Your peat fire management summary

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Name of peatland: _____
Name of assessor: _____
Assessment date: _____ / _____ / _____

Report

Thank you for completing the tool for managing peat fires in South Africa.
This report summarises your responses, highlighting the issues you identified and where further action is needed.

Your responses

Question	Your answer	What this means / key actions
Do you suspect there is a subsurface peat fire?	Yes	You suspect a subsurface peat fire. This tool can help you identify possible interventions.

Intervention 1: Controlled dam release

Question	Your answer	What this means / key actions
Is there an impoundment [dam] upstream of the peatland from which controlled water releases can be made?	Yes	Controlled releases from an upstream dam may be an option for extinguishing this peat fire.
Question	**Your answer**	**What this means / key actions**
Will the release be effective in rewetting the peatland?	Yes	For a government-owned dam, contact the responsible authority (e.g. the municipality, water board or Department of Water and Sanitation) to request emergency water releases. For a farm dam, contact the landowner for assistance. If the dam has no outlet for controlled releases, consider whether water can be transferred using a large hose or pump. Release sufficient water to saturate the affected peat and extinguish the fire. Releases should be gradual to allow water to soak into the peatland while minimising erosion.

Intervention 2: Spike tool

Question	Your answer	What this means / key actions
Is there water available to supply a spike tool?	No	A spike tool cannot be used to extinguish this peat fire without a suitable water supply.

Question	Your answer	What this means / key actions

Is there a spike tool available?	Yes	A spike tool is available for use, either from your own equipment or on loan. How to use the spike tool Connect the spike tool to a hose, using either portable suction pumps drawing water from a river or dam portable pools or a water tanker. Insert the spike tool along the burn edge to contain the fire by irrigating the subsurface layers and preventing its spread. Then, progress toward the centre of the fire in grid formation to extinguish it. Setting up a grid to systematically extinguish peat fires Set up a 1 Ã— 1 m grid over the section of peatland you are extinguishing. If it is safe to enter, use rope or any available material to mark out the cells, and copy the grid onto paper or an appropriate app. Start in one cell (such as the bottom-left) and extinguish the fire completely before moving to an adjacent cell. Mark each cell as completed on your map or in the field to ensure you cover the entire area without missing or repeating any sections. Tips for extinguishing a peat fire using a spike tool • Consider using 2-3 spike tools for a medium-sized (>1 ha) subsurface peat fire. • A team of at least 2-3 people per spike tool is required to rotate roles of pumping, safety precautions, inserting the tool, stabilization. • Within each cell, insert the spike tool at roughly 30 - 50 cm intervals, keeping it in place and continuously applying water long enough for that spot to extinguish. • The amount of time that water should be applied at one spot can vary widely between peatlands, sometimes up to 30 minutes, depending on fire depth. • Use a thermal camera (detection to 0.5 m below ground) and metal poles (carefully feeling for heat) to confirm extinguishment before moving on. A rough indicator is when smoke ceases to emerge from a point during water application. • Consider placing the spike tool upslope of the fire to maximize water infiltration through the affected peatland layers following irrigation. If applied lower in the system, there is a risk that water will quickly drain back into a river channel, thereby reducing its effectiveness in wetting peat layers. • Work upwind of the peat fire to minimize inhalation of fumes. • Appoint a designated "spotter" who flies the drone each morning and maps areas of concern (e.g. areas of high temperature) • Cordon off high risk areas. • Use farm gates or wooden palettes to stand on, and insert the spike tool through the gaps in the palettes or gates. For more information, consult: PEAT INFO SHEET 3:

Identifying and extinguishing peat fires.

Intervention 3: Hand auguring

Question	Your answer	What this means / key actions
Is the peat fire relatively small?	Yes	This method may be suitable for extinguishing a peat fire of this size. How to use hand-augering to extinguish the peat fire This approach requires hand auguring holes and inserting water with a hose (or using more standard, surface fire-fighting equipment to insert water into holes). Hand augering is a manual technique used to collect soil or peat samples by drilling a narrow, spiral-shaped tool (an auger) into the ground. The auger is turned by hand to penetrate the soil or peat layer. Once the hole has been made, insert a hosepipe into it and pump water from a water tanker or another imported water source to saturate the subsurface. In terms of a strategy, start the process just outside of the burn edge and work your way in towards the centre of the fire until it is extinguished using a grid approach if helpful. Setting up a grid to systematically extinguish peat fires Set up a 1 Ã— 1 m grid over the section of peatland you are extinguishing. If it is safe to enter, use rope or any available material to mark out the cells, and copy the grid onto paper or an appropriate app. Start in one cell (such as the bottom-left) and extinguish the fire completely before moving to an adjacent cell. Mark each cell as completed on your map or in the field to ensure you cover the entire area without missing or repeating any sections.

Intervention 4: Trench digging

If you do not have an impoundment upstream, a large water source, or access to a spike tool, and the peat fire is relatively large, then trench digging in the peatland may be the only option.

Question	Your answer	What this means / key actions

Is the peat fire relatively small?	Yes	This method may be suitable for extinguishing a peat fire of this size. How to use hand-augering to extinguish the peat fire This approach requires hand auguring holes and inserting water with a hose (or using more standard, surface fire-fighting equipment to insert water into holes). Hand augering is a manual technique used to collect soil or peat samples by drilling a narrow, spiral-shaped tool (an auger) into the ground. The auger is turned by hand to penetrate the soil or peat layer. Once the hole has been made, insert a hosepipe into it and pump water from a water tanker or another imported water source to saturate the subsurface. In terms of a strategy, start the process just outside of the burn edge and work your way in towards the centre of the fire until it is extinguished using a grid approach if helpful. Setting up a grid to systematically extinguish peat fires Set up a 1 Ã— 1 m grid over the section of peatland you are extinguishing. If it is safe to enter, use rope or any available material to mark out the cells, and copy the grid onto paper or an appropriate app. Start in one cell (such as the bottom-left) and extinguish the fire completely before moving to an adjacent cell. Mark each cell as completed on your map or in the field to ensure you cover the entire area without missing or repeating any sections.
Question	**Your answer**	**What this means / key actions**
Do you want to continue exploring the trenching intervention?	No	You have chosen not to explore trenching further.

Additional Information

Guidance

Steps to take in the case of a peat fire

Action 1: Communicate

Raise the alarm so that appropriate safety precautions may be taken both as emergency response, and more medium-term considerations of the poor air quality.

Formal channels: contact your local and district fire departments (as applicable), the local Fire Protection Agency (via the FPA officer), the relevant environmental department (local and provincial government).

Key national contacts
Department of Forestry, Fisheries and the Environment (DFFE): Environmental Crimes and Incidents Hotline: 0800 205 005
Department of Water and Sanitation Hotline: 0800 200 200.
Informal channels: notify the public, e.g. local WhatsApp groups, newspapers, social media.

Action 2: Prepare

There are three steps that could be considered in terms of preparing to extinguish a peat fire:

Step 1: Take safety precautions

When entering a burning peatland, before taking each step, insert a metal rod into the ground to check for cavities, subsurface fire, or instability. This is a quick and easy motion that takes just a second but is essential for ensuring safety. It is not uncommon for people working in peat fires to step onto unstable ground and fall through into burning peat.
If there is an active peat fire, the rod will come out hot to the touch. In that case, it is not safe to step directly onto the peatland. Instead, use items like metal sheets, farm gates or wooden pallets to distribute your weight and protect against falling into the peatland upon collapse.
• Use a gas detector to assess whether an oxygen tank is required for safe entry.
• Consider using respiratory protection (such as safety masks with oxygen tanks), as peat fire smoke is often highly toxic.
• Use appropriate fire-resistant clothing and safety boots designed for hazardous environments (structural personal protective equipment).

Step 2: Assessment and reconnaissance

Determine the burn edge of the peat fire. The burn edge in a peatland can be determined in at least two ways:

Direct: A steel rod can be inserted into the peat to determine the presence and depth of the fire. Insert the rod, and withdraw it to feel its temperature.

Indirect: Drone with a mounted thermal camera. This is suitable for peat fires close to the surface (within 0.5m below the surface).

Once the burn edge has been identified, assess the extent of the fire and locate hotspots. Clearly mark the fire perimeter using spikes and danger tape at the start of operations and update these markings daily at a fixed time (e.g. each morning).

Markings should indicate:

• designated starting points for daily operations,
• areas to avoid due to hazardous conditions, and
• zones that have already been extinguished.

Step 3: Prevent the spread

Subsurface peat fires can emerge at the surface and ignite surrounding vegetation, potentially starting new surface fires in other areas, and perhaps even entering the peatland again at another location. To prevent the spread of the peat fire on the surface, it is recommended to cut firebreaks around the peatland. This helps to contain the fire. Firebreaks are especially important for peat fires, which can smoulder and burn for several months.

Action 3: Extinguish

There are at least four different potential interventions, depending on context and resource availability. These include:
• Controlled dam releases
• Firefighting using a spike tool
• Firefighting using hand-auguring
• Digging trenches

Safety Precautions

Personal Protective Equipment (PPE)

• Carry a gas detector to assess whether an oxygen tank is required for safe entry.
• Wear respiratory protection (such as safety masks with oxygen tanks), as peat fire smoke is often highly toxic.
• Use appropriate fire-resistant clothing and safety boots designed for hazardous environments (structural PPE).

Safety precautions when entering a burning peatland

Use the "step and stab" approach. Do not simply walk into a burning peatland. The ground may be burning or unstable (with burned out cavities underfoot) and could collapse, with major risk of burns. Burning peat is warm or hot to the touch. A steel rod can be inserted into the peat to determine if there is a fire far beneath the surface, and at what depth. Insert the rod and withdraw it to carefully feel its temperature. If there is an active peat fire, the rod will come out hot to the touch. In that case, it is not safe to step directly onto the peatland. instead, use metal sheets/farm gates/palettes to distribute your weight and protect against collapse. Continue to use the rod to probe the ground as you move- repeat the measurement with each step- "step and stab." Itâ€™s a quick and easy motion that takes just a second but is essential for ensuring safety.

Determine the burn edge in the peatland

The burn edge in the peatland needs to be determined to make strategic and efficient use of resources, fighting the fire where it is currently burning. But it also allows safe and unsafe zones to be demarcated and is useful for monitoring fire-fighting progress. Use a grid-approach to assess the peatland, marking out zones as the peatland is traversed. There are two possible ways to determiner he burn edge:
Direct: Use the step and stab approach described above to carefully map out the edge of the fire in the peatland
Indirect: Drone with a mounted thermal camera can be used to detect subsurface burning up to ~0.5m (but beware of errors).
A peatland expert can be called upon to assist with determining peatland depth and the depth of the fire.
Contact: ARC-NRE Soil Science: Dr Jason Le Roux (LeRouxJ@arc.agric.za) for advice.

Assessment and reconnaissance

Once the burn edge has been identified, assess the extent of the fire and locate hotspots. Clearly mark the fire perimeter using metal droppers/poles and danger tape at the start of operations and update these markings daily (each morning). Markings should indicate:

• designated starting points for daily operations,
• areas to avoid due to hazardous conditions, and
• zones that have already been extinguished.

This may also be mapped in a geographic information system (GIS).

Applicable Legislation

Fire management

• National Veld and Forest Fire Act, 101 of 1998 â€“ provides the principal legal framework for the prevention and management of veld and forest fires.

Environmental and water-resource protection

• National Environmental Management Act (NEMA), 107 of 1998 - particularly Sections 30 and 30A concerning emergency incidents and environmental harm.
• National Water Act (NWA), 36 of 1998 - particularly Sections 19, 20 and 21, where peat fires or associated activities may cause or threaten pollution or harm to water resources.

Biodiversity and invasive species

• National Environmental Management: Biodiversity Act (NEMBA), 10 of 2004 â€“ provides for the protection of biodiversity and the control of listed invasive species. The Alien and Invasive Species Regulations and associated species lists made under NEMBA are particularly relevant where invasive alien vegetation contributes to fire risk or where fire management involves the control of listed invasive species.
• Conservation of Agricultural Resources Act (CARA), 43 of 1983 â€“ includes provisions and regulations relevant to the conservation of agricultural resources, including veld fires, erosion and invasive vegetation.

Emergency Authorisation

Activities such as digging trenches and constructing firebreaks within peatlands or wetlands have legal requirements under the National Environmental Management Act (NEMA) and the National Water Act (NWA). Abstracting water for firefighting may trigger the NWA, depending on the amount of water abstracted. Peat fires constitute an environment emergency, which triggers emergency procedures. Knowing the relevant legislation and procedures is important, as there are provisions to help to fast-track authorisations in cases of emergencies. Environmental emergency responses allow rapid action while ensuring that environmental impacts are minimised and the affected peatland is rehabilitated afterwards. There are two processes to follow for emergency incidents in peatlands:
• Applying for authorisation under the NWA 36 of 1998
• Applying for authorisation under the NEMA 107 of 1998

(1) NATIONAL WATER ACT (NWA) 36 of 1998

The Department of Water and Sanitation has made provision for emergency situations like peat fires via General Notice 4167 of 2023, which replaces the need for a water user to apply for a licence in terms of section 40 of the National Water Act 36 of 1998, provided

that the water use is within the limits and conditions of this general authorisation.

An "emergency incident" is defined in Section 2 (vi) (b) as "an unexpected, sudden and uncontrolled incident or accident in which a substance of activity has causes or is likely to have, a detrimental effect on a water resource". Under Section 2 (vii) an "emergency situation" is defined as one "that has arisen suddenly that poses an eminent and serious threat to the water resource, human life or property including a disaster as defined in section 1 of the Disaster Management Act 57 of 2002". For any fire-fighting interventions in peatlands, the Department of Water and Sanitation encourages the principle that impacts should be minimised while no further harm should be caused.

What to do in case of an emergency according to GN 4167 of 2023:

• Report to the regional Department of Water and Sanitation/Catchment Management Agency (CMA) Office that there is an emergency. This may be by phone. Get telephonic confirmation of the emergency and that you will be proceeding with interventions. You may also request proof of this confirmation in writing (e.g. by email or WhatsApp). This needs to be within 24 hours, and therefore there is leeway to respond immediately to the emergency and notify the authorities later (within this period).
• Take reasonable measures to fight the peat-fire (i.e. by using the guidance of this tool to identify the most appropriate intervention, and its potential risks to minimise impacts)
• You have 14 days to submit the documents related to the incident.
• A final report on all executed activities is due within 3 months.
• Please refer to Appendix c: Emergency protocols for more details (GN 4167 of 2023).
• This process applies to cutting fire breaks, digging trenches and all other interventions applied to extinguish the peat fire.

(2) NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA) 107 of 1998

In parallel with NWA requirements, peat fires are regulated as emergency incidents under NEMA, primarily through Section 30. Section 30 places a legal duty of care on the responsible person to:
• Immediately report the emergency incident to the relevant authorities,
• Director-General (DFFE),
• The South African Police Service
• Relevant provincial head of environmental department and municipality
• All persons whose health may be affected
• Submit an initial evaluation report within 14 days to the relevant authority
• Take all reasonable measures to contain and minimise the effects of the incident, remedy the effects of the incident, including rehabilitation of the environment, and prevent recurrence of similar incidents.
• Failure to comply with these duties may result in enforcement action or liability for remediation costs.

Section 30A empowers the competent authority to:

• Issue directives requiring specific actions to manage, contain, or remediate the emergency incident, and
• Recover costs where the responsible person fails to act adequately.

Applicability of the Environmental Impact Assessment (EIA) Regulations

Emergency interventions in peatlands may trigger a listed activity of either one of the Listing Notices of the EIA Regulations, particularly where activities occur:
• Within wetlands or watercourses,
• In sensitive ecological areas, or
• In areas identified as critical biodiversity or hydrological zones.

However, NEMA allows for procedural flexibility in genuine emergency situations, provided that:

• The activity is strictly limited to addressing the emergency, and
• All post-emergency reporting, rehabilitation, and compliance requirements are fulfilled.

Applicability of Listing Notices (LN) of NEMA to Emergency Peat Fire Interventions

Emergency peat fire interventions may trigger different NEMA Listing Notices (LN) depending on scale and impact. LN1 applies to mechanical or large-scale actions, like vegetation clearance, trenching, or temporary water use. LN2 covers extensive or high-impact measures that permanently alter peatlands or hydrology. LN3 applies to sensitive areas, including wetlands and peatlands, and is triggered even by small disturbances, such as firebreaks, vegetation removal, or water diversion.

Under NEMA Section 30, urgent fire suppression can proceed without prior authorisation, if necessary, but post-incident reporting, rehabilitation, and compliance with the Duty of Care remain mandatory. Overall, emergency action is allowed but must be proportionate, justified, and followed by restoration and accountability measures.

Important contacts

- National Environmental Crimes and Incidents Hotline: 0800 205 005 (DFFE)
- Department of Water and Sanitation Hotline: 0800 200 200 (DWS)