MANAGEMENT OF WILDFIRES IN THE BUDONGO – BUGOMA LANDSCAPE

TRAINING MANUAL

Acknowledgement

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Executive summary

Wildfires continue to be one of the biggest threats to the environment because they change the ecosystem structure and interfere with ecological processes. The frequency and severity of wildfires is predicted to increase as a result of dry spells that increase the fuel load due to climate change consequently increasing wildfire risks and intensity. Wildfires cause ecosystem change, land degradation, affect supply of ecosystem services thus affecting livelihoods and public health conditions. They are a major challenge to social-ecological sustainability.

The third National Development Plan (NDPIII) acknowledges wildfires as a threat to the environment, infrastructure, cities and businesses while the National Biodiversity Strategy and Action Plan II (2015-2025) recognizes wildfires as a threat to most biodiversity rich areas in Uganda. Similarly, the National REDD+ Strategy and Action Plan identifies wildfires as one the of drivers of deforestation and forest degradation in Uganda.

One of the areas severely affected by wildfires is the Budongo – Bugoma landscape, a well-known biodiversity hot spot located in the northern part of the Albertine Rift covering the districts of Kikuube, Hoima, Masindi and Buliisa. It hosts the largest forest reserves in Uganda i.e., Budongo and Bugoma and the largest conservation area in Uganda; Murchison Falls Conservation Area. The area is dominated by grassland, bushland and woodland vegetation which are highly flammable thus increasing the risk of occurrence of wildfires.

Additionally, the landscape has received an economic boom attributed to the commercial sugarcane farming and the oil and gas activities further increasing the risks of wildfires.

With the above background, stakeholders within the Budongo-Bugoma Landscape developed a Wildfire Management Strategy for the Landscape whose vision is "A wildfire free landscape that sustains natural resources for posterity". The Strategy is hinged on the goals below;

- To reduce biodiversity and livelihood loses due to wildfires
- To improve coordination and partnerships in wildfire management
- To enhance capacity and capability in wildfire management
- To raise awareness on the dangers and impacts of wildfire

This Training Manual is a tool towards enhancing peoples' capacity and capability thus improving their response to wildfires through coordination and engagement of stakeholder thus reducing the losses caused by wildfires.

About this guide

This Training Manual provides an in-depth understanding of wildfires, causes and a step by step guide for communities to Plan, Develop and Implement a Fire Management strategy on communal, private and public lands in the landscape to reduce the risks and effects of wildfires.

The Manual is a tool developed towards fulfilling some of the strategies that were set by the stakeholders through a comprehensive stakeholder engagement in the development of the Budongo-Bugoma Landscape Wildfire Management Strategy 2025-2030. The Landscape hosts some of the Key Biodiversity Areas (KBAs) such as; the largest central forest reserves in Uganda; Budongo and Bugoma, the largest conservation area; Murchison Falls Conservation Area, Katonga Wildlife Reserve and the largest private nature forests; Itohya Forest Reserve. Additionally, the landscape is one of the fastest economically growing areas with large tracts of sugarcane plantations, tree plantations, pastoralism not forgetting oil and gas.

The landscape is faced with many challenges which stem from high population growth attributed to immigration of labour, refugees etc. Some of the challenges include; forest degradation, land clearing for agriculture, settlement, industrialization and climate change. As a result of these and more anthropogenic activities, wildfires have become a common occurrence in the landscape hence calling for an integrated approach towards their prevention and management.

Occurrence of Wildfires and their effects, now a common problem have been overlooked for the past decades in Uganda where only suppression tools were engaged. The manual and the Wildfire strategy therefore form a baseline on which useful lessons can be learned to formulate the nation-wide Wildfire Management strategy.

1.0 Introduction to Wildfires

Wildfire is an uncontrolled fire that burns causing a lot of damage to life, livelihoods and environment.

Wildfires continue to be one of the biggest threats to the environment because they change the ecosystem structure and interfere with ecological processes. The frequency and severity of wildfires is predicted to increase over the years due to climate change (Richer et al., 2006) . This is attributed to high temperatures that lead to dryer conditions and increase fuel load hence increasing fire risks and intensity (USAID, 2014) .

1.1 People's Perceptions about Fire

Traditionally fires are used for cooking, charcoal production, waste management, harvesting honey and setting up camps. Burning plays an important role in;

- **Wildfire Hazard Reduction;** Controlled burning is used to minimise the occurrence, intensity and extent of wildfires by reducing and fragmenting fire fuel loads. This decreases the available area for uncontrolled wildfires to burn later in the year.

- **Enhancing Land Use;** Controlled burning is used to enhance land use by removing dead herbage, thus promoting the growth of new shoots and reduce the prevalence of cattle pests, especially ticks (Opige et al., 2023)
- **Enhancing Environment;** Controlled burning is used to reduce fire intensity and diversify fire regimes throughout the landscape to enhance habitat and biodiversity.

However uncontrolled fires have caused a lot of damage to people's property, life, livelihoods and environment throughout the world and should be managed. This perception has been the motivating force for conventional management approaches to wildfires all over the world.

1.2 Trends and current status of wildfires in Uganda

Conventionally, fire is used for cooking, lighting, clearing land for agriculture, replenishing pastures, controlling pests and invasives. Wildfires/burning is an old practice in Uganda that is not regulated. Burning is done in most parts of Uganda during the dry season; in the northern part of Uganda to clear land for cultivation, in the cattle corridor (Rakai) to clear grazing lands, control ticks, and allow new grass to sprout from the burnt scars during the rains (Kitutu Kimono, 2013; MWE, 2016). Fires are used as an important tool by Uganda Wildlife Authority (UWA) for management of conservation Areas. It removes dry biomass and maintains patchy vegetation offering a multitude of habitats for wildlife (Van Wilgen et al., 2004) .

However, the use of fire has sprout into wildfires that are causing a lot of damage to people's property, lives and environment. Anthropogenic activities emerge as one of the leading cause of wildfire incidences globally with an estimation of 4 out 5 fires caused by humans (Khakzad et al., 2018). Nearly all wildfires are human-caused, and some landscapes that once burned only at fairly long intervals are now burning multiple times within a 10-year period (Opige et al., 2023). In a recent fire outbreak that destroyed over 1000 hectares of land in Nakasongola District, arson and deliberate sabotage were zeroed down as the root cause of the fires while locals blamed the herdsmen in anticipation of the rains in March (Daily Monitor, 2025). Similarly fires that have caused huge losses in forest plantations are attributed to herders and hostile local communities on the periphery of forest plantations that set them in retaliation to the planters refusal to allow them grow crops in the licensed areas (MWE, 2016).

In Uganda, burning is done in the hottest season of the year and the peak fire seasons begins in Mid-November to March where debris will burn hottest and clear the desired area (Global Forest Watch, 2025; Nangendo, 2000). The impacts of fire on natural ecosystems and wildlife in Uganda began to be recognized in the 1960s, in response to the need for a comprehensive strategy for fire management (Opige et al., 2023). Uganda lost 70 ha of tree cover from fires with the highest loss recorded in 2013 of 96 ha (Global Forest Watch, 2025). A record of 7.3 million hectares of land were burnt in 2005 compared to 1.4 million hectares burnt in 2021 (Opige et al., 2023).

Frequent fires lead to spread of invasive fire climax species such as Imperata cylindrica which is not palatable to most wildlife e.g the Uganda Kob populations plummeted by at least 80% in one of the zones frequently burnt in Queen Elizabeth National Park (QUENP) (Jaksic-Born, n.d.)

The Government of Uganda through the third National Development Plan (NDPIII) acknowledges that wildfire is a threat to not only the environment but also infrastructure, cities and businesses. Similarly, the National REDD+ Strategy and Action Plan identifies wildfires as one the drivers of deforestation and forest degradation in Uganda. More so, the National Biodiversity Strategy and Action Plan II (2015-2025) recognized that wildfires are a threat to most biodiversity rich areas in Uganda thus calling for an integrated management. An example is the Wildfire Management Strategy for the Budongo – Bugoma landscape which was developed through a comprehensive stakeholder engagement to create fire free landscape. Budongo-Bugoma Landscape is an area covering the northern part of the Albertine Rift landscape and a well-known biodiversity hot spot (Plumptre et al., 2007) covering the districts of Kikuube, Hoima, Masindi and Buliisa. It hosts the largest forest reserves in Uganda i.e., Budongo and Bugoma and it is characterized by unique bird species, very rich plant diversity and incomparable endemic animal diversity. This area is dominated by vegetation types that are prone to wildfires especially grasslands, woodlands, coniferous plantations and bushlands,

A report by (Kitutu Kimono, 2013) revealed that twenty districts are at very high risk of wildfires, thirteen districts high risk and seventeen medium risk. The same report ranked Northern region as the most risky area to wildfires followed by the Teso region and then Rakai and West Nile. A study done by Ecological Trends Alliance (ETA, 2024) revealed that these areas are dominated by extremely flammable vegetation types such as; grasslands, woodlands, coniferous plantations and bushland thus increasing the incidences of wildfires. On the other hand, Kampala being a residential area with a number of commercial holdings has had the highest number of fire outbreaks reported since 2006 attributed to electrical short-circuits (Kitutu Kimono, 2013).
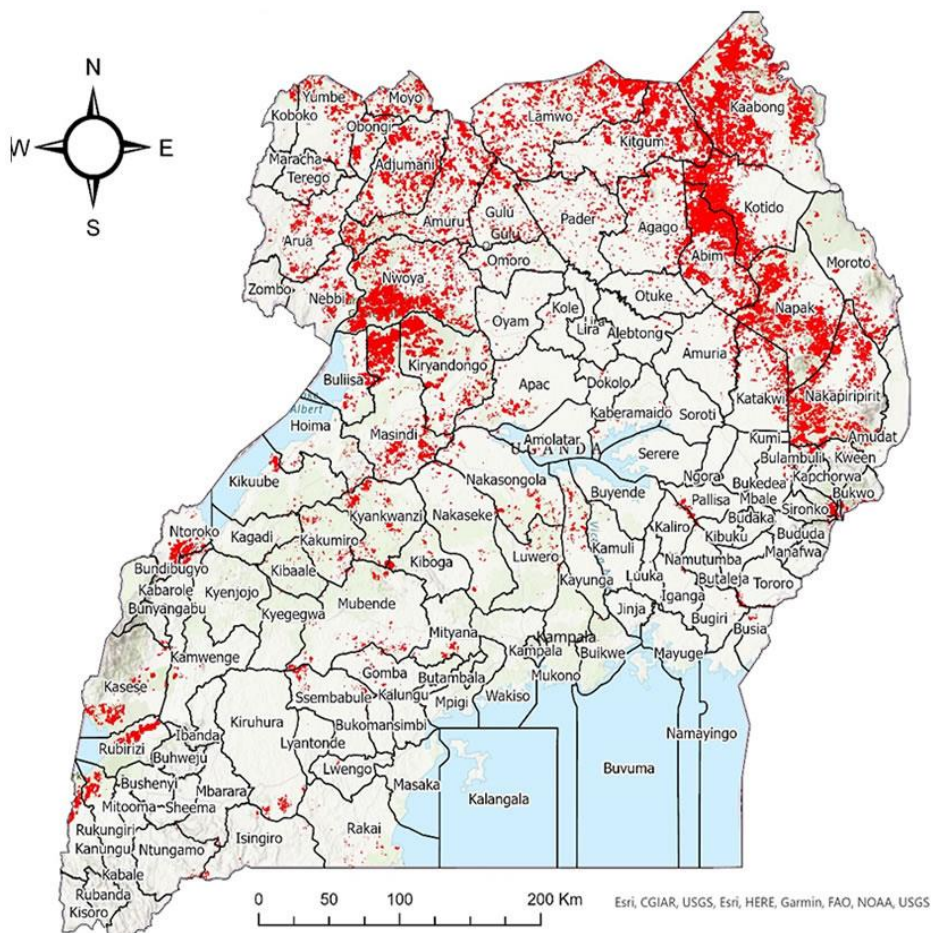
Figure 1 A map showing wildfire occurrences in Uganda

1.3 Causes of Wildfires in the Landscape
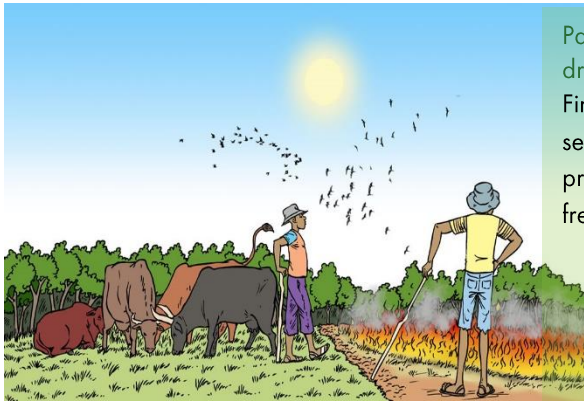
Pastoralist burning dry pasture;
Fires are normally set by pastoralist to prepare the land for fresh growth of grass

Accidental burning;
Poor methods of honey harvesting is one of the major causes of wildfires. This has the potential of destroying the flora and fauna of an area when burning is used for harvesting instead of appropriate methods of harvesting like using smokers.

1.3 Causes of Wildfires in the Landscape...

Intentional fire;

Arson: This is normally related with the relationship between the communities and the authority managing the protected area. Malicious or deliberate set of fire can be set by the community.

Slash and burn

This is done mostly in western and northern Uganda to prepare the land for the next planting season by farmers. Fires can likely go out of control if not closely supervised and this may lead to a great loss of life and property.

1.4 Effects of Wildfires

Wildfires lead to changes in the ecosystem, forest cover change, increase in greenhouse gasses, land degradation and land uses, affect ecosystem services consequently affecting biodiversity, livelihoods, public health and safety conditions thus threatening social-ecological sustainability.

At individual level, fires can lead to loss of live, property and business (livelihood) and thereby affecting the economic wellbeing of families and communities as a whole.

1.4 Effects of Wildfires

Wildfire management in Uganda has majorly been based on prevention and suppression techniques in the past years as the legislation is not strong on wildfires. The Wildfire Management Strategy for Budongo-Bugoma Landscape for 2025-2030 whose

vision is a wildfire free landscape stipulates some of the strategies and priority action towards managing wildfires in the landscape.

Lack of understanding and ownership of wildfire management by communities has led to a lack of concern to fire issues beyond the individual's immediate resources. The Strategy advocates for an integrated wildfire management so to address issues of wildfires across all stakeholders within the landscape (ETA, 2024).

Wildfire management is focused on managing the harmful effects of fire on lives, property, resources and environment. Approaches are based upon prevention and suppression strategies, such as discouraging the lighting of fires, making of firebreaks, establishment of early warning systems and focusing efforts to extinguishing fires whenever they occur and recovery measures after wildfire occurrence.

1.6 Why a landscape approach? (ETA, 2024)

1.6.1 Similarity in land use

Budongo-Bugoma Landscape is characterized by natural vegetation such as grasslands, bushlands and tropical natural forests. It is covered by protected areas such as Bugoma and Budongo forests, Murchison Falls Conservation Area and Kabwoya Wildlife Reserve whose boundaries are shared across the landscape. On the other hand, the landscape is covered by economic activities such as plantation farms; Sugarcane plantations, eucalyptus and pine and most importantly oil and gas.

1.6.2 Galvanize stakeholder efforts

The variety of stakeholders in the landscape ranging from small holder farmers to large scale owners of plantation farmers and to government institutions and agencies all bring a wealth of knowledge to efforts geared towards tackling wildfires as a common enemy.

1.6.3 Compounding effects

The world is grappling with the challenge of Climate change and the landscape is not an exception. Climate change has continuously been manifested through the continuous dry spells in the region. These combined with the anthropogenic activities such as slash and burn, hunting and others have led to the increase in the occurrence of wildfires in the region.

1.6.4 Nondiscriminatory nature of wildfire

Wildfires occur across the landscape at different land uses and or land cover and cause damage to people's property, livelihoods, lives and environment and therefore it was important to take a landscape approach as opposed to site specific actions.

1.7 National Legal Framework on Wildfires in Uganda

The only law that exists on wildfires in Uganda is the "Prohibition of Burning of Grass Act of 1974".

The act stipulates that under Section 2; Notwithstanding the Local Governments Act or any other written law to the contrary, the burning of grass by any person is prohibited in all areas of Uganda.

The Act grants permission to burn grass under the following conditions;

1) The sub-county chief may, in writing, after consultation with an officer of the veterinary or agricultural departments not below the rank of a veterinary or an agricultural assistant, authorize controlled burning of grass for a specific purpose; and that burning shall be under the supervision of a parish or sub parish chief.

(2) In the case of the burning of grass in a forest reserve declared as such under the Forests Act, the burning shall be carried out, or authorized in writing, by an officer of the forest department not below the rank of a forest ranger.

(3) In the case of burning grass in a national park, a wildlife reserve or a wildlife sanctuary, within the meaning of the Uganda Wildlife Act, the burning shall be carried out, or authorized in writing, by an officer duly authorized in writing, by the board of trustees.

However, exceptions are made, allowing the use of fire under strict care and supervision to prevent the spreading of fire, from burning grass for the purposes of clearing a compound, clearing land for farming, cleaning a town or city or making a fire break for protecting life or property.

1.8 Management Authority

At the time the Act was stipulated, the Ministry of Agriculture was the authority in charge however currently it is under the National Environment Management Authority (NEMA). The National Environment Management Act, No. 5 of 2019 stipulates the mandate of NEMA as the principal agency in Uganda responsible for the field of environment.

2.0 Elements of Fire Management

What is Fire?

Fire is a chemical reaction between Fuel, Air (Oxygen) and Heat. It occurs when all conditions necessary for it to occur are available and it is best represented by the "Fire Triangle"

2.1 Fire behavior

Fire can happen when each of the three elements is present in the rightful amount. To extinguish fire you need to break the Fire Triangle by removing one of the elements. If one element is not in the sequence, fire cannot occur.

The fire triangle
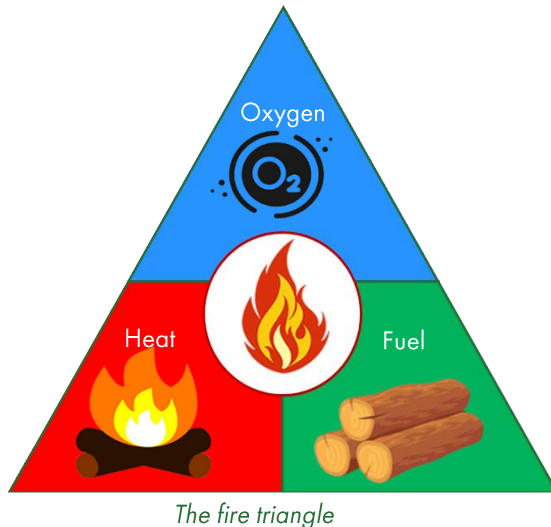
a.   Categories of Fires

There two categories of fire; forward fires and backward fires. Forward fire moves in the direction of the wind or uphill, and it's the most dangerous and difficult to control. On the other hand, backward fires spread slowly against wind or downslope, with shorter flames and lower intensity compared to the head fire.

a.   Types of Fires

Crown fires;
These burn through the canopy of trees or shrubs. They normally start as ground or surface fires and "ladder up" into the canopy through low branches or dense vegetation.
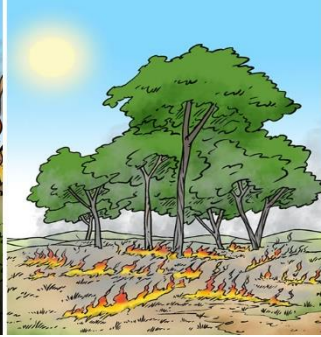
Surface fires;
Burn along the forest floor, consuming grass, leaves, fallen branches, and other low-lying vegetation. These can be beneficial in some ecosystems, clearing out underbrush, promoting new growth, and reducing the buildup of flammable material.
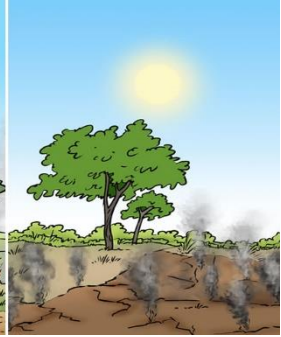
Ground fires;
Burn beneath the surface, consuming organic material like peat, roots, and decaying vegetation. They are harder to detect and extinguish because they produce less visible flames and more smoke. Often seen in areas with thick organic soil, like peatlands or forests with deep duff layers.

a. Crown fires   *b. Surface fires*   *c. Ground fires*

c. Factors influencing Fire

The factors that influence fire act upon the three elements of the Fire Triangle and can either increase or decrease the **Fuel**, **Heat** or **Air**. This will change the behavior of fire.

2.2 Wind

Wind influences; speed, direction and intensity of wildfires. It Provides oxygen to flames, helping the fire burn hotter and faster and carries embers ahead of the fire front, creating spot fires that make containment more difficult.

2.3 Time of Day

Wildfires behavior differently considering the temperatures or amount of heat at that particular time as seen through the heating of the sun during the day and the cooling of the night during the evenings and night times.

2.4 Time of the Year

The Time of the Year influences fire through the changing weather of the seasons.
Fire generally occurs in the Dry Season between June to August and late December to Early March. Based on Uganda's weather conditions, there are 4 seasons.

Table 1: Seasons and timing of the year

Timing	Season
November to Early March	Long dry
Late March to May	Long Rains
June to August	Short Dry
September - November	Short Rains

Fire Intensity and Rate of Spread change throughout the Fire Seasons being highest in the Long Dry Season (December-Early March).

2.5 Fuel Characteristics

The type and density of fuel (grass, sticks, leaves etc) influences the intensity and rate of spread of fire. Fuel is accumulated over the growing seasons (rainy season) and builds up over the years. Areas without fire for extended periods have high fuel loads while those that burn regularly have low fuel loads hence a fire in high fuel load will be intense and spread quickly compared to an area with less fuel load.

Topography can simply be seen as landforms and includes slope; percentage steepness and aspect or direction.

a. Slope

Fires up slope burn faster than those on flat ground due to heat rises and preheating vegetation above the flames, making it more flammable. The steeper the slope, the faster the fire spreads. Every 10-degree increase in slope can double the rate of spread.
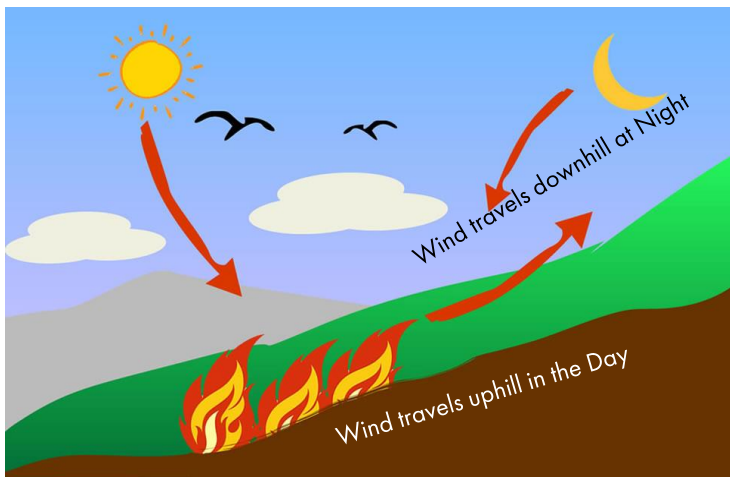

a. Wind and Slope

Slope and wind interact to create fire corridors accelerating wildfires. Wind blows upslope to push flames and embers ahead, accelerating fire spread

2.7 Wildfire Hazard Index

Is a score showing community's relative risk for wildfires at a given time resulting from a combined effect of surface temperature, wind speed and fuel characteristics. It's based on a score scale of 0 – 100.
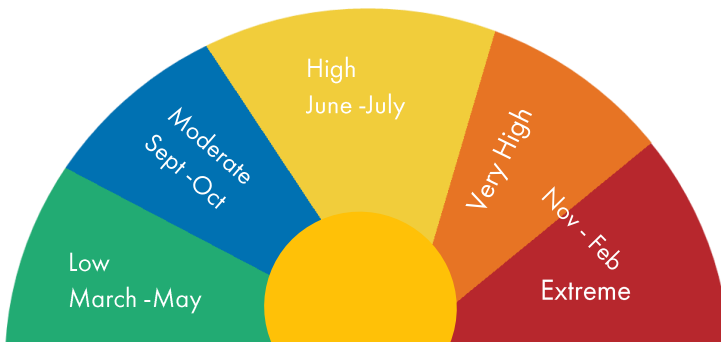
Wildfire hazard index for Uganda

How Fuel Load, Wind, **and** Temperature **work together to determine** Wildfire Risk:

Fuel Load. If an area has a high fuel load (lots of dry grass, bushes, dead trees), it's like stacking firewood: More material means a bigger, hotter fire;

Wind. Strong winds push the fire forward quickly and can carry burning embers to start new fires far away: Faster spread + unpredictable behavior.

Temperature. High temperatures dry out plants and soil, making them easy to ignite: Increases the chance of a fire starting and staying strong.

The combination of **high temperature, strong day in a forest full of dry, fallen branches** creates extreme wildfire risk because the dry material easily catches fire. The wind spreads the fire faster than firefighters can control. The heat helps the fire burn longer and stronger.

3.0 Fire Management Equipment & Safety

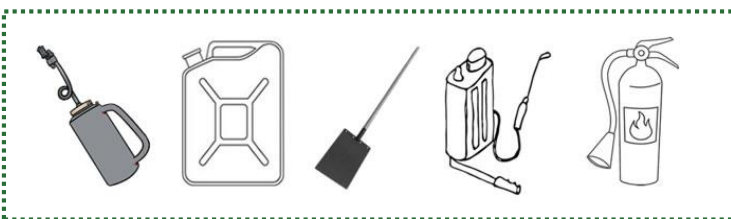## 3.1 Fire Management Equipment

The Team uses an assortment of equipment to implement different fire management activities.

3.1.1 Levels of Fire Management Equipment

1. Basic Equipment; drip torch, jerrycan, fire beater, knap sack spray unit, fire extinguisher.

2. Intermediary Equipment; Full PPE (fire suit, gloves, googles, gumboots, helmet), water bouser, fire hoses, tractors,
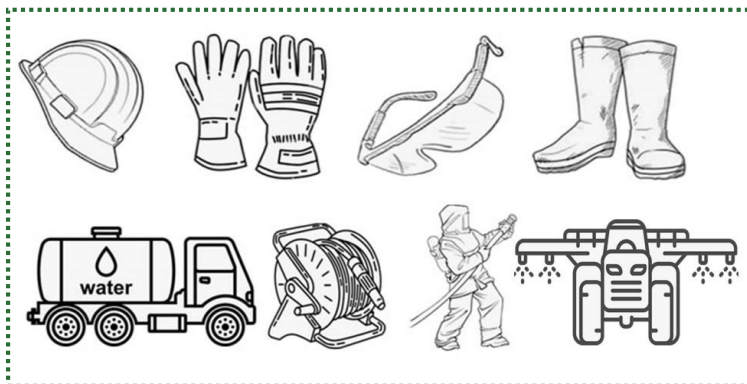
3. Advanced Equipment; Sprinkler drones, helicopters, aeroplanes

3.1.2 Equipment maintenance and servicing

Regular equipment maintenance and servicing is crucial for safety and efficiency and ensures equipment remains in optimal working condition. Please, ensure that servicing and maintenance of firefighting equipment is done regularly. This will guarantee its reliability, improve its lifespan, ultimately safeguarding lives and property in the event of a fire.

3.1 Fire safety

Safety is the most important aspect of fire management. Each Community Fire Team member and Fire Management Facilitator must have Personal Protective Equipment (PPE) such as work suit/coverall, gumboots, hat and goggles for eye protection.

4.0 Community Wildfire Management Planning

This section of the Training Manual is a guide to plan, develop and implement an Integrated Fire Management Program in communities.

This manual is developed to fulfill the following strategic objectives.

- To **Prevent and reduce** wildfires to foster biodiversity conservation and enhance sustainable livelihoods
- To improve on **wildfire preparedness**
- To develop **wildfire response** mechanisms
- To develop mechanisms for **post-fire restoration** and rehabilitation
- To **enhance awareness** and participation of stakeholders in wildfire management

 A community shall select a Community Fire Management Committee / Team as a functional group who manages fire and fire related issues within a given community. This Committee can be selected by traditional, local council or sub-county leaders and other relevant community members.

4.1 Steps towards Wildfire Management by the community

4.1.1 Form a wildfire Management Team

The team consists of Community Fire Controller and selected Community Fire team members.

The team should possess basic field based experience and training on management of wildfires thus able to spearhead and champion the implementation and coordinate fire management activities within a given location.

Roles of the Team

b. Mobilize for action planning
c. Training and skills' transfer
d. Coordinate stakeholders
e. Create awareness on wildfires
f. Facilitate community meetings
g. Manage fire and fire related issues.

Outputs

a. Draft community/location planning ideas
b. Propose community actions
c. Draft budget allocations
d. Prepare preliminary risks/ hazards
e. Draft preliminary timelines

4.1.2 Engage Stakeholders

For an integrated wildfire management; the selected fire team should list all the stakeholders (roles and responsibilities) including the neighboring communities and landlords, identify their interests, educate the stakeholders about risks and hazard and include their ideas in subsequent planning activities as suggested by the stakeholders.

Community engagement on wildfires

4.1.3 Conduct Field Surveys

Conduct a walk within the community or fire management area and take notes on; fire history, land use types/land cover, risks and hazards, existing roads (fire breaks, routes or pathways), community resources, infrastructure and a map of the area should be drawn and this information shared with all the stakeholders.

Community setup

4.1.4 Design a wildfire management plan

A plan with well-defined objectives/goals, tasks, resources (people, budget, and materials), responsibilities, timeline and monitoring and evaluation should be designed.

The designed plan should be able to achieve the following outputs; record of any activities done towards fire management, Fire management protocols (do's and don'ts) for different fire management zones e.g. the different land uses, environment and a Permit to burn application.

4.1.5 Implement the community wildfire management plan

The fire management team is tasked with continuous stakeholder engagement, following up on agreed roles and responsibilities and creation of awareness on management of wildfires.
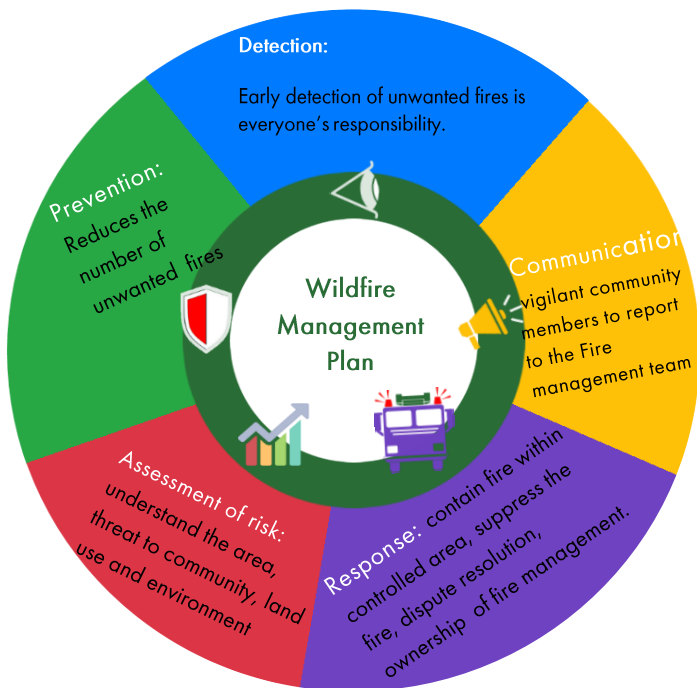

Figure 2: Series in Wildfire management

4.1.6 Wildfire Management Plan Monitoring

A post fire community evaluation workshop should be held to access community attitudes and the effect of the wildfire management plan towards the management of wildfires and review the fire management objectives. Where necessary, the Fire Management Plan will be reviewed and a Fire Management Report produced.

4.1.7 Wildfire reporting

Emergency contact lines for Uganda Police Force should be used in case of any serious fire outbreak and if possible coordinates shared with the fire brigade where the fires have occurred.

4.2 Factors to consider during implementation of Wildfire management protocol

Fire management activities within each Fire Management Area are implemented in accordance with the Fire Management Plan. The Community Fire Controller leads and coordinates firebreak maintenance, controlled burning operations and wildfire management. It is important to continue Coordination, Liaison and Awareness throughout Fire Management Implementation
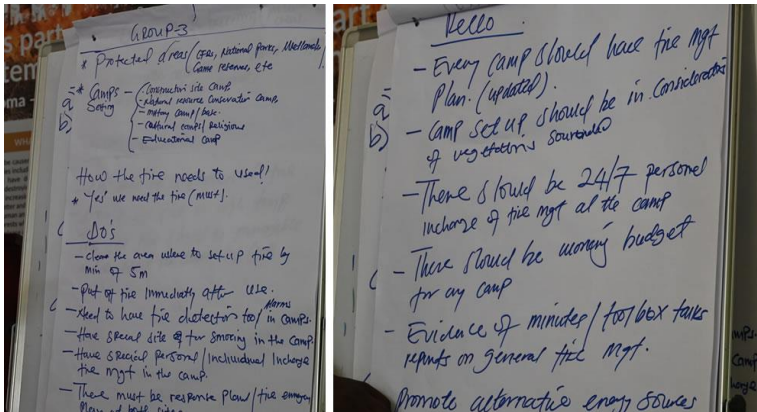
Management of wildfires in PAs raised during wildfires ToTs workshop

4.2.1 Firebreak Establishment and Maintenance

Firebreaks are designed to provide access and a safe environment for Teams to implement controlled burning and manage wildfires. Firebreaks alone are not designed to stop uncontrolled fires.

Existing roads and tracks are the foundation of any firebreak network. They provide considerable access to implement controlled burning and other fire management activities. Firebreak establishment and maintenance is a very intensive activity and requires substantial resources and time.

It may be necessary to maintain firebreaks along some boundaries. Where firebreaks are required around infrastructure or resources (ie fields with fences) the Team can provide technical and resource (equipment) assistance to owners. Generally, firebreaks are established where fire intensity will be the lowest (i.e. low fuel load).

4.2.2 Controlled Burning

Many factors influence controlled burning and it is not possible to cover all eventualities in a step-by-step guide. Timing of the year and timing in the day are the most important aspects to consider. Flexibility is required to adapt to conditions at the time to ensure controlled burning meets the objective. The most important guide is to **start early in the season** or **start late in the day**. One should assess the elements that influence fire e.g. time of day, wind direction and speed, time of the year, fuel load and type, location of firebreaks etc.

4.2.3 Protecting infrastructure and resources from fire.

Resource and infrastructure protection bans should be instituted for villages, Cattle Posts, Crop Fields and Fences etc. where necessary.

a.   Removing Fire Fuel Load

Resource and infrastructure is secured by removing fuel loads through controlled burning to establish buffer zones. It will not be possible for fires later in the year to reach resources or infrastructure with no fuel to burn around it.

b.   Burn Against the Wind

When implementing protection burns, start burning against the wind on the downwind side of the resource or infrastructure. Burning against the wind creates a fire of low intensity and low rate of spread = Easy to Control.

a. Controlled Mosaic and Land Use Burning

Land use objectives determine fire management requirements. Controlled burning is implemented in specific areas to enhance land use and establish a mosaic of burnt and unburnt patches throughout the Fire Management Area. Additional mosaic burning is implemented in the Early Dry Season and in the early afternoon to create a cool fire regime and increase the mosaic burn pattern as required.

4.2.4 Wildfire Management Season

The Wildfire Management Season commences on December to early March. Long Dry Season weather conditions and fuel characteristics cause intense fires that spread quickly. Fires at this time of year will not stop until they reach an area with no fuel (i.e. road, river etc.) or are manually extinguished.

5.0 Guidelines for Wildfire Management for Some Land uses

Wildfires can be managed using the phenomenon of a "Fire Triangle". The sides of the triangle represent factors necessary for combustion and flame production and these are; oxygen, heat and fuel. When one of these is removed, the fire ceases. This principle can be used in management of wildfires within the different activities as shown below.

Use of Wildfire	Purpose of Burning	Time of the year when it Occurs	Recommendations to manage wildfires
Small Scale Agriculture	• Control pests and diseases. • Clear land for agriculture (slash and burn)	• January to March. • July to August	• Create a fire break • Burning should be done after 6pm • Burning prohibited during the day • Burning should be done with authorization • A fire management team should be present on site
Sugarcane Plantations	• Fireline management • Pest control	• November to December • After the harvest	• Create a fuel free fireline • Fires should be lit in the late evening after i.e. 6pm • All stakeholders e.g. neighbors should be informed • There should be a firefighting team present on standby. • No fire in the day • No fire without authorization • No setting fire without an onsite management team

Use of Wildfire	Purpose of Burning	Time of the year when it Occurs	Recommendations to manage wildfires
Tree Plantation	• Fireline Management	• November to December • June to July	• Create a fuel free fireline • Fires should be lit in the late evening after i.e. 6pm • All stakeholders e.g. neighbors should be informed • There should be a firefighting team present on standby. • No fire in the day • No fire without authorization • No setting fire without an onsite management team
Pastoralism	• Pest Control. • Replenishment of pasture	• December to January	• Establish fire breaks. • Burning should be done after 6PM. • Burning ought to be done with authorization. • No setting fire without an onsite management team. • Monitoring done before & after firing. • Penalties put for unauthorized fires. • Support local governments to institute ordinances and implementations

Use of Wildfire	Purpose of Burning	Time of the year when it Occurs	Recommendations to manage wildfires.
Apiary	• Harvesting honey	• Anytime time of the year	• Fire must be in smokers during honey harvesting. • Harvesting done late in the evening (Night) or very early in the morning before 10am. • No Harvesting during the day
Built-up areas	• Cooking • Ironing • Burning waste • Factories • Steam & Sauna • Warming • Back-firing • Cultural practices	• Anytime of the year	• No fire out of a kitchen • Control fires at all times • Fire monitoring at all times • Have firefighting equipment/materials. • Limit Fire setting from awkward times • Avoid flammable liquids. • Do not ignore fire safety alerts. • Set up a firefighting team • Reporting mechanisms should be put in place and emergency response call lines shared with communities in such areas. • Establish early warning or predictive systems for fire outbreaks • Establish an area of fire defensive (10 meters from the property).

Use of Wildfire	Purpose of Burning	Time of the year when it Occurs	Recommendations to manage wildfires.
Protected Areas (PAs)	• Replenishing pasture • Controlling invasive species	• Anytime of the year	• Put off fire immediately after use. • Need to have fire detection tool/ Alarms in within PAs. • Designate sites for smoking in PAs with stringent regulations. • There must be response plan/ fire emergence plan for the respective PAs. • Controlled burning (protected areas) • Don't set fire in high temps. • Carryout regular toolbox talks on fire management. • Fire lines should always be established and maintained frequently, at least 5 to 6 meters fire lines should be made. • Regular patrols to discover any illegal activities like charcoal burning in these areas that may culminate into wildfires. • Back firing can be done incase of a fire outbreak and should also be done by a professional. • A fulltime wildfire response unit and trained personnel should be instituted near protected areas. • Fire towers should be established in PAs especially in forested areas.

Use of Wildfire	Purpose of Burning	Time of the year when it Occurs	Recommendations to manage wildfires.
Camps (cultural, recreational, vigils).	• Setting up camp. • Keeping warm. • Scaring away wild animals	• Anytime time of the year.	• Clean the area where to setup fire minimum of 5 meters. • Fire lines should be established • Put off fire immediately after use. • Extinguish the ambers of the fire when leaving the camp with water or sand or ash. • Need to have fire detection tool/ Alarms in camps. • Have special site for smoking at the camp. • Have special personal / Individual in charge fire management in the camp. • There must be response plan/ fire emergence plan at both sites. • Promote alternatives (solar, biomass).
Charcoal Production	• Combustion to convert wood into charcoal.	• Anytime time of the year.	• Site inspection where the kiln will be established and seek permission. • Charcoal kiln should be located away from neighboring farmland/ homesteads etc. • Suppress the remaining ambers during the unearthing of the charcoal. • Frequent monitoring of the kiln during burning and harvesting of hot charcoal. • arvest charcoal very early in the morning (not beyond 10am). • Inform surrounding neighbors.

			• Advisable to burn during the rainy season an avoid the dry season.
			• Involve a technical person before burning.
			• Create fire lines around the kiln.
			• Avoid open flames from the burning kiln.
			• Use appropriate technology like casmance kiln to reduce the risk of open fires.
			• Develop bylaws/ordinances on charcoal production.
Burning Waste.	• Reduce accumula tion of waste	• Anytime of the year	• Collect wastes in one place. • Sort wastes, 4Rs (Reduce, Reuse, recycle, re-purpose) • Burn away from built-up areas like residentials, farmlands etc. • Burn waste during late evening and early mornings. • Avoid burning during hot and windy hours. • Always extinguish the remaining ambers • Use of waste handlers • Have fire extinguishers in place Promote incinerators for wastes like medical and plastics.

Technical Terms

Controlled Fires: Also known as Prescribed Burning Involves setting planned fire for ecological restoration, forest management, land clearing or wildfire fuel management.

Fire detection: Alertness of any fire in an area

Fire Intensity: Amount of energy or heat given out by a fire or behavior of fire measured by the length of the flame or rate of

Fire prevention: Steps taken to fight fire

Fire regime: It is the pattern, frequency and intensity of fires in an area recorded over an extended period of time.

Fire risk: The likelihood of occurrence of fire.

Fire triangle: A model that explains the three essential elements required for fire to occur.

Fire: A chemical combustion between oxygen, heat and fuel.

Fire team: A group of people collaborating to fight fire.

Fuel load: Amount of biomass present in a given area.

Wildfire hazard index: Shows the intensity of fire for a given period **on:**   Steps taken to fight fire.

Wildfire hazard: Potential occurrence of wildfires due to environmental factors or Human causes.

Wildfire preparedness: Approach to minimize the risk and occurrence of wildfires.

Wildfire response: Process of managing wildfires.

Wildfire: A fire that goes beyond human control.

Uncontrolled Fires: Fire that has gone out of control and threatens to destroy property, lives, and natural resources.

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Ecological Trends Alliance is a registered nongovernmental organization in Uganda, starting operation in 2011 as a limited guarantee company, and registered with the National bureau for Non-Governmental Organizations in 2016. Our mission is to secure global solutions to biodiversity, development and tourism challenges through providing biologically diverse and proven alternatives Ecological Trends Alliance implements programmes, projects and studies in biodiversity conservation and sustainable development, in partnership with national, multinational and international companies and organizations. This has included environmental, social and economic research, impact assessments, inclusivity studies, forest governance and community engagement, conservation (camera trapping, wildlife telemetry, etc.), human-wildlife conflict management, tourism potential site assessments, restoration of degraded landscapes, enrichment planting and agroforestry, landuse planning, offset valuation and impacts of agrocommodity production.

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