The causes and prevention of wildfire on heathlands and peatlands in England (NEER014)

Appendix 7: Forestry Commission wildfire management planning guidance

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NATURAL ENGLAND

Appendix 7. Forestry Commission wildfire management planning guidance

Introduction

The information in this appendix is taken by permission from:

- Forestry Commission Operations Note 040. 2019. *Assessment of potential wildfire risk resulting from planned deforestation to an open habitat*.
- Forestry Commission. 2014. *Building wildfire resilience into forest management planning*. Forestry Commission Practice Guide. Edinburgh: Forestry Commission.

This information is presented to sign-post examples of good practice and is not intended to replace the original source documents which should be consulted prior to using these templates and decision-making guidance.

Minimum requirements for wildfire planning

Toolkits required	For EIA Screening	For EIA Environmental Statement	FC Practice Guide
Wildfire Risk Assessment (WRA)	A Wildfire Risk Assessment (WRA) is required to identify: • Present hazards • Post proposal hazards (no mitigation or control measures, or • Post proposal hazards (with mitigation and control measures) The WRA will define the level of risk and will ensure mitigation and control measures avoid significant negative impacts to Environmental Factors.	As for EIA Screening, and in addition: • (Minimum requirement) The WRA will be reviewed and updated at least every 5 years, or after further land use change, operational activity or a wildfire incident.	See Appendix 1
Wildfire Management Zones (WMZ)	(Minimum requirement) A completed WMZ plan and WRP to be agreed, and for it to be updated at least every 5 years, or after land use change or significant operational activity. To be provided in a format suitable for the relevant Fire and Rescue Authority use.		See Appendix 2
Wildfire Response Plan (WRP)			See Appendix 3
Wildfire management techniques	To be provided as part of an Environmental Statement. This will identify and clearly state management techniques for wildfire mitigation and adaptation. Management techniques should be integrated within wider site management practices.		Pages 19 to 34

Wildfire risk assessment

A wildfire risk assessment is an evaluation of the likelihood of a wildfire occurring and the severity of damage it might cause if it does occur. The level of detail required will be proportionate to the level of risk and will depend on the nature and extent of the forest or woodland and the type of operations involved. The assessment may be a broad scale, map-based exercise for large forest areas, or a more detailed matrix-based approach for small woodlands at very high risk.

If required, it is possible to quantify wildfire risk using the formula: 'Risk = Likelihood x Severity' and the descriptions and scales in the tables below.

Likelihood of wildfire starting

Scale	Likelihood	Chance (%)	Description
1	Very unlikely	0-20	Event may occur in exceptional circumstances
2	Unlikely	21-40	Event could occur at some time
3	Moderate	41-60	Event will occur at some time
4	Likely	61-80	Event could occur in most circumstances
5	Very likely	81-100	Event will occur in most circumstances

Severity of a wildfire

Scale	Severity	Chance (%)		Description
1	Negligible	0.005	Life	Minor local first aid treatment (e.g. minor cuts / abrasions)
			Property / Business	No financial loss or damage
			Environment	Minor damage - habitats and species will recover in less than a year
2	Minor	0.05	Life	Injury requiring first aid treatment
			Property / Business	Minor financial losses (up to 1% of profit), disruption or damage
			Environment	Minor damage - habitats and species will recover in 1 - 5 years
3	Serious	0.5	Life	Medical treatment required
			Property / Business	Serious financial losses (up to 5% of profit), disruption or damage
			Environment	Serious damage - habitats and species will recover in 5 - 10 years
4	Major	5	Life	Permeant or life changing injuries
			Property / Business	Major financial losses (up to 10% of profit), disruption or damage
			Environment	Major damage - habitats and species will recover in 10 - 20 years
5	Fatalities	50	Life	Single or multiple deaths
			Property / Business	Destruction of property (total loss) or business
			Environment	Irreversible impact on habitats and species

The Wildfire Risk (Low, Moderate, High or Unacceptable) can be calculated using the matrix below

Severity \ Likelihood	1	2	3	4	5
1	1	2	3	4	5
2	2	4	5	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

Score	Rating	Threat
1 - 5	Risk rating 1	Low
6 - 10	Risk rating 2	Moderate
12 - 16	Risk rating 3	High
20 - 25	Risk rating 4	Unacceptable

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:	

Wildfire 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: /   /

Full 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	

Step 7 - Review date: /   /

Wildfire Hazard Checklist

Site Hazards

Risk	Hazard	Description	Yes	No
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	☐	☐
	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	☐	☐
	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	☐	☐
	Has topographical extreme fire behaviour features	Site has topographical features (i.e. gullies, valleys or slopes) that increase the potential for extreme fire behaviour	☐	☐
	Unexploded ordnance (UXO)	Evidence or suspected evidence of unexploded ordnance on site	☐	☐
	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	☐	☐
	Site has a heavy and/or complex fuel loading	Site has sufficient vegetation fuel loading to cause extreme fire behaviour	☐	☐
	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)	☐	☐
Climate and weather	Exposure to weather	Site is exposed to high winds, liable to changes in direction etc.	☐	☐
	Increase wildfire potential due to drought and heat waves	Site has suffered a period of recent intermittent, sustained drought and/or heat waves	☐	☐

Risk	Hazard	Description	Yes	No
Management and Training	Poor fire training	Staff are not trained to respond to wildfire incidents or prescribed burning operations	☐	☐
	Poor level of contingency planning	Site has no risk assessment, emergency and/or fire plan and/or control measures for vegetation fires	☐	☐
	Poor site management planning	Site has no management plan and does not provide appropriate fire planning	☐	☐
Land management practices	Poor level of site management	Site is not actively / effectively managed (e.g. no vegetation management, firebreak cutting etc.)	☐	☐
	No planning for prescribed fires	There is no management design and operational planning for prescribed fire operations in the site management plan	☐	☐
	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	☐	☐
	Unmanaged site	Site has had no management undertaken for over 2 years	☐	☐
	Use of inappropriate management practices	Such as the use of non/minimal intervention management. in woodlands	☐	☐
	Poor on site prevention	Breaks and belt are not effective enough for the risks identified	☐	☐
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.)	☐	☐
	Poorly undertaken activities	There is poor implementation and maintenance of control measures (i.e. fire breaks)	☐	☐
	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)	☐	☐
	Inappropriate prescribed burning operations	Operation has not been appropriately planned, staff are not training, undertaken during inappropriate weather and season periods etc.	☐	☐

Infrastructure and Assets Hazards

Risk *Hazard*		Description	Yes	No
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?	☐	☐
		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?	☐	☐
	Life risk from vegetation fires	The site has the potential to cause a life risk to the occupants of buildings	☐	☐
		The property is in close proximity to vegetation (i.e. within 10m), especially ladder fuels adjacent to the structure?	☐	☐
		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.)?	☐	☐
	Evacuation	Would a vegetation fire result in an evacuation of people from adjacent buildings?	☐	☐
	Disruption of commercial and/or industrial businesses	The site has the potential to disrupt commercial or industrial businesses through a vegetation fire?	☐	☐
	Impact on food and tree crops	A vegetation fire would impact on timber, woodfuel and food crops	☐	☐
	Impact on listed buildings and monuments	A vegetation fire would impact upon listed building and/or monument?	☐	☐

Risk	Hazard	Description	Yes	NO
Risk to transport				
Airport	Flight Paths	A vegetation fire would have an impact on airport flight path (i.e. smoke restricting visibility)?	☐	☐
	Airport infrastructure	A vegetation fire would have an impact on airport infrastructure (e.g. hangers, fuel tanks, runway lighting)?	☐	☐
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 to or within 500m of the site that could cause congestion?	☐	☐
	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?	☐	☐
	History of smoke and/or fire impact on road classes	There are records or reports of vegetation fires adjacent to road classes (i.e. Motorway, A or B roads)	☐	☐
	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?	☐	☐
	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.	☐	☐
Railway infrastructure	Adjacent train lines part of the rail network	The site is adjacent to or within 500m of the rail network.	☐	☐
	Smoke and/or fire reducing train driver visibility	The site adjacent to or within 500m of railside furniture/infrastructure E.g. Message / Sign Gantry (variable message sign), CCTV cameras, lightning etc.	☐	☐

Risk	*Hazard*	Description	Yes	No
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	☐	☐
	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.	☐	☐
Strategic impacts	Delaying FRS	A vegetation fire (i.e. smoke and/or fire) would delay FRS response to incidents.	☐	☐
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	☐	☐
	Vegetation fire would have an impact on communication	Fire, smoke and water media fire suppression would have an impact upon communications	☐	☐
	Vegetation fire would have an impact on petrol lines	Fire, smoke and fire suppression would have an impact upon petrol lines	☐	☐
	Vegetation fire would have an impact on sewers	Fire, smoke and fire suppression would have an impact upon sewers	☐	☐
	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)	☐	☐
	Vegetation fire would have an impact on water pipes	Fire, smoke and fire suppression would have an impact upon water pipes?	☐	☐
	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.?	☐	☐

Risk	Hazard	Description	Yes	No
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)?	☐	☐
	Level of public access	Are there more than 10,000 visitors a year to the site?	☐	☐
	Accessibility	Does the site have Public Rights of Way (PRoW) adjacent too or across it?	☐	☐
		Does Open Access Land (CRoW) or permissive access increase site risk?	☐	☐
Cultural heritage	Heritage designations	Is there a risk to ancient monuments?	☐	☐
Aesthetic value	Landscape character	Is there a risk to National Park/s or Area of Outstanding Natural Beauty (AONB)?	☐	☐
Health and wellbeing	Evacuation	Is there a risk of evacuation from adjacent properties?	☐	☐
	Health	Is there a risk of ash/smoke causing respiratory illnesses (onsite and within 1km)?	☐	☐
Risk to economic assets				
Impact on Economic Assets	Impact on sustainable natural resources	Would a fire impact on site food, timber and biofuel products and/or wind turbines/farms etc.?	☐	☐
	Impact on sporting	Would a fire impact on sporting benefits?	☐	☐
	Impact on tourism	Would a fire impact on tourism benefits?	☐	☐
	Impact on neighbouring assets?	Would a fire have an impact upon neighbouring economic assets?	☐	☐
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)?	☐	☐
Priority Habitats and Species	Impact on priority species and habitats?	Would fire impact on Priority Habitats and Species?	☐	☐

Example wildfire risk assessment

What are the fire hazards?	Who/What might be harmed and how?	What are you already doing to manage risk?	Initial risk rating			What else do you need to do?	Revised risk rating		
			L	S	R		L	S	R
Wildfire could adversely impact upon the SSSI and SAC as well as the protected species	Wildlife	• Partnership working with Fire and Rescue Service including development of Wildfire Response Plan.	4	4	16 High	• Heathland across the site, including the area of woodland removal, will be managed to create a dynamic mosaic of age classes and structures to reduce the risk of extreme fire behaviour through mechanical cutting and prescribed burning operations linked to strategically located fire and fuel breaks and other prevention features (e.g. actively managed woodlands) • Wildfire Management Plan will be integrated in the Site Management Plan to ensure that wildfire risk is fully considered in management to protect SSSI, SPA and protected species	3	3	9 Moderate

Hazard	Who is at risk	Control measures	L	S	Risk	Further control measures	L	S	Residual Risk
Risk of ignition of wildfires and fire spread from bonfires/barbecues set on site.	Staff/public/fire fighters	• No bonfires during dry spells, water containers taken if burning up. • Bonfire sites clear of debris and at a safe distance from scrub and trees • Do not light bonfires during excessively high winds	2	3	6 Moderate				
Injury and fatalities resulting from wildfires on site.	Staff/public/fire fighters	• Visitor notices about wildfire risk have been located at entrance points during periods of high risk • Staff have received wildfire response training and have had joint training exercises with Fire and Rescue Service	1	5	5 Low				
Electrocution by 33kv overhead power lines during response to wildfire due to smoke and water media firefighting techniques.	Staff/public/fire fighters	• Powerlines are clearly marked on the Wildfire Response Plan • Staff will inform Fire and Rescue Service the site has overhead powerlines • Vegetation under powerlines is managed by Electricity contractors on a regular basis	2	3	6 Moderate	• Wildfire Management Plan includes strategic vegetation management to reduce the risk to extreme fire behaviour	2	2	4 Low
Wildfire affecting adjacent oil wells managed by private company	Oil Company Staff/fire fighters/public	• Oil wells clearly marked on the Wildfire Response Plan	4	5	20 Unacceptable	• 30m broadleaved woodland will be retained along the boundary adjacent to the oil wells and will be actively managed to increase resilience • Wildfire Management Plan will include strategic vegetation management to reduce the risk to extreme fire behaviour near oil wells	2	5	10 Moderate

Hazard	Who is at risk	Control measures	L	S	Risk	Further control measures	L	S	Residual Risk
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			L	S	Risk		L	S	Risk
Are there more than 10,000 visitors a year to the site?	Staff/public/fire fighters	• Notices are put up warning of the dangers of fires during dryer months • Fire and Rescue Service was liaised with to ensure adequate planning and cooperation in the case of a wildfire • Lighting of fires/ barbecues by members of the public is strictly prohibited on the site.	3	4	12 High	• Fire safety will be incorporated into the next site information day	2	3	6 Moderate
The site is accessible by the public, especially during bank and school holidays (especially spring and summer)	Staff/public/fire fighters	• Notices are put up warning of the dangers of fires during dryer months • Lighting of fires/ barbecues by members of the public is strictly prohibited on the site	2	2	4 Low				
The site is open access land with PRoW crossing it in a number of places	Staff/public/fire fighters	• Notices are put up warning of the dangers of fires during dryer months • Lighting of fires/ barbecues by members of the public is strictly prohibited on the site	2	2	4 Low				
Site is over a hectare and/or there is sufficient surrounding area to cause a larger wildfire	Staff/public/fire fighters	• Main firebreak splits the site as well as a number of wide rides and will be cut annually • The overall coverage of gorse / herbaceous vegetation will be reduced by up to 80%	2	3	6 Moderate				

Stakeholders for wildfire planning

In order to inform a project or EIA opinion, the following stakeholder organisations and groups should be considered when seeking views and gathering evidence:

- Fire and Rescue Services (who are acting on behalf of the Fire and Rescue Authority)

- Local Authority/s (the Emergency Planning Officer) who will advise on their 'Community Risk Register', which will define the level of wildfire risk and state control measures

- Representatives of Local Wildfire Groups, where they exist

- Adjacent landowners and/or land managers, including tenants

- Adjacent residential and business property owners

- Owners of national infrastructure or other assets that could be adversely impacted upon by a wildfire from/to the site (e.g. Highways England, Utility Companies, Airport companies, National Health Service, Network Rail, etc.)

- Representative/s of the Local Resilience Forums, defined by its chairperson, using their Community Risk Register to define wildfire risk and control measures in hazard 'H58 Severe Wildfire'. Not all LRFs hold information on wildfire

Wildfire Response Plan

Wildfire response plans provide vital information to the fire and rescue services and other responders in the event of a wildfire incident. This appendix sets out the information that should be included in the response plan, which should include a fire map to illustrate key locations and other geographical information. Fire maps are usually produced at 1:10 000 scale and use the standard symbols set out below*. The information provided in the response plan will be used by the fire and rescue services to develop their own plans for use in the event of a wildfire incident.

As well as the name of the site, the plan should contain the contact details of all the people that may be required to provide information, make decisions or offer assistance in the event of an incident including:

- Key contact (forest or woodland owner or manager)
- Insurance company
- Fire and rescue service wildfire liaison officer
- Trained forestry contractors.

The availability and location of fire-fighting and forestry equipment that might be of use in responding to a wildfire incident should also be listed in the plan.
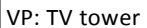
> ⓘ
> Wildfire response plans should be regularly reviewed to ensure they accurately represent what exists on the ground. Operations such as felling and thinning will affect vegetation structure and fuel loadings.

Fire map information and standard symbols

Access and communications

API

Access points to the forest/woodland from the main road and key locations in the forest/woodland that provide the best access to the main road/ride network.

Forest roads/tracks that can be used by fire appliances.
Forest tracks that can be used by off-road vehicles.
Forest tracks that can be used by all-terrain vehicles.

Passing place/hardstanding (solid black rectangle); turning point (open circle); dead end (solid black circle).

W

Areas where radio and mobile phone communication are not possible due to poor signal.

Signage and orientation features

Orientation points.
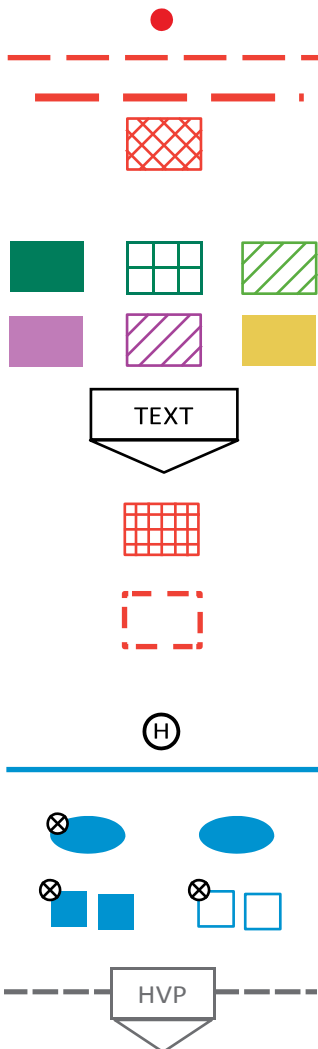Local landmarks.

'The Warren'

VP: TV tower

Vantage points.

Assembly/rendezvous points

Locations that can accommodate vehicles and fire appliances without obstructing access. Ideally this should be hardstanding on the main forest road/ride network that can be used by the fire and rescue services for:

- Marshalling areas (e.g. car parks that can support a large number of vehicles).
- Harbour areas (e.g. areas that provide room for at least six fire appliances).
- Staging areas (e.g. areas that provide room for at least four fire appliances).

*Note that not all of the fire map symbols apply to Northern Ireland.

Site hazards

Point hazard features (e.g. sub-stations).

Linear overground features (e.g. power lines).

Linear underground features (e.g. fuel pipelines).

Area features (e.g. areas of unexploded ordnance or boggy mires unsuitable for vehicle access).

Fuel hazards

High-risk conifer (dark green solid); low-risk conifer (dark green cross-hatch); broadleaves (light green hatch). High-risk heathland (purple solid); low-risk heathland (purple hatch); grassland (yellow solid).

Priority protection areas

Buildings and other assets.

Designated sites.

Sacrificial areas. Areas that could be sacrificed to protect priority features.
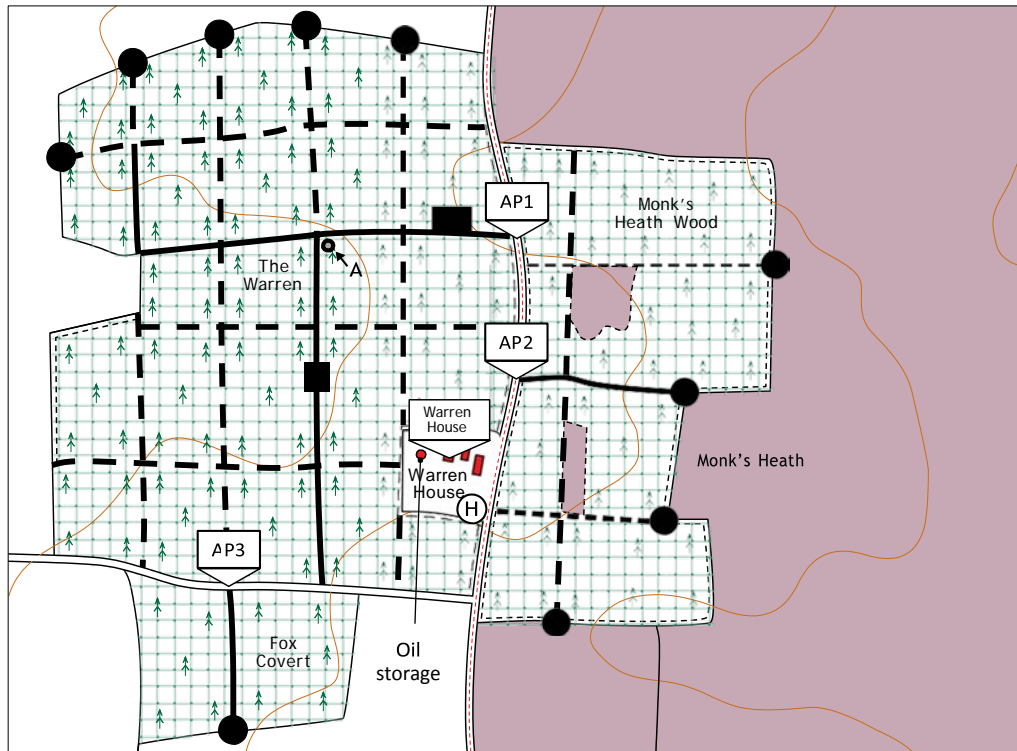
Water supplies

Hydrants.

Rivers and streams.

Lakes and fire ponds (with and without helicopter access).

Fire-dams: permanent (with/without helicopter access); temporary (with/without helicopter access).

High-volume pump/hose network.

An example fire map for the wildfire response plan.

Natural England is here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations.

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