



Vegetation Fire Risk Management:
Toolkit for Practitioners and Advisors

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1. INTRODUCTION

PURPOSE AND AUDIENCE

The purpose of this toolkit is to provide landowners, advisors and those interested in a risk-based approach to reducing the likelihood and severity of vegetation fires in the United Kingdom. It should be read in conjunction with Vegetation Fire Control Measures. This toolkit was designed and consulted upon by a wide range of stakeholders within the South East England Wildfire Group and England and Wales Wildfire Forum.

LAND MANAGEMENT APPROACH

A key consideration is the acceptance of a managed, rather than a 'natural' environment that requires regular active management to reduce the wildfire risk. Therefore non/minimum-intervention practices may not be appropriate in areas of fire risk. This toolkit reflects the unique character of each site as well as the landscapes they fit within.

BACKGROUND

Vegetation fires are a natural part of the normal climate and of the biosphere. This has been called a 'necessary symbiosis', in which fire and life have benefited from each other's effects. In the past have been caused by volcanoes, lightning and rockslides but now the major cause is man made. Therefore the wildfire risk can not be eliminated but the scope, scale and impact of incidents can be reduced.

WHAT ARE VEGETATION FIRES?

Vegetation fires can be wildfire incident or prescribed burning operation that uses vegetation as their fuel. They can occur over a wide range of land uses (forestry, military training areas, areas of conservation, road and rail networks, green infrastructure and agricultural land), habitats (woodland, dwarf scrub heath, grassland etc.) and cover a few square metres or tens to hundreds of hectares.

Wildfires Incidents

The majority of vegetation fires are small incidents, many of which go unreported to landowners and/or Fire and Rescue Services. Some of these events have the potential to develop into larger scale wildfire incidents that can consume considerable natural resources as well as social, economic and environmental impacts (as defined in Appendix A). Major incidents occur when a number of factors become aligned. Wildfires are of concern because

they have the potential to be spatially highly dynamic and can occur over large areas. Additionally incidents can be resource intensive and occur over prolonged periods.

Prescribed Fires

Prescribed burning (sometimes called controlled fires) is a tool to manage vegetation variety of habitats. However it does have the additional benefit of reducing fuel loading. As with other management practices prescribed burning will only be appropriate on a limited number of sites due to ecological and operational limitations and impacts on surrounding risk factors (detailed in Appendix A).

2. APPLICATION TO LAND AND FIRE MANAGEMENT

The approach taken in this guidance can be applied to any land holding to define appropriate strategies and management practices. Below are examples for use in the rural and built environment:

- | | |
|-------------------------|--|
| Fire and Rescue Service | <ul style="list-style-type: none">• Risk Information• Integrated Risk Management Planning (IRMP) |
| Land Management | <ul style="list-style-type: none">• Site Management Planning• Open Habitats Policy and Environmental Impact Assessments• Grant funding |
| Local Authority | <ul style="list-style-type: none">• Risk mapping for development and civil contingency planning |

DEFINING THE SCALE AND SCOPE OF THE RISK MANAGEMENT APPROACH

The majority of our rural and urban areas, at present, are unlikely to be effected by vegetation fires. Therefore a pragmatic approach should be adopted when considering vegetation fire risk management. This can be achieved by breaking up the risk management at appropriate levels.

Landscape scale level

Landscape scale is defined as a holistic, multi-functional approach to biodiversity conservation, local economics and social issues, that looks at a wide range of habitats rather than at specific species. Spatially they are usually defined by Landscape Character Assessments to provide a distinct, recognisable and consistent pattern of elements, be it natural (soil, landform) and/or human (for example settlement and development) in the landscape that makes one landscape different from another. At this level the landscape is made up of numerous land ownership and varied mosaics of habitats and species. Not all habitats may be susceptible to wildfires but a rough analysis of fire incidents from FRS's can soon help target areas that should be the focus of risk management.

Site scale level

At the site level the landowner and managers consider the vegetation fire impacts on their own site. Careful consideration should be given to adjacent land use and neighbouring sites. The approach outlined in this document can be integrated into existing management planning and therefore build upon existing preparedness and prevention measures.

You may wish to consider using the following tools to help inform your decision making:

- Your own reporting systems and evidence
- FRS's Incident Reporting System (IRS) and Integrated Risk Management Plans (IRMP)
- Local Authorities Community Risk Registers (CRR) and Local Risk Registers (LRR)

3. RISK MANAGEMENT

Each site at risk is unique in its species composition, shape, size, topology, accessibility, fuel composition etc. as well as by the events that affect it (e.g. climate, weather, users etc.). This forms a complex matrix that can change in subtle ways without warning. In order to capture some of these issues a risk-based approach is used to help define possible hazards and define their risk.

RISK ANALYSIS PROCESS

The guidance in this document uses a six-stage approach to calculate site risk. The flow chart in Appendix B defines the process and the stages are as follows:

- Stage 1:** Priority Setting
- Stage 2:** Habitat and Species at Risk
- Stage 3:** Risk Assessment of Vegetation Fire Hazards
- Stage 4:** Impact of Public Access
- Stage 5:** Site Risk Rating
- Stage 6:** Review setting

The risk management template in Appendix C can be used to formally record and summarise the outcomes of the analysis. This can then be integrated in to the desired application, such as site management planning or Environmental Statements.

STAGE 1 – PRIORITY SETTING

When considering vegetation fires in management plans the landowner should consider Fire and Rescue Service priorities during their response to incidents and defined in their order of importance:

- **High Priority: Life** e.g. Public, employees and fire fighters.
- **Middle Priority: Property & Businesses** e.g. Residential dwellings, retail, commercial and industrial as well as timber and food crops, sporting and tourism.
- **Lower Priority: Environment** e.g. Species and habitats (plants and animal life)

Land managers and advisors must ensure these priorities are defined. They are primary focus of decision making where the risk level is greater than low.

STAGE 2 – HABITATS AND SPECIES AT RISK

Habitats and species require climatic influences, some not visually noticeable, over days, weeks and months for the right conditions for wildfire to occur. The most important of these subtle phenomena is drought causing long term loss of moisture in vegetation increasing susceptibility to ignition.

The risk to habitats and species considerable variety and complexity so a simple approach has been adopted. Table 1 defines Broad Habitat Classifications (Jackson, 2000) that are at a low to high risk. When defining risk the age of species is an important factor. Table 2 provides a simplified definition of young and mature species at high risk for reference. Both tables are taken from policy guidance (CLG, 2008) on wildfires.

Table 1 – Susceptibility of habitats

Sectors	Risk Rating (Broad Habitat Classification)	
	High	Low
Forestry	Coniferous Woodland	Broadleaves, mixed and yew woodlands Boundary and linear features
Heathland and Moorland	Dwarf shrub heath Bracken	Bogs
Agricultural	Arable and horticulture	Improved grassland Neutral grassland Calcareous grassland Acid grassland
Rural Infrastructure		Built up areas and gardens Rivers and streams, Standing open water and canals
Built Infrastructure	Built up areas and gardens (including roadside and railway side vegetation).	

Table 2 – Susceptible species

Sectors	Risk species by age groups	
	Young	Mature
Forestry (1)	<ul style="list-style-type: none"> • Pines (<i>Pinus species</i>) • Spruce (<i>Picea species</i>) • Firs (<i>Abies species</i>) • Eucalyptus (<i>Eucalyptus Species</i>) 	<ul style="list-style-type: none"> • Eucalyptus (<i>Eucalyptus species</i>)
Agricultural	<ul style="list-style-type: none"> • Arable Crops • Grasses 	<ul style="list-style-type: none"> • Arable Crops (2) • Grasses
Heathland and Moorland Green and Built Infrastructure	<ul style="list-style-type: none"> • Grasses • Dry Heath (<i>Calluna species</i>) • Wet Heath (<i>Erica species</i>) (3) • Gorse (<i>Ulex species</i>) 	<ul style="list-style-type: none"> • Grasses • Dry Heath (<i>Calluna species</i>) • Wet Heath (<i>Erica species</i>) (3) • Gorse (<i>Ulex species</i>)

Notes:

(1) Young trees are defined as being within 5 to 20 years old

(2) Crops nearing maturity for harvest are at highest risk

(3) Drought and the intensity of fire can limit the resilience of wet heath to combustion.

STAGE 3 – RISK ASSESSMENT OF HAZARDS

Risk Assessment

Risk assessment of hazards is the careful examination of what could cause harm to life, property and the environment, so that you can weigh up precautions need and prevent harm. The risk assessment process is defined in Section 5.

Gauging the depth of risk assessment needed

The guidance has been design to provide two approaches to risk assessment using the templates in Appendix D:

- **Scoping Wildfire Risk Assessment** – A simple and quick assessment of hazards to define the risk. This approach allows land managers and advisors to scope out issues and gauge if a more detailed assessment is necessary.
- **Full Specific Wildfire Risk Assessment** – A more detailed and comprehensive assessment of hazards build upon the scoped out risks and the supporting hazards checklist in Appendix E. This approach is appropriate for site management plans, Fire and Rescue Service risk planning, Environmental Statements and grant applications.

Vegetation fire hazards

The hazards associated with vegetation fires are divided into two groups;

- Site hazards
- Infrastructure and asset hazards

Site hazards reflect the properties characteristics, its uses and the land management upon and adjacent to it from the wildfire risk. Infrastructure and assets hazards consider man made and natural features and facilities that may be effected by a wildfire.

This may cause an adverse effect on people, businesses and the surrounding environment. Appendix E provides two checklists but it should be noted that they are by no means exhaustive and other site-specific hazards should be considered if appropriate.

Site Hazard Checklist

Site risks are generic hazards to be considered when undertaking assessments. The checklist defines hazards under the following list:

- **Site characteristics:** Size of fire possible, adjacent land, topographical and natural protection features, unexploded ordnance, access, fuel loading, previous incidents
- **Climate and weather:** Exposure, drought and heat resilience
- **Management and training:** Wildfire or prescribed fire training, fire contingency and management planning
- **Land management practices:** Effectiveness of management practices, prescribed fire planning, detection and prevention of wildfires.
- **Land management activities:** Safety of machinery used, implementation, use of pyrotechnics and prescribed burning.

Infrastructure and asset hazard checklist

Our rural and built environment has upon it infrastructure and/or assets that have important local, regional and national needs. Their disruption, damage or loss can have considerable impact upon our lives. These 'Risk factors' are defined in Appendix A and cover the following:

- **Major infrastructure:** Buildings, transport and wayleaves
- **Environmental assets:** Nature conservation, landscape and heritage designations
- **Social assets:** Recreation and leisure, cultural, heath and aesthetic values
- **Economic assets:** Food, timber, biofuel production, sporting, tourism etc.

STAGE 4 – IMPACT OF PUBLIC ACCESS

As not all sites allow or have public access upon them, so the impact caused by public access has been separated from other hazards. Where access is possible it may be statutory linear (e.g. Public Rights of Way), or area (e.g. CRoW¹ Open Access land) or may be by permissive agreement. It should be noted that people are the primary cause of the majority of incidents either deliberately or accidentally. It is therefore important to consider the amount and type of accessibility (e.g. foot, bicycle, horse, motor vehicles) and the activities undertaken (e.g. ranging from motor rallies, orienteering events, to quiet conservation walks). Where

public access is allowed the types of hazard should be identified and the risk rating should be calculated using Section 5.

Priorities for Public Access

The landowner, manager or tenant should consider the following:

- **Life** – their ‘Duty of Care’² for all that enter upon their land
- **Property and business** – Facilities and income from allowing access (e.g. cafes, cycle hire, shops, car parking charges, Christmas trees etc.) that could be disrupted, damaged or destroyed.
- **Environment** – Conservation, landscape and heritage assets they may attract the public and could be damaged or destroyed.

Control measures

If required the following control measures should be selected to reduce the risk level to low:

- **Visitor management** – car park sizes, targeting event or activities outside the fire season, location of access points
- **Fire patrols during susceptible periods** – during heat waves or after long periods of drought
- **Appropriate awareness raising** – working in partnership with Fire and Rescue Services and neighbours

STAGE 5 – SITE RISK RATING

The final stage is to define the sites overall risk rating. This is defined from the highest risk rating from Stages 3 and 4. For example if two site hazards are high, but all infrastructure, assets and impacts of public access is low, the site will have a high-risk rating.

STAGE 6 – REVIEW SETTING

All risk assessments require a review date or period to ensure that they respond to changes on site or adjacent too as well as evolving risks. It is recommended that a review is set annually or after major land use or habitat and species change. The review should cover the previous five stages of the wildfire risk analysis.

¹ CRoW – Countryside and Rights of Way Act 2000.

² With regard to the Health and Safety at Work Act 1974 and its regulations and the Occupiers Liability Act 1957 and 1984.

4. RISK ASSESSMENT

RISK ASSESSMENT STEPS

Risk assessment is the careful examination of what could cause harm to life, property and the environment, so that you can weigh up precautions need and prevent harm. The following six steps should be used when assessing risks:

Step 1 – Identify hazards:

- Site hazards
- Infrastructure hazards

Step 2 – What might be harmed:

- Life
- Property and businesses
- Environment

Step 3 – Evaluate the risks :

- Considering the likelihood and severity.
- Define a risk rating and decide on precautions that are proportionate to the overall risk.
- Take into consideration existing control measures and their effectiveness.

Step 4 – Define appropriate additional control measures:

- See Section 5 – Control Measures (Table 7) and Risk Management Control Measures Guidance
- See Stage 4 – Impact of Public Access to bring the risk level down.

Step 5 – Re-evaluate the risk rating:

- Use the process in Step 4 but consider the mitigation effects of the additional control measures.

Step 6 – Define the hazards risk rating:

- Low (1 to 5),
- Medium (6 to 10),
- High (12 to 16)
- Unacceptable (20 to 25).

Step 7 – Review triggers:

- Set a review date/period for your assessment.
- Monitor and review after change of land use, species or habitat

EVALUATING RISK

By using the risk assessment matrix in Table 3, a site or management units risk rating can be calculated and one of four levels of risk defined; unacceptable, high, medium or low.

Table 3 – Risk assessment matrix

			Likelihood				
			Very unlikely	Unlikely	Moderate	Likely	Very likely
			1	2	3	4	5
Severity	Negligible	1	1	2	3	4	5
	Minor	2	2	4	6	8	10
	Serious	3	3	6	9	12	15
	Major	4	4	8	12	16	20
	Fatalities	5	5	10	15	20	25

Risk rating:

1-5	Low	6-10	Medium	12-16	High	20-25	Unacceptable
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Likelihood and severity

A risk rating is achieved by multiplying the likelihood of a fire starting by the severity of damage. These are defined and valued in Tables 4 and 5 respectively. Severity is defined by the consequence on three priorities: life, property & businesses and environment. Where sites have more than one priority on site, they should all be assessed and the highest risk used to define the overall level of severity.

Table 4 – Measure of Likelihood of a fire starting (Probability)

Level	Descriptor	Chance	Descriptor
1	Very unlikely	0–20%	The event may occur only in exceptional circumstances
2	Unlikely	21–40%	The event could occur at some time
3	Moderate	41–60%	The event will occur at some time
4	Likely	61–80%	The event could occur in most circumstances
5	Very Likely	81–100%	The event will occur in most circumstances

Table 5 – Measure of Severity damage (Consequence)

Level	Descriptor	Chance	Description
1	Negligible	0.005%	<p>Life – Minor local first aid treatment (e.g. minor cuts/abrasions) causing minimal work interruption.</p> <p>Property and Business – No financial loss or damage.</p> <p>Environment – Damage to habitats and species will recover in less a year.</p>
2	Minor	0.05%	<p>Life – Injury requiring first aid treatment causing inability to continue with current work activity for 3 days or less.</p> <p>Property and Business– Minor: financial losses (up to 1% of profit), disruption and/or damage and impact on reputation.</p> <p>Environment – Minor damage to habitats and species but able to recovery to previous capacity between 1 to 5 years.</p>
3	Serious	0.5%	<p>Life – Medical treatment required. RIDDOR over 3 day lost-time injuries.</p> <p>Property and Business – Serious: financial losses (up to 5% of profit), disruption or damage and impact on reputation.</p> <p>Environment – Serious damage to habitats and species taking between 5 to 10 years to recovery to previous capacity.</p>
4	Major	5%	<p>Life – Permanent or life changing injuries. RIDDOR major injuries.</p> <p>Property and Business – Major: financial losses (up to 10% of profit), disruption or damage and impact on reputation.</p> <p>Environment – Major damage to habitats and species taking between 10 to 20 years to recovery to previous capacity.</p>
5	Fatalities	50%	<p>Life – Single or multiple deaths</p> <p>Property and Business – Destruction of the property (total loss) or business and impact on reputation.</p> <p>Environment – Irreversible impact on habitats or species.</p>

RISK RATING

The calculation should include any existing control measures in place in order to assess their effectiveness. As defined in Table 6 medium to unacceptable risk sites should use control measures to reduce the risk to low. This will require the use of mandatory and/or primary control measures, to reduce the risk. In order to ensure that control measures are implemented effectively they are defined within the four contingency phases of an incident: preparedness, prevention, response and recovery. Please see across for details on control measures.

Table 6 – Risk rating and control measures

Level	Descriptor	Description
4	Unacceptable	Unacceptable hazard. Prescribed burning is not advised
3	High	Unacceptable hazard. Task/s must have control measures
2	Medium	Acceptable hazard but task/s is subject to control measures
1	Low	Acceptable hazard. Monitor hazard

It is recommended that this process be undertaken in combination with site visits to assess individual management units and consultation with interested parties i.e. landowner, managers, tenants, neighbours, contractors, public etc.

CONTROL MEASURES

The use of control measures is common practice amongst organisations and part of good business management. In many cases they are integrated within other processes, documentation and operations, thus reducing costs and management burden. The risk control process requires the assessor to either eliminate, or reduce, or isolate the hazard.

Table 7 provides a matrix of mandatory and primary requirements defined by the four contingency phases: preparedness, prevention, response and recovery. Risk based control measures reduce impact by placing a stronger emphasis on preparedness and prevention before the incident to reduce or limit the likelihood and severity. This also improves the effectiveness and reduces the cost of response during the incident and recovery afterwards. Please see the guidance document Risk Management Control Measures for greater detail.

Table 7 – Control measures

Contingency	Control Measures	
Phase	Mandatory	Primary
Preparedness	<ul style="list-style-type: none"> • Fire plans/maps 	<ul style="list-style-type: none"> • Wildfire Management plan • Species selection • Design planning • Prescribed fire management and operation plans* • Training (prescribed fire operations) • Standard Operating Procedures (SOP) • Partnership working • Define a competent person/s
Prevention	Not applicable	<ul style="list-style-type: none"> • Fire and fuel breaks • Fire belts • Vegetation fuel management practices • Visitor management • Fire patrols during susceptible periods • Appropriate awareness raising
Response	Not applicable	<ul style="list-style-type: none"> • Improving initial attack • Supporting FRS Incident Commanders • Long duration incidents
Recovery	<ul style="list-style-type: none"> • Vegetation fire reporting systems 	<ul style="list-style-type: none"> • Salvage of crops and facilities • Restoration of habitats and species • Rebuilding or repair of property

Note: * Only used when prescribed burning operations are considered.

5. REFERENCES

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APPENDIX A – INFRASTRUCTURE AND ASSETS

Major Infrastructure

Major Infrastructure adjacent to habitat type, including:

a) Transport Infrastructure

- Airport flight paths
- Motorways or important 'A roads', and
- Railways and associated facilities and structures.

b) Wayleave infrastructure:

- Overground wayleaves: e.g. power lines, communications
- Underground wayleaves: e.g. fuel pipeline, major sewers, major water pipelines

c) Buildings:

- monuments,
- listed buildings,
- residential and commercial, industrial etc.

Environmental assets

Areas of ecological importance, including:

a) Sites of Special Scientific Interest (SSSI)

b) Special Protection Areas (SPA)

c) Special Areas of Conservation (SAC)

d) Ramsar (Wetlands)

e) National Nature Reserves (NNR)

f) Environmentally Sensitive Areas (ESA)

g) Scheduled Ancient Monuments (SAM)

Social assets

a) Recreation and leisure

b) Cultural heritage

c) Aesthetic value

d) Health and wellbeing

e) Community cohesion.

Economic assets

a) Food, fibre and fuel produce

b) Sporting

c) Tourism

APPENDIX B – RISK ANALYSIS TEMPLATE

Site Name:

Date of assessment: / /

FRS Site Code:

Landowner:

6 Figure Grid Reference:

Stage 1 – Priority setting

	Who or what is at risk?
Priority 1 – Life:	
Priority 2 – Property and Business:	
Priority 3 – Environment:	

Stage 2 – Habitat and species at risk

Habitat	Species	Risk Rating

Stage 3 – Summary of risk assessment of site, infrastructure & asset hazards (Appendix D)

Hazard	Control Measures (Existing and Additional)	Risk Rating

Stage 4 – Impact of public access

Access issues	Control Measures(Existing and Additional)	Risk Rating

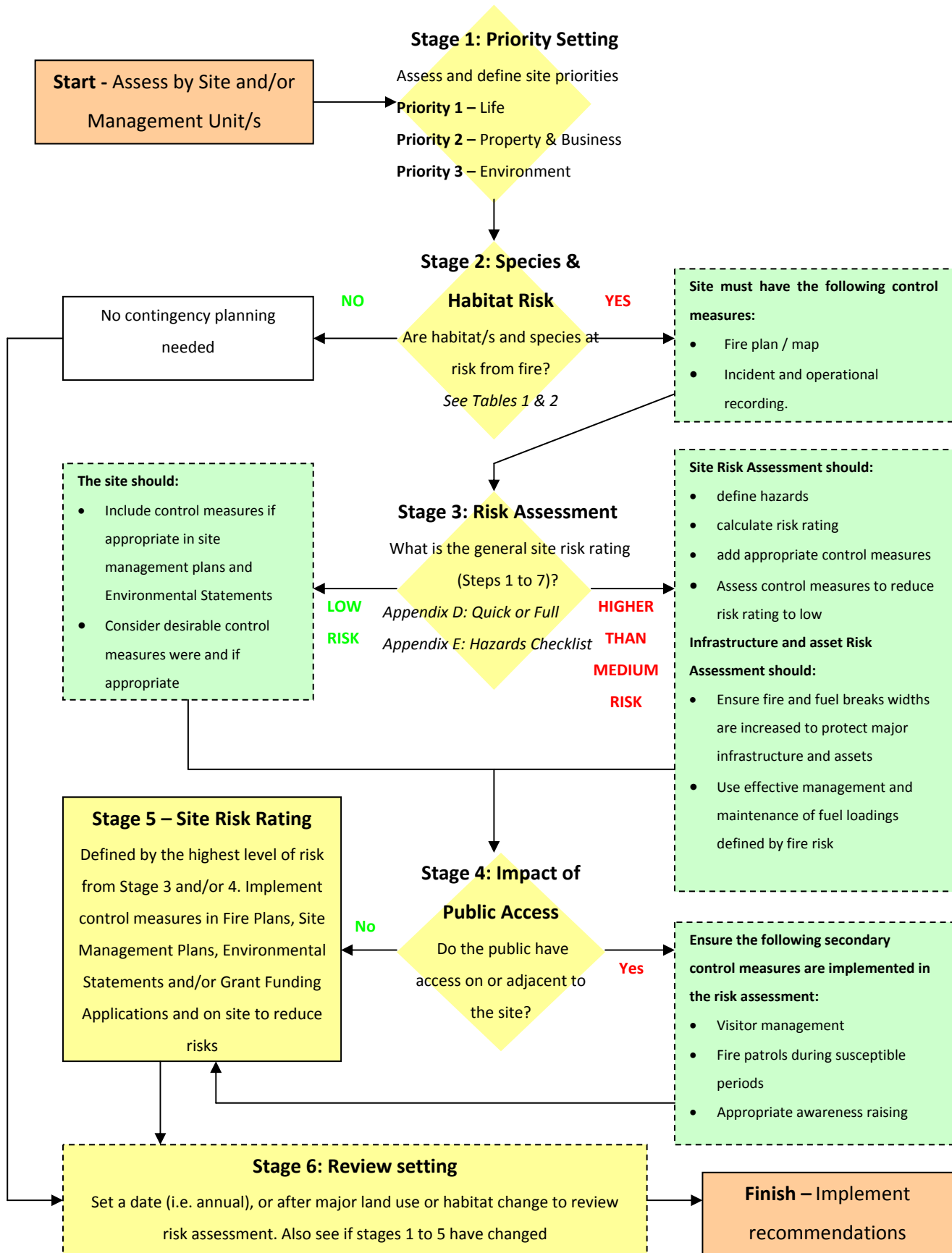
Stage 5 – Site Risk Rating

Highest level of risk from Stage 3 and 4:

Stage 6 – Review setting

Date of next review:	
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APPENDIX C – RISK ANALYSIS FLOW CHART



APPENDIX D – RISK ASSESSMENT TEMPLATES

Scoping Risk Assessment

Site Name:

Date of assessment: / /

FRS Site Code:

Landowner:

6 Figure Grid Reference:

Step 1 - Hazard/s (see Appendix E)	Step 2 - Who or what can be harmed? (See Stage 1 Priorities)	Step 3 - Initial Risk			Step 4 – Additional Control measures	Step 5 - Review Risk			Step 6 – Risk Rating	
		Existing Control Measures	L	S		R	L	S		R
Site Hazards										
Site characteristics										
Climate and weather										
Management and Training										
Land management practices										
Land management activities										
Other hazard:										
Infrastructure and Assets Hazards										
Risk to Buildings										
Risk to Transport										
Risk to Wayleaves										
Risk to Environment assets										
Risk to Social assets										
Risk to Economic assets										

Step 7 - Review date: / /

APPENDIX E – HAZARD CHECKLIST

Site Hazards

Risk	Hazard	Description	Yes
Site characteristics	Potential for larger than medium scale wildfires	Site is over a hectare and/or there is sufficient surrounding area to cause a larger wildfire	<input type="checkbox"/>
	Possibility of wildfires from adjacent land ownership	Site is location next to species and habitats at high risk from wildfires and/or prescribed burning operations that go out of control	<input type="checkbox"/>
	Wildfires increase due to no natural protection	Is the site vulnerability increased due to a lack of natural breaks and fire belts adjacent to or within the site	<input type="checkbox"/>
	Has topographical extreme fire behaviour features	Site has topographical features (i.e. gullies, valleys or slopes) that increase the potential for extreme fire behaviour	<input type="checkbox"/>
	Unexploded ordnance (UXO)	Evidence or suspected evidence of unexploded ordnance on site	<input type="checkbox"/>
	Poor accessibility for fire response	Site has poor access from the highway and/or has limited internal roads and rides and/or has restrictive off road access to aid fire fighting, orienteering and locating the fire	<input type="checkbox"/>
	Site has a heavy and/or complex fuel loading	Site has sufficient vegetation fuel loading to cause extreme fire behaviour	<input type="checkbox"/>
	Known site for deliberate and accident fires	Site has a history of past wildfires incidents (see fire reports from your local fire and rescue service and your organisations records)	<input type="checkbox"/>
Climate and weather	Exposure to weather	Site is exposed to high winds, liable to changes in direction etc.	<input type="checkbox"/>
	Increase wildfire potential due to drought and heat waves	Site has suffered a period of recent intermittent, sustained drought and/or heat waves	<input type="checkbox"/>

Risk	Hazard	Description	Yes
Management and Training	Poor fire training	Staff are not trained to respond to wildfire incidents or prescribed burning operations	<input type="checkbox"/>
	Poor level of contingency planning	Site has no risk assessment, emergency and/or fire plan and/or control measures for vegetation fires	<input type="checkbox"/>
	Poor site management planning	Site has no management plan and does it provide appropriate fire planning	<input type="checkbox"/>
Land management practices	Poor level of site management	Site is not actively / effectively managed (e.g. no vegetation management, firebreak cutting etc.)	<input type="checkbox"/>
	No planning for prescribed fires	There is no management design and operational planning for prescribed fire operations in the site management plan	<input type="checkbox"/>
	Poor potential for early detection of wildfires	There is no or limited potential for detecting wildfires by the landowner, its users or the general public	<input type="checkbox"/>
	Unmanaged site	Site has had no management undertaken for over 2 years	<input type="checkbox"/>
	Use of inappropriate management practices	Such as the use of non/minimal intervention management. in woodlands	<input type="checkbox"/>
	Poor on site prevention	Breaks and belt are not effective enough for the risks identified	<input type="checkbox"/>
Land management activities	Possible inappropriate ignition by machinery	Vehicles and equipment used for management are likely to ignite fine fuels? (i.e. inappropriate vehicles, poor guarding of exhaust, build up of fine fuels on equipment surfaces etc.)	<input type="checkbox"/>
	Poorly undertaken activities	There is poor implementation and maintenance of control measures (i.e. fire breaks)	<input type="checkbox"/>
	Use of pyrotechnics and fire setting	Pyrotechnics and/or fire used on site for activities (i.e. tracer bullets, flares, fireworks, barbecues, bonfires or brash burning)	<input type="checkbox"/>
	Inappropriate prescribed burning operations	Operation has not been appropriately planned, staff are not training, undertaken during inappropriate weather and season periods etc.	<input type="checkbox"/>

Infrastructure and Assets Hazards

Risk	Hazard	Description	Yes
Risk to buildings			
Residential, Commercial and Retail, Industrial properties	Buildings at high risk from vegetation fires	A thatched building/s is within 500m or adjacent to the site and can be impacted on by a vegetation fire?	<input type="checkbox"/>
		The building/s contain flammable / hazardous products or machinery within 500m or adjacent to the site and can be impacted on by a vegetation fire?	<input type="checkbox"/>
	Life risk from vegetation fires	The site has the potential to cause a life risk to the occupants of buildings	<input type="checkbox"/>
		The property is in close proximity to vegetation (i.e. within 10m), especially ladder fuels adjacent to the structure?	<input type="checkbox"/>
		There are vulnerable persons or people (e.g. care home, hospital and retirement home) that could be adversely impacted upon by vegetation fires (i.e. air pollution, heat radiation, evacuation and stress etc.)?	<input type="checkbox"/>
	Evacuation	Would a vegetation fire result in an evacuation of people from adjacent buildings?	<input type="checkbox"/>
	Disruption of commercial and/or industrial businesses	The site has the potential to disrupt commercial or industrial businesses through a vegetation fire?	<input type="checkbox"/>
	Impact on food and tree crops	A vegetation fire would impact on timber, woodfuel and food crops	<input type="checkbox"/>
	Impact on listed buildings and monuments	A vegetation fire would impact upon listed building and/or monument?	<input type="checkbox"/>

Risk	Hazard	Description	Yes
Risk to transport			
Airport	Flight Paths	A vegetation fire would have an impact on airport flight path (i.e. smoke restricting visibility)?	<input type="checkbox"/>
	Airport infrastructure	A vegetation fire would have an impact on airport infrastructure (e.g. hangers, fuel tanks, runway lighting)?	<input type="checkbox"/>
Road classes and infrastructure	Adjacent road part of the strategic road network	Fire or smoke would impact on Motorway and/or Truck Main road - A Road (T) adjacent too or within 500m of the site that could cause congestion?	<input type="checkbox"/>
	Adjacent road not part of the strategic road network	Fire or smoke would impact on Non-Truck Main road - A Road and/or Secondary road (B road) adjacent too or within 500m of the site that could cause congestion?	<input type="checkbox"/>
	History of smoke and/or fire impact on road classes	There are records or reports of vegetation fires adjacent to road classes	<input type="checkbox"/>
	Adjacent to road side services and amenities	Fire or smoke would impact on service area or petrol stations adjacent to or within 500m of the site?	<input type="checkbox"/>
	Smoke and/or fire reducing road users and service providers visibility	Fire or smoke would impact on roadside furniture (e.g. Message / Sign Gantry (variable message sign), CCTV cameras, road lightning etc.) adjacent to or within 500m of the site.	<input type="checkbox"/>
Train infrastructure	Adjacent train lines part of the rail network	The site is adjacent to or within 500m of the rail network.	<input type="checkbox"/>
	Smoke and/or fire reducing train driver visibility	The site adjacent to or within 500m of roadside furniture E.g. Message / Sign Gantry (variable message sign), CCTV cameras, lightning etc.	<input type="checkbox"/>

Risk	Hazard	Description	Yes
Risk to transport (continued)			
General road and train infrastructure hazards	Extreme fire behaviour due to embankments	A fire would exhibit extreme fire behaviour adjacent to or within 500m of embankments	<input type="checkbox"/>
	Smoke and/or fire restricting vision or damaging structures	Fire and smoke impact on structures (e.g. bridges, barriers, underpasses, acoustic barrier, fences, surface cabling etc.) adjacent to or within 500m of the site.	<input type="checkbox"/>
Strategic impacts	Delaying FRS	A vegetation fire (i.e. smoke and/or fire) would delay FRS response to incidents.	<input type="checkbox"/>
Impact on wayleaves			
Underground and Overground Wayleaves	Vegetation fire would have an impact on powerlines	Fire, smoke and water media fire suppression would have an impact upon powerlines	<input type="checkbox"/>
	Vegetation fire would have an impact on communication	Fire, smoke and water media fire suppression would have an impact upon communications	<input type="checkbox"/>
	Vegetation fire would have an impact on petrol lines	Fire, smoke and fire suppression would have an impact upon petrol lines	<input type="checkbox"/>
	Vegetation fire would have an impact on sewers	Fire, smoke and fire suppression would have an impact upon sewers	<input type="checkbox"/>
	Vegetation fire would have an impact on water catchment areas	Runoff from a fire or fire suppression would adversely impact upon water quality from a water catchment areas (i.e. near reservoirs or Environment Agency defined zones)	<input type="checkbox"/>
	Vegetation fire would have an impact on water pipes	Fire, smoke and fire suppression would have an impact upon water pipes?	<input type="checkbox"/>
	Vegetation fire would have an impact on wayleave infrastructure	Fire, smoke and fire suppression would have an impact on wayleave infrastructure, such as sub stations, maintenance buildings etc.?	<input type="checkbox"/>

Risk	Hazard	Description	Yes
Risk to social assets			
Recreation and Leisure	Public access	Is the site accessible by the public, especially during bank and school holidays (especially spring and summer)?	<input type="checkbox"/>
	Level of public access	Are there more than 10,000 visitors a year to the site?	<input type="checkbox"/>
	Accessibility	Does the site have Public Rights of Way (PRoW) adjacent too or across it?	<input type="checkbox"/>
		Does Open Access Land (CRoW) or permissive access increase site risk?	<input type="checkbox"/>
Cultural heritage	Heritage designations	Is there a risk to ancient monuments?	<input type="checkbox"/>
Aesthetic value	Landscape character	Is there a risk to National Park/s or Area of Outstanding Natural Beauty (AONB)?	<input type="checkbox"/>
Health and wellbeing	Evacuation	Is there a risk of evacuation from adjacent properties?	<input type="checkbox"/>
	Health	Is there a risk of ash/smoke causing respiratory illnesses (onsite and within 1km)?	<input type="checkbox"/>
Risk to economic assets			
Impact on Economic Assets	Impact on sustainable natural resources	Would a fire impact on site food, timber and biofuel products as well as wind turbines/farms etc.?	<input type="checkbox"/>
	Impact on sporting	Would a fire impact on sporting benefits?	<input type="checkbox"/>
	Impact on tourism	Would a fire impact on tourism benefits?	<input type="checkbox"/>
	Impact on neighbouring assets?	Would a fire have an impact upon neighbouring economic assets?	<input type="checkbox"/>
Risk to environmental assets			
Nature conservation	Impact on conservation, landscape and heritage assets?	Would fire impact on nature conservation, landscape and heritage designations (i.e. SSSI, SPA, SAC, Ramsar and SAM)?	<input type="checkbox"/>
Priority Habitats and Species	Impact on priority species and habitats?	Would fire impact on Priority Habitats and Species?	<input type="checkbox"/>

APPENDIX H – FIRE MAP DETAILS

Logistics and communications i.e. main roads, two and four-wheel drive route, dead ends, hard standing etc.

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Habitat risk rating – i.e. Using Tables 1 and 2 provided in the toolkit define a simple, clear and intuitive system to define to risk presented by habitats and species e.g.:

Young Conifer Plantation	= Dark green solid fill	= High Risk
Other Conifer Plantation	= Dark green hatched fill	= Low Risk
Broadleaved Woodland	= Light green hatched	= Low Risk
Lowland heath	= Purple solid fill	= High Risk

Site hazards and risk Site hazards i.e. slope, valleys, exposure to weather, drought sensitive, effectiveness of land management and operations.

factors – Risk factors i.e. major infrastructure (transport, property and under/over ground wayleaves), and assets (environmental, social and economic) etc.

Spatially these hazards can be either or a combination of area, linear and point hazards (e.g. Unexploded Ordnance (UXO), power lines/pylons electric sub stations etc.).

Orientation features – i.e. local place names, numbered or referenced access points (AP) and rendezvous points (RVP), referenced orientation bollards etc.

Water supplies – i.e. hydrants, open water, rivers, streams and emergency supplies etc.

Site and land owner details – i.e. duty officer contact details, site details, important warning notices (e.g. UXO, grazing livestock) etc.

Map legend - i.e. the relevant items listed above, map scales (miles, kilometres and hectares), Ordnance Survey grid references (six figure), site reference names number, date of map etc.

GLOSSARY AND ABBREVIATIONS

Contingency planning	A pre-established plan to mitigate an unusual situation which has the potential for harm, which incorporates the best use of local as well as remote facilities and resources.
Contingency phases	The four contingency phases are preparedness, prevention, response and recovery.
Control measures	An intervention technique to reduce risk. This could include the use of PPE, specialist equipment, working practices etc.
Duty of care	Health and Safety at Work Act 1974 and its regulations and the Occupiers Liability Act 1957 and 1984. A common duty of care is a duty to take such care as in all the circumstances of the case is reasonably safe in using the premises for the purposes for which he is invited or permitted to be there.
Emergency	An event or situation which threatens serious damage to human welfare in a place in the UK, the environment of a place in the UK, or the security of the UK or of a place in the UK.
Environmental Impact Assessment (EIA)	EIA's main aim is to ensure that the authority giving the primary consent (the competent authority i.e. Forestry Commission England) for a particular project makes its decisions in the knowledge of any likely significant effects on the environment.
Fire Suppression	All the work and activities connected with fire-extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.
Harm	This includes death, physical or mental ill health, damage to property, loss of production/service, or any combination of these.
Hazard	Something with the potential to cause harm (1). Accidental or naturally occurring (i.e., nonmalicious) event or situation with the potential to cause death or physical or psychological harm, damage or losses to property, and/or disruption to the environment and/or to economic, social and political structures.
Impact	The scale of the consequences of a hazard, threat or emergency expressed in terms of a reduction in human welfare, damage to the environment and loss of security.

Incident	Event or situation that requires a response from the emergency services or other responders Note: emergency (or major incident) refers to a specific type of incident requiring special deployment by one or more category 1 responder.
Likelihood	Chance of something happening, whether defined, measured or estimated objectively or subjectively, or in terms of general descriptors (such as rare, unlikely, almost certain), frequencies or mathematical probabilities.
Major Incident	Event or situation requiring a response under one or more of the emergency services' major incident plans.
Multiagency	Involving the participation of several agencies Note: frequently used interchangeably with interagency or joint-agency.
Preparedness	Process of preparing to deal with known risks and unforeseen events or situations that may have the potential to result in an emergency.
Preparedness phase	Ongoing phase focussed on preparedness for emergencies and disasters.
Prescribed burning	Controlled application of fire to vegetation in either their natural or modified state, under specified environmental conditions which allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to attain planned resource management objectives (prescribed fire). Please note this term has replaced the earlier term "Controlled Burning".
Prevention	Actions to avoid an incident, to intervene for the purpose of stopping an incident from occurring, or to mitigate an incident's effect to protect life and property. Includes measures designed to mitigate damage by reducing or eliminating risks to persons or property, lessening the potential effects or consequences of an incident
Recovery	Process of rebuilding, restoring and rehabilitating the community following an emergency or disaster , continuing until the disruption has been rectified, demands on services have been returned to normal levels, and the needs of those affected have been met.

Recovery phase	Phase focussed on recovery, commencing at the earliest opportunity following the onset of an emergency, and running in tandem with the response phase.
Response	Decisions and actions taken in accordance with the strategic, tactical and operational objectives defined by emergency responders. At a high level these will be to protect life, contain and mitigate the impacts of the emergency and create the conditions for a return to normality. See also preparedness and recovery .
Response phase	Phase in which decision making and actions are focused on response to an actual emergency or disaster.
Risk	A measure of the likelihood that the harm from a particular hazard will occur, taking into account the possible severity of the harm.
Risk Management	The process of analysing the level of risk, considering those in danger, and evaluating whether hazards are adequately controlled, taking into account any existing control measures.
Risk Assessment	A careful consideration by competent people of the hazard associated with a task. The potential effect of each hazard, how severe it might be and the likelihood of its occurring, should be considered to determine the effort required to make the work site as safe as reasonably possible.
Severity	Measure of the possible consequences of the hazard .
Site Management Plans	The long-term planning of land uses. Ideally planning integrates a range of site constraints including, but not exclusive to: recreation and access, biodiversity, heritage, landscape, crop production etc.
Vegetation Fires	A fires that uses vegetation as the main fuel source. Includes wildfire incidents and prescribed burning, as well as the use of suppression fires.
Wildfire	Any unplanned and uncontrolled fire which regardless of ignition source may require suppression response, or other action according to agency policy.