Caladium bicolor

(Caladium bicolor)

Managing Caladium bicolor in the Mount Hachiroungou departmental forest (Mayotte)

Mayotte Environmental Directorate (DEAL), Environmental and Risk-prevention Service, Biodiversity Unit

■ DEAL operates under the authority of the Prefect and is in charge of formulating and implementing State policies in the fields of the environment, economic growth and sustainable development.

■ The mission of the Biodiversity Unit, among other objectives, is to implement data-gathering programmes, manage national action plans and IAS networks, set up protected areas, develop suitable management techniques and regulations, and protect remarkable sites and landscapes.

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Mayotte Departmental Council, Environmental Directorate (DEDDE), Environmental Service (SE)

■ This service is in charge of managing several sites owned by the French Seaside and Lake Conservation Trust in Mayotte. It organises the visitor service for the general public, site development, ecological restoration and the management and monitoring of fauna and flora, with particular emphasis on the protection of sea turtles.

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Mayotte Departmental Council, Land and Marine Resources Directorate (DRTM), Forest Service (SRF)

■ This service is primarily in charge of managing, protecting, developing and valorising the natural heritage of the departmental forests. Its three main lines of work are the protection of remarkable environments and species, marketing of forest products and welcoming the general public. The service actively monitors and reports on any offences committed in departmental forests and works to restore illegally cleared areas.

1, 2. Caladium bicolor plants in the Mount Hachiroungou departmental forest.

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Mascarin National Botanical Conservatory (CBNM)

■ CBNM is a non-profit founded in 1986. Its mission consists of gaining new knowledge, conservation, providing science advice and raising awareness concerning the issues dealing with the preservation of plants on the islands of Réunion and Mayotte and the Scattered Islands. It was in charge of the strategy against invasive alien plants on Mayotte from 2016 to 2018.

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Intervention site

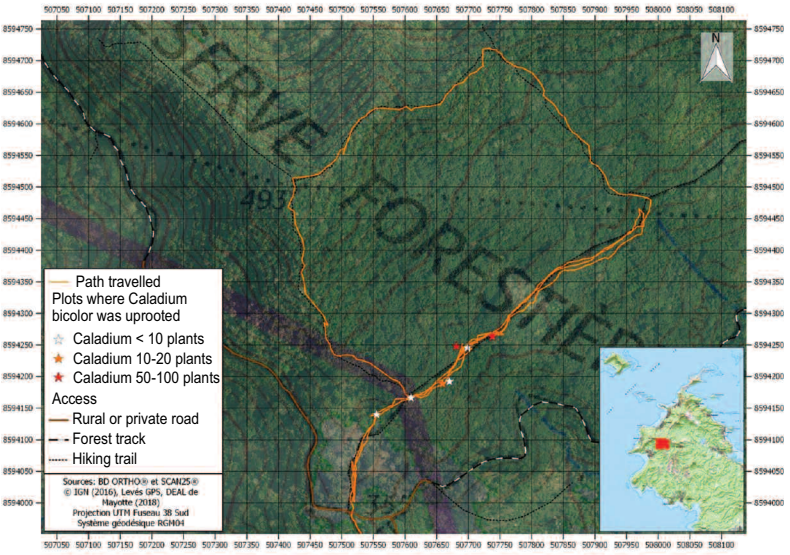
■ The species was discovered on 22 November 2018 by a DEAL technician during a project to map land use on the island.

■ The site is located in the northern section of the island, in the town of Mtsamboro, itself in the Mount Hachiroungou departmental forest, on leg four of the hiking trail, near the path leading up to the forest from Acoua.

■ Caladium is an ornamental plant commonly found in gardens and can easily colonise environments that have been severely modified by humans. This part of the hiking trail is heavily used by farmers in the area who lead their herds to the river that flows year round, between the trail and the forest track somewhat downstream. The movements of the livestock may disperse the plants from the environments impacted by human activities to the nearby natural environments.

■ The colonised area consisted of eight plots, five with less than 10 plants, one with 10 to 20 plants and two with 50 to 100 plants. The eight plots covered a total surface area of 20 square metres.

■ The plots are located in a section of the trail where a strong edge effect and easier access to light would suggest that the species is less likely to colonise heavily wooded areas where there is less light reaching the ground.



Plots where Caladium bicolor was discovered.

3, 4, 5. Uprooting bulbs and rhizomes.

Disturbances and issues involved

■ The Mount Hachiroungou departmental forest is a protected area that is home to several native species, some of which are endemic. It is one of the few environments that remain only slightly modified on Mayotte.

■ Caladium bicolor is a potentially invasive species (2P[1]) and had never been mentioned in the area previously. Rapid work to eradicate the species could avoid significant colonisation of the regeneration layer and subsequent risks for the survival of the forest. If the species were to proliferate, it could enter into competition for space and resources with the native species on the forest floor. That could result in a major reduction in forest regeneration via natural regrowth (seedlings) with a direct impact on the plant communities, the number of trees and forest structure and dynamics[2] in general.

1. Classification by Lavergne, 2016. 2P (potentially invasive species): cultivated, escaped from a garden/field or naturalised locally, invasive behaviour on one or two sites on the island, considered invasive elsewhere in the world (alien species of concern).
2. Forest dynamics consist of processes such as growth, death and regeneration of plants that modify environmental conditions and resources (quantity of light, soil aeration, litter quantity and quality, etc.).

Interventions

- Following detection by the DEAL technician, an early-detection report was filed in the framework of the strategy against invasive plants for Mayotte. CBNM was consulted in order to confirm the identity of the species and assist in determining the necessary management work.
- DEAL and the departmental services appointed to manage the early-detection system (SRF) and rapidly organise the work (SE) within the Flora Invasive Species Group for Mayotte (GEIM) set up a management programme as quickly as possible.
- The work took place on 19 December 2018.
- The bulbs and rhizomes of the plants were removed using pickaxes and shovels. Efforts were also made to find and remove any bulbs hidden underground.
- The green waste was removed in plastic bags to dry on the DEAL compound, a site removed from the natural environment. Transportation of the plants was made easier by the fact that the plots were located on the hiking trail near a track accessible to vehicles.
- The green waste was laid out on the DEAL lawns and monitored.

Results and costs

Results

- All visible plants in the plots, representing a total volume of approximately 90 litres (three garbage bags, 30 litres each) were removed and transported from the site.
- In the drying area, following a rainy period, some bulbs, even those cut into parts to accelerate the drying, rapidly developed rhizomes and sprouted. Subsequently, the green waste turned over twice and placed on a concrete floor to ensure complete drying with no regrowth.

Costs

- This work occupied four people (two DEAL personnel and two from the Departmental Council) for half a day.
- Beyond the time spent by the personnel, no further outlays were required given that all the necessary equipment was lent by DEAL, CBNM and the Departmental Council.

Information on the project

- An early-action report was drafted for this operation. It described the populations of plants and presented the people taking part, a simplified version of the interventions, the amount of work and how the waste was processed. The report was submitted to GEIM, the local entity in charge of efforts against invasive plants.

Outlook

- Monitoring has been planned in conjunction with other work in the area.
- Concerning the green waste produced by uprooting, it would appear preferable to place it immediately on a concrete surface or to dip it in salt water to avoid any regrowth.

6. An uprooted Caladium plant.
7. An unearthed Caladium bulb.
8. Bagged Caladium waste.
9. Drying the green waste

■ This operation was the first time that an early-detection report was made, followed by rapid organisation of the necessary work. It was a success given the rapid reactions of the partners and the quick launch of the work. That is an encouraging sign for future operations of the same type in Mayotte.

■ The momentum created by this operation led to the submission of a new alert for pine-cone ginger (*Zingiber zerumbet*) and bamboo (*Bambusa vulgaris*). The work should take place in 2019.

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For more information...

■ DEAL Mayotte, 2018. Report on an early-action operation. Operational strategy against invasive alien plants on Mayotte. 12 pp. (In French)

■ Lavergne C., 2016. Proposed hierarchy of invasive and potentially invasive alien plant species on Mayotte. Note on methods in drafting a hierarchical list of invasive alien species for their management. Version 1.1, November 2016. Note not published, National Botanical Conservatory and Mascarin Centre for Environmental Initiatives (CPIE), Saint-Leu, 56 p. (In French)

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)