

# Wildfire management training at Rugezi Swamps, Rwanda

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Human Activity bordering Rugezi Swamps July 2024

The Rugezi Swamps in Rwanda, a Ramsar-designated wetland of international importance, are critical to the region's ecological and socio-economic stability. Spanning approximately 6 735 hectares in a high-altitude valley, the wetland supports diverse wildlife, including endangered species like the Grauer's swamp warbler and Grey Crowned Crane. It also plays a pivotal role in water regulation, carbon sequestration and driving hydroelectric power plants that supply electricity to Rwanda.

Despite its significance, Rugezi Swamps have become

increasingly susceptible to wildfires, worsened by climate change, human encroachment and overexploitation through agricultural and resource-based activities. Recognising the need for a coordinated response, the Wildfire Training Programme was launched from 20 to 25 July 2024, designed to equip community rangers and stakeholders with practical skills and strategies to manage and mitigate fire incidents effectively.

## The need for wildfire training

Over the years, wildfire incidents in the Rugezi Swamps have resulted in devastating losses.

Earlier fire events in 2021 and 2023 destroyed large portions of the swamp, displacing wildlife and causing long term ecological damage. Human-related activities, such as charcoal production and unregulated cooking near the marsh, have been major contributors to these incidents while lightning is the confirmed ignition source for a fire that occurred in October this year.

Moreover, the lack of formal training and equipment for local firefighting teams meant that fire response efforts often relied on rudimentary tools and techniques, such as using

sticks to beat out flames. This approach was not only inefficient but also dangerous, as fires in peatland ecosystems often smoulder underground for days, making suppression challenging.

A major concern lies in the nature of the swamp itself. Rugezi's peat-rich soils and dense vegetation, particularly *Miscanthidium violaceum*, make it highly flammable during dry seasons. The fire can spread quickly across dry vegetation while smouldering beneath the surface for prolonged periods. This combination of ecological vulnerability and human activity created an urgent need for professional training to protect the wetland and the surrounding communities.

## Challenges of fire management in the Rugezi Swamps

The unique environment of the Rugezi Swamps poses significant fire management challenges. These include:

- Peatland fires: The swamp's peat-rich soil allows fires to spread underground, appearing later as spot fires, even after surface flames appear extinguished. Such fires are notoriously difficult to control.



Fighting fire with sticks 2023

- Terrain accessibility: Rugezi Swamps are surrounded by steep hills with dense vegetation, complicating access for firefighting teams and equipment. Additionally firefighting operations often take place on floating vegetation islands of irregular density floating on the surface of the water. This creates the very real threat of drowning should one fall through a less dense parts of the 'vegetation mats' while fighting fire.
- Human pressures: Communities rely heavily on the swamp for grazing, papyrus harvesting and

- agriculture. These activities often increase fire risk during dry seasons.
- Resource limitations: Prior to the training, firefighting equipment was inadequate and the lack of coordinated response teams further hindered fire suppression efforts.

The need for a specialised, community-based response to wildfire management became clear after multiple fire incidents underscored these challenges. This led to the design and implementation of a training programme specifically tailored for the Rugezi environment.



Initial site assessment by instructors Rugezi Marsh 19 July 2024

## Overview of the Wildfire Training Programme

The Wildfire Training Programme was organised by the Rwanda Wildlife Conservation Association (RWCA) in collaboration with the Rwanda Environment Management Authority (REMA) and the US Forest Service. It aimed to address key gaps in fire management through a combination of theory, practical exercises and community engagement.





Fire Management Theory Training Rugezi 21 July 2024

- The programme had the following primary objectives:
  - Equip rangers, community members and stakeholders with essential firefighting skills
  - Develop fire management protocols specifically suited for the Rugezi Swamps
  - Strengthen collaboration between local communities, authorities and environmental agencies
  - Introduce sustainable practices to mitigate human-induced fire risks.

Training activities and structure

- Understanding fire behaviour
- Participants were introduced to fire chemistry and the ‘fire triangle’ ie fuels, topography and weather, which influence fire behaviour. Trainers emphasised the unique challenges posed by peatland fires and Miscanthidium vegetation in the Rugezi Swamps.
- Fire suppression techniques
- Practical demonstrations included the proper use of firebreaks, knapsack pumps and beaters to extinguish surface and underground fires. Participants practiced locating smouldering fires in peat by looking for hotspots and smoke.



Rugezi Swamps July 2024

- Miscanthidium vegetation for water application to stop fires from reigniting.
- Establishment of Wildfire Fighter Teams
- On 31 July 2024, following the training, eight wildfire fighter teams were officially established. These teams, composed of trained rangers and local representatives, were strategically assigned to sectors around Rugezi Marsh to ensure rapid fire response.

Integration of community-based fire management

The training prioritised a community-centric approach, recognising that local residents are both stakeholders and first responders during fire incidents. Key strategies included:

- Community involvement
- Local leaders, community members and rangers actively participated, ensuring knowledge transfer and ownership of fire management plans. Plans were made to expand the teams by incorporating more community volunteers.
- Strategic placement of firefighting equipment
- Following the training,

- firefighting equipment, such as fire beaters, hoes and knapsack water pumps, was distributed to three key stations: Butaro Ranger Post, Miyove Ranger Post and the Rwerere Community House. This arrangement ensures rapid access to resources in fire-prone areas.
- Sustainable alternatives and awareness
- To address human-induced fire risks, the training introduced sustainable practices, such as promoting wetland-friendly farming methods and public awareness campaigns on fire prevention. Educational materials were also recommended for schools and local meetings.

Outcomes and impact

The Wildfire Training Programme was widely regarded as a success, achieving its objectives and laying the foundation for integrated fire management at Rugezi Swamps. Key outcomes include:

- Improved capacity: Trained rangers and community members are now better equipped to respond to wildfires using professional techniques and tools.
- Organised firefighter teams: The establishment of wildfire fighter teams ensures a coordinated response, with trained leaders assigned to key sectors around the swamp.
- Enhanced awareness: The programme fostered a deeper understanding of fire risks, prevention methods and the ecological importance of the Rugezi Swamps.
- Resource distribution: Strategic placement of equipment ensures quick response times, addressing



RWCA staff and rangers assess the damage and ensure it has been fully extinguished 2023



Trainers and participants celebrate at the conclusion of the training, Rugezi 25 July 2024

earlier challenges related to terrain accessibility and equipment availability.

Way forward

- The success of the July 2024 wildfire training highlights the need for ongoing investment in fire management at Rugezi Swamps. Recommendations for future action include:
- Expanding training to more community members and stakeholders
  - Developing a formal Fire Management Plan as part of the overall Rugezi Marsh conservation strategy
  - Strengthening fire prevention campaigns and integrating fire safety education into schools
  - Enhancing community

engagement to ensure sustained cooperation in fire management.

Conclusion

The Wildfire Training Programme at Rugezi Swamps is a significant milestone in the conservation of this critical wetland. By equipping local communities and rangers with the skills, tools and strategies to manage wildfires effectively, the programme not only enhances ecological resilience but also protects the livelihoods of those who depend on the swamp. This integrated, community-based approach sets a strong precedent for sustainable fire management and environmental stewardship in Rwanda. ▲