Pampas grass

(Cortaderia selloana)

Managing pampa grass in the Salazie and Mafate cirques (Réunion Island)

French National Forestry Agency (ONF)

■ ONF is a public agency that manages over 100 000 hectares of public forest on Réunion Island, representing 40% of the total island surface area. The managed forests cover 85% of the central zone of the Réunion national park.

■ ONF is in charge of implementing forestry policy (monitoring, execution of development plans, work planning) and of running studies and projects dealing with ecosystem conservation, wood production and installations to welcome the public.

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Intervention site

■ In the natural environment, pampa grass has been observed since 2001 in the Salazie and Mafate cirques. Elsewhere on the island, the grass is generally limited to gardens where it is used as an ornamental plant.

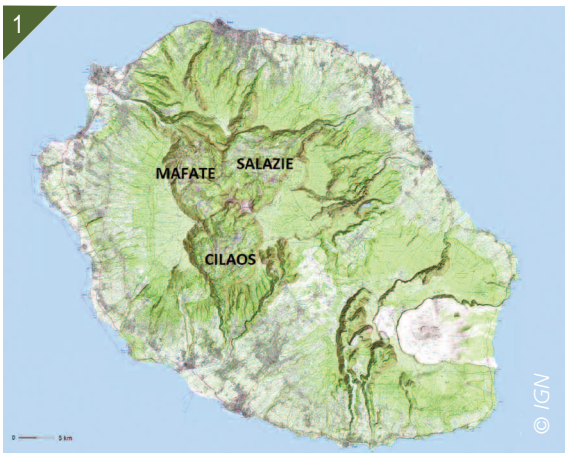
■ The two cirques, formed by the collapse of the *Piton des neiges* mountain, include numerous areas with ramparts that are very difficult to access. The cirques and ramparts on Réunion Island have been listed as part of the world cultural and natural heritage since 2010 and the invasive alien species (IAS) are considered the main threat to the ecological integrity of the sites.

■ The species had developed a sizeable colony in the Salazie cirque with numerous, dispersed groups, in particular along the Mât River. Several thousand individual plants were identified, ranging from large clumps occupying several square metres to individual juveniles only 10 cm tall. In the Mafate cirque, small populations were observed along the Galets River, the Col des Boeufs pass, the Merles plain and the Scout path.

Disturbances and issues involved

■ Pampa grass is a highly competitive species that consumes considerable quantities of resources to the detriment of the native flora. The proliferation of the species provokes profound changes in the structure and composition of vegetation.

■ The grass is highly inflammable and can increase the risk of fires.



1. Position of the cirques on Réunion Island.
2. First stands of pampa grass found in the Merles plain in 2001.

■ It also constitutes a favourable habitat for brown rats (*Rattus norvegicus*), an invasive alien species that destroys native bird populations and is a potential carrier of leptospirosis.

Interventions

■ Past interventions

■ Since 2012 in the framework of the operational plan against invasive species on Réunion, the species has been the target of a regional plan, where the local Environmental Directorate (DEAL) funded the work done by the National Forestry Agency (ONF). Since the initial inventory phase, the purpose of the work has been to eliminate stands of grass early in the invasion process in order to avoid massive colonisation of the natural environment.

■ For the status report in 2012, surveys were carried out on foot along forest paths and trails, in dark-wood forests (typical of the highlands on Réunion), along ravines, rivers and ponds, and around inhabited areas and camp grounds. Searches were also run using helicopters to detect sites located in areas difficult to access.

■ Since 2013, manual uprooting campaigns have been carried out annually and further surveys have been run to monitor changes in the grass populations and to detect any new populations.

■ The uprooting method and the final destination of the green waste depended on the growth stage of the plants, the substrate and the accessibility of the given area. In areas that could not be accessed on foot (Mât River and Haut de Grand Sable), the teams were transported by helicopter.

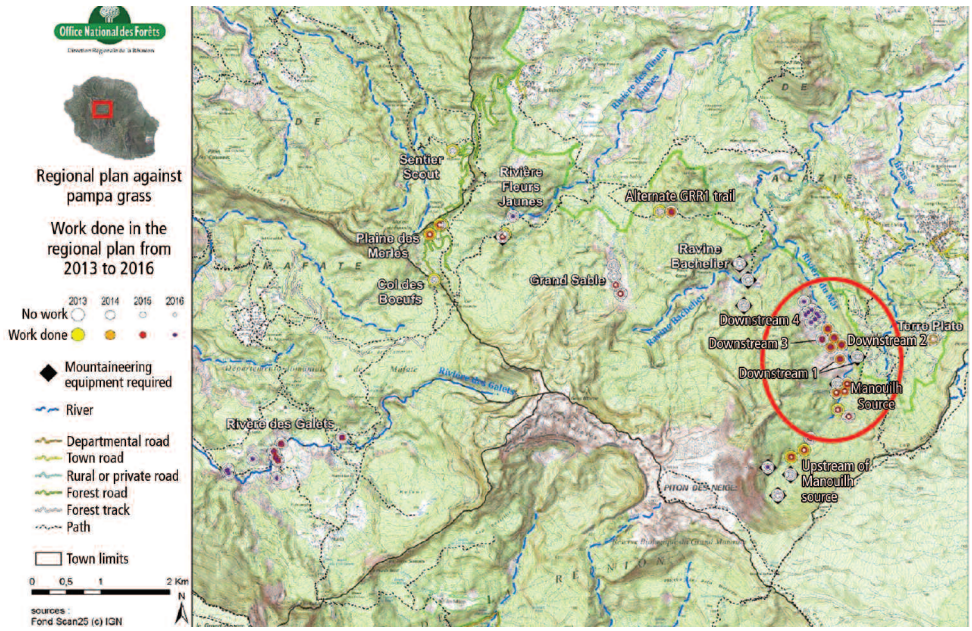
■ During surveys on foot, small plants were uprooted by hand and buried on site. Larger plants were first cut down, the stump was uprooted and broken up, then the entire remains of the plants were buried on site. If the type of soil made burial impractical, the waste was bagged (big bags or garbage bags) and temporarily stored in a cleared area in the Merles plain, then buried using a backhoe loader.

■ In areas that were difficult to access, the workers were transported by helicopter and used mountaineering equipment. Small plants were uprooted and larger plants were cut down. Depending on the local conditions, the waste was either strewn over large rocks, burnt if rats were present in the area (to avoid dispersal of the plants) or bagged and transported by helicopter to the cleared area for burial.

■ Plants were cut down using a cane machete and then uprooted using spikes, metal rods with a triangle welded to the point, pick-axes and ice-axes.

■ Uprooted sites were then monitored annually to eliminate any sprouts and new plants.

3, 4. Removing pampas grass.
5. A pick-axe used to remove stumps.



Map showing the uprooting sites.
The area circled in red is the area downstream of the Manouilh source where particular efforts were made in 2016 and 2017.

Results and costs

Results

Surveys run after the work done requiring helicopters indicated that the pampa grass had disappeared from certain work areas, which was an encouraging sign.

On the other work sites, a reduction in pampa grass and a slight amount of new growth were observed, except in the areas downstream of the Manouilh source where numerous sprouts and new seedlings were noted. These areas were subjected to a particular effort in 2016 and in 2017 with 372 plants uprooted and buried, plus over 1 200 seedlings destroyed during a total of 24 work days.

Most of the new sprouts did not have enough time to flower between two uprooting operations.

The introduction and/or return of the species would appear to be slowed by the presence of a dense, herbaceous cover or by forest given that the most heavily invaded and recolonised areas are those exposed to the sun and with no plant cover.

Costs

Human resources invested in the uprooting work.

Year	2013	2014	2015	2016	2017	2018
Forest workers (man-days)	24	27	40	22	24	40
ONF agents (man-days)	4	5	7	6	NA	
Helicopter (flight hours)	2	3	4.5	5	3	5

NA: Not available.

Teams doing surveys and removing plants on foot consisted of at least five people, teams transported by helicopter consisted of four (the number of passengers per trip).

Contrary to the other years, the work requiring mountaineering equipment was not carried out by ONF forest workers in 2017 and 2018 because it took place on one of the most difficult sites, namely a rampart 600 metres high in the area downstream of the Manouilh source, in the Salazie cirque. This work was contracted out to a specialised company, GTOI, thanks to funding from the DEAL.

The work to remove sprouts and regrowth is funded by the Departmental Council via European EAFRD funding.

Funding for uprooting work since 2012.

Year	Amount (€)	Origin of funds	Interventions
2012	3 850	Funded by ONF	Mapping
2013	19 716 5 320	DEAL Funded by ONF	Uprooting in Salazie
2014	15 800 3 880	DEAL Funded by ONF	Uprooting in Salazie
2015	20 580 4 560	DEAL Funded by ONF	Uprooting in Salazie
2016	14 260 5 420 19 527	DEAL Funded by ONF EAFRD	Uprooting in Salazie + Mafate
2017	16 493 3 000 19 527	DEAL Funded by ONF EAFRD	Uprooting of Salazie ramparts subcontracted to GTOI
2018	44 057 2 650 19 527	DEAL Funded by ONF EAFRD	Uprooting of Salazie ramparts subcontracted to GTOI

6, 7, 8. Uprooting work using mountaineering equipment.
9. Green waste in big bags.

Information on the project

■ Efforts to raise awareness were made in parallel with the management work. During monitoring work for sprouts and regrowth, any inhabitants encountered were informed on the risks of dispersal and in some cases people themselves uprooted plants observed near homes.

■ In 2014 and 2015, people were offered native plants in exchange for uprooting pampa grass from private gardens in order to avoid the spread of the private plants to the natural environments of Réunion.

■ Numerous press articles and reports on the invasion of the natural environment by pampa grass appeared in the local press (*Le Journal de l'Île*, *Réunion 1ère*, *Antenne Réunion*, etc.).

Outlook

■ Only a very small population of pampa grass in Terre-Plate (Salazie) has not yet be subjected to uprooting work. However, the work has been planned for 2019.

■ Site monitoring will be continued and any sprouts and regrowth will be uprooted by the ONF personnel, thanks to EAFRD funding.

■ The species is still present in a large number of private gardens. A procedure is now under way to prohibit the introduction and all uses of the species on Réunion, as per article L 411-6 in the Environmental Code. Work to remove the plants from the gardens of people who did not wish to voluntarily uproot the plants will subsequently be undertaken by the State in order to finalise the regional plan against the species.

Authors: Doriane Blottière, IUCN French committee, Julien Triolo and Dominique Chery, ONF, for the Resource Centre on invasive alien species in conjunction with the overseas IAS initiative. March 2019. Published by the French Biodiversity Agency.

10, 11. Unloading the big bags containing uprooted pampa grass and burial.

For more information...

■ ONF. 2016. Mise en œuvre du Plan régional de lutte contre l'Herbe de la Pampa à La Réunion. Actions 2016, compte rendu d'exécution. ONF et DEAL Réunion. 8 pp.

■ ONF. 2017. Mise en œuvre du Plan régional de lutte contre l'Herbe de la Pampa à La Réunion. Actions 2017, compte rendu d'exécution. ONF et DEAL Réunion. 8 pp.

■ ONF. 2017. Méthodes de lutte contre les plantes envahissantes, fiches techniques. Ile de la Réunion. ONF, Deal et Groupe espèces invasives de la Réunion. 35 pp.

■ AVE2M. 2016. Compte rendu action de lutte contre l'herbe de la Pampa 2015-2016

This management report fills out the collection already published in the second and third volumes of the book titled "Invasive alien species in aquatic environments, Practical knowledge and management insights", in the Knowledge for action series published by the French Biodiversity Agency.
(https://professionnels.ofb.fr/index.php/en/node/416)

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