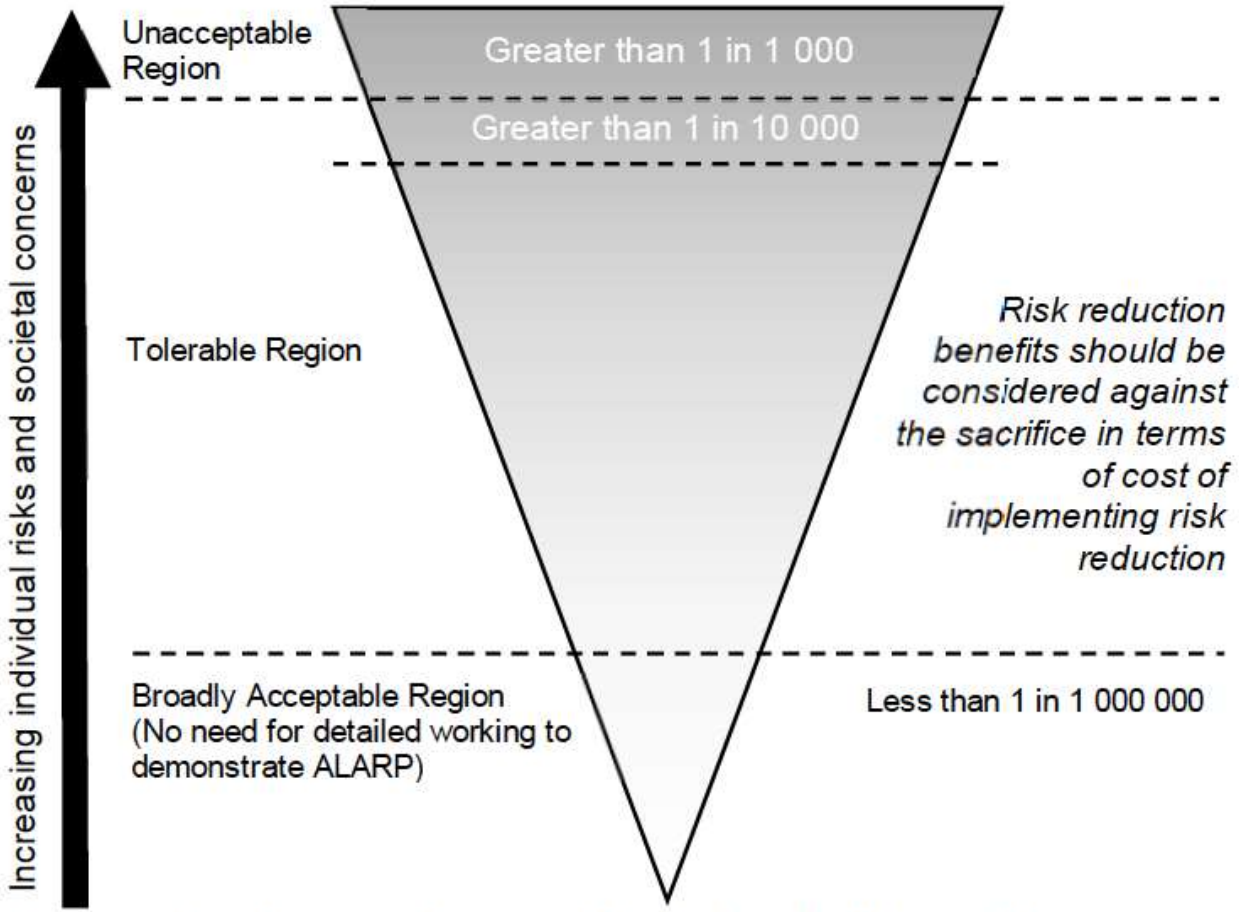


Figure 1. Adapted from the Tolerability of Risk framework (HSE 2001).

Bomen beter Beheren VZW

QTRA

- The focus of QTRA is on applying the principles of reasonable practicability

Bomen beter Beheren VZW

QTRA

The Value of Statistical Life

- 'Value of Statistical Life' is a risk management tool that facilitates consideration of the benefits of risk reduction against its costs
- Value of Statistical life in QTRA is currently €2 400 000
- QTRA uses this tool to apply a probabilistic value to property and possessions

Bomen beter Beheren VZW

QTRA

Estimating Probability of Failure

When estimating Probability of Failure (PoF), we consider the likelihood, or chance, that the tree will fail onto a given target within the coming year. To assist this assessment, we use the benchmarks:

- PoF Range 7 represents the whole tree or branch that we consider to be consider to be mechanically acclimatised to the normal annual cycle of weather
- Range 1 represents the severely compromised tree that we estimate is between certain and having a tenth of a chance of failing within the coming year under the normal annual cycle of weather

Bomen beter Beheren VZW

QTRA

Assessing Structure & Stability

Some key considerations when assessing the structural condition of a tree and estimating the probability of tree or branch failure

1. Vitality
   - Foliage size, colour, density and distribution
   - Wound closure and signs of structurally adaptive growth
2. Exposure and Load
   - Height of the tree
   - Crown position, shape and branch distribution
   - Stem and branch size and shape
   - Location
   - Protection from wind by landform, buildings and other vegetation
   - Recent changes around the tree
3. Residual Strength
   - Material properties and distribution of non-decayed wood
   - Type and distribution of decay
4. Species Profiles
   - Species ability to compartmentalise and contain the spread of decay
   - Heartwood/sapwood ratio
   - Sapwood distribution

Bomen beter Beheren VZW

QTRA

4. INFORMING MANAGEMENT DECISIONS

Balancing Costs and Benefits of Risk Control

When controlling risks from falling trees, the benefit of reduced risk is obvious, but the costs of risk control are all too often neglected. For every risk reduced

Bomen beter Beheren VZW

QTRA

4. INFORMING MANAGEMENT DECISIONS

Considering the Value of Trees

It is necessary to consider the benefits provided by trees, but they cannot easily be monetised and it is

Bomen beter Beheren VZW

QTRA

4. INFORMING MANAGEMENT DECISIONS

Understanding of the costs with which risk reduction is balanced can be informed by the risk assessor's knowledge, experience and on-site observations, but the risk management decisions should be made by the tree manager. That is not to say that the tree manager