



DSL-IP LEARNING EVENT

GOOD PRACTICES IN FIRE MANAGEMENT – 25TH APRIL 2024

**Use of Sediment Retention Fibre Rolls (SRFR) and Erosion Blankets
to stabilise slopes after fire – Example from South Africa**

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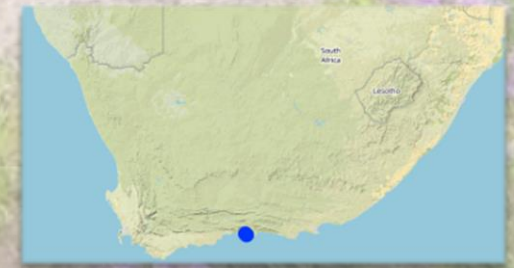
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Background



- ❑ The area receives summer and winter rainfall with an annual average of around 650 to 700 mm.
- ❑ The Knysna fires were the worst wildfire disaster in South African history (more than 21 000 ha were affected – destroying more than 800 buildings, 5000 ha of forest plantations and claiming the lives of seven people).
- ❑ Investigations reported that its severity was caused by a cocktail of factors, including drought, low atmospheric humidity, strong warm Bergwind conditions and abundant biomass.
- ❑ After the fires, the lack of vegetation cover on steep sandy slopes in the affected areas posed an immediate danger of erosion and landslides to downstream catchments, ravines and man-made infrastructure.



Background (damage caused by the wild fires)



Main purpose of the restoration technology

- ▣ Reduce, prevent, restore land degradation
- ▣ Conserve ecosystems
- ▣ Protect a watershed/ downstream areas – in combination with other Technologies
- ▣ Preserve/ improve biodiversity
- ▣ Reduce risk of disasters



Implementation stages

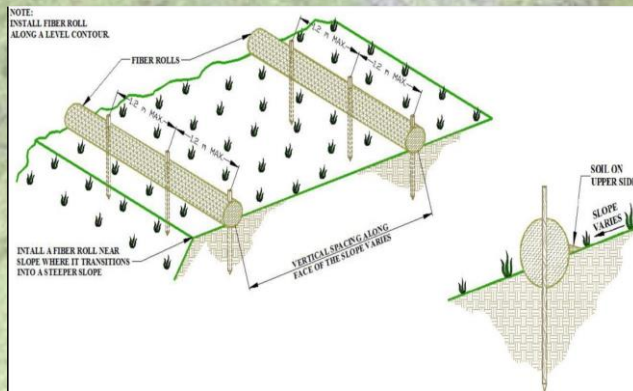
- ▣ Identification of priority areas where infrastructure was threatened (using GIS modelling and remote sensing).
- ▣ Acquisition of restoration materials – SRFR and erosion blankets produced through secondary industries (Department of Forestry, Fisheries and the Environment – DFFE) created through the removal of invasive alien plants (poplar and aspen).
- ▣ Training of local community members on implementation of restoration measures.
- ▣ Removal of all burnt woody material.
- ▣ Installation of erosion control blankets or hydroseeding (seeding using a slurry of seed and mulch).
- ▣ Installation of SRFR.
- ▣ Introduction of indigenous seed.
- ▣ As part of maintenance, removal of invasive alien vegetation seedlings.



Methodology

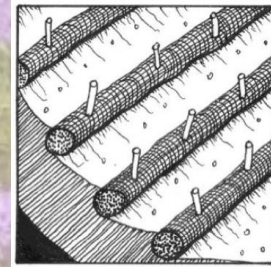
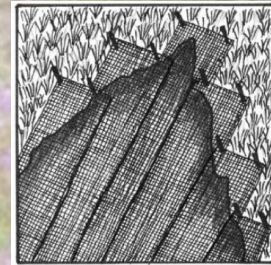
▣ Installation of the SRFR

- Prepare the area to be restored.
- Determine the spacing of the rolls as a function of soil type and slope.
- Installation of erosion rolls (6 m long) and blankets (2.5m x 50 m) – blankets must overlap.
- Use wooden stakes to secure the rolls and blankets – rolls (50cm) – 1.2 meter apart, blankets (30cm) – 1meter apart.



Methodology

- ▣ **Installation of the erosion blankets**
 - Ensure the site is properly prepared before installing any blankets. The site should be fine graded to a smooth profile and relatively free from all weeds, clods, stones, roots, sticks, rivulets, gullies, crusting and caking. Voids are filled and the slope should be compacted properly.
 - An anchor trench 20 cm deep by 20 cm wide is dug at the top of the slope. The blankets will be anchored in this trench with stakes.
 - Starting at the crest of the slope, the blankets are rolled down the slope in a controlled manner.
 - Proceed with seeding (hydroseeding) of the area to be restored.

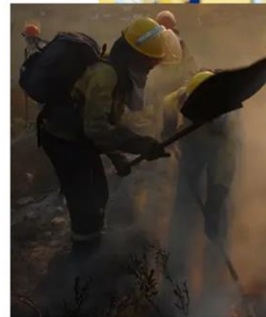


Funding

- ▣ The restoration was funded mainly by the Department of Forestry, Fisheries and the Environment (DFFE) as part of the Working on Fire Programme

WORK OPPORTUNITIES TO YOUNG MEN AND WOMEN


Working on fire is an Expanded Public Works Programme (EPWP) aimed at providing work opportunities to young men and women. The Programme resides under, and is funded by, the Department of Environmental Affairs. Participants are recruited from marginalised communities and trained in fire awareness and education, fire prevention and fire suppression skills. In addition, they are also trained in skills such as first aid, carpentry, cooking, health and safety and communications.



Funding

Restoration material

- Biomass from the invasive grey poplar tree is being used to create wood-wool, soil blankets, and erosion control 'sausages'. Aspen Wood fibre, funded by the DEFF and in association with LEAD Associates, produces the only restoration materials made exclusively from invasive alien biomass in South Africa.





IMVELISI
Developing African Enviropreneurs

Become an enviropreneur in the invasive plant biomass economy

Clearing invasive aliens strengthens South Africa's water security ...

... but there's also huge benefit for the economy, and the wealth of communities, thanks to the businesses it stimulates.



Erosion control sausages made from shredded invasive grey poplar are used to stabilise erosion on slopes after fires.

Restoration products: blankets and sausages

Biomass from the invasive grey poplar tree is being used to create wood-wool, soil blankets, and erosion control 'sausages'. Aspen Wood Fiber, funded by the DEFF and in association with LEAD Associates, produces the only restoration materials made exclusively from invasive alien biomass in South Africa.

The company uses primarily invasive poplar from riparian zones and on river banks where it consumes vast amounts of water. Over 170 000 hectares of

riparian zones in the most arid parts of South Africa are invaded by poplar which needs to be removed by law.

Sausages and blankets are used by disaster management after fires and floods to stabilise slopes and prevent mud slides.

They are also used by environmental agencies and mines to combat significant land degradation through landscape and resource exploitation. Mines or quarries that close have to rehabilitate the land by law.

Erosion control sausages proved to be vital in stabilising steep slopes around Knysna after devastating fires burnt away thousands of hectares of forest in the southern Cape in June 2017.



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Impacts

- ▣ It is estimated that 53 km of wood fibre rolls (or "sausages") and 54 000 m² of erosion blankets have been installed in the post-fire erosion mitigation projects - reducing the risk of land slides and flooding.
- ▣ Vegetation cover improved with the introduction of hydroseeding and retention of topsoil containing indigenous seeds.
- ▣ The introduction of sediment trapping structures as well as improved vegetation cover resulted in less downstream siltation.
- ▣ Restoration resulted in job creation for local communities.
- ▣ Improved ecotourism - land restored to natural state - hiking and cycling.
- ▣ Maintenance of the applied technology included the removal of alien species.



Conclusion and links

The disaster has taught us important lessons, particularly around the importance of project management support in emergencies like these, and the value of partnerships to ensure a full and co-ordinated response.

Links

KNYSNA FIRES 2017

<https://www.knysnamuseums.co.za/pages/knysna-fires-2017/>

Sediment retention fibre rolls

<https://www.ectc.org/sediment-retention-fibre-rolls-srfrs->



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