

MANAGING THE PATHOGENS THREATENING ST HELENA'S BIODIVERSITY AND FOOD SECURITY

Locations	St Helena
Dates	15/09/2021 - 31/03/2025

Summary

St Helena's endemic trees and insects are under threat, possibly due to introduced pathogens or changes to the range of endemic pathogens due to climate change. This project will survey and identify pathogens associated with tree death (including nursery-raised stock) and insect populations. Additionally, crop diseases will be surveyed and their management assessed. Methods developed through CABI's Plantwise initiative will build capacity in diagnostics and management across all sectors, supporting growers, conservationists and foresters. This will prevent further deterioration of the endemic ecosystem, increase food production and reduce the necessity to import food.

The problem

St Helena's native cloud forest supports more than 250 endemic species making it the most biologically diverse location across the UK and its Overseas Territories. Endemic trees are the keystones of the forest, but in recent years significant numbers of mature trees (swathes of Cabbage trees) have suffered severe dieback, due to an unknown cause, impacting both tree populations and associated flora and fauna.

Fragile habitats like cloud forests are susceptible to disruption, particularly from invasive species. A 2020 survey by the St Helena National Trust revealed that

populations of some endemic insects were declining alarmingly fast due to infection by entomopathogenic fungi (fungi that attacks insects). The pathogen may be one of several recently arrived fungal species, or climate change increasing the severity and range of a native pathogen.

Additionally, growers have reported new problems in a variety of agricultural crops but have not been given any support as to how to deal with them. Traditional farming practices may not be appropriate for managing these emerging problems and growers need better information and improved practices.

Although the formal agricultural sector on St Helena is small, the informal sector supports many families with 76% of households routinely supplementing their diets with home grown vegetables and 2% being completely reliant on home production. The recent COVID crisis has shown the susceptibility of St Helena to the disruption of food chains and the need for improved food security. Relying on imports makes the cost of living volatile and the island has already experienced some food shortages and consequently significant price increases.

What we are doing

This project aims to identify the pathogens causing the emerging threats to livelihoods and biodiversity on St Helena and to develop sustainable management strategies.

This involves capacity building in diagnostics and management across all sectors, addressing knowledge gaps for growers (commercial and home), conservationists, agriculture and forestry staff. The project will tackle aspects of food security, habitat destruction and biosecurity through improved diagnostic capacity and demonstrating best practices for preventing and managing emerging problems. Improving agriculture is one route to providing for a healthy population and could potentially supply produce to the tourism sector.

One major activity will be to create a current database of pests and plant pathogens on St Helena targeting cloud forest trees, forestry trees and crop production.

The Birmingham Institute of Forest Research (BIFoR) will input into the identification of putative pathogens isolated from the forestry trees, largely through molecular biology methods.

Similarly, a survey of entomopathogenic fungi on native invertebrates will enable distinction between indigenous and introduced pathogens. This will provide an estimate of the threat of invasive pathogens to the native fauna.

Consultations will take place with part-time farmers on the island, in part by setting up a ‘plant clinic’ followed by the development of an action plan to mitigate threats with diagnostic tools and management techniques for newly discovered pathogens and their vectors and best practice guides for extension workers and conservationists. This will be complemented by capacity building and training of stakeholders across conservation, agriculture, biosecurity and forestry sectors in diagnosing pathogens and vectors, disease control and management techniques and laboratory diagnostic procedures.

Results so far

The project started in September 2021 but we hope to achieve a wide range of benefits.

Growers and farming advisors of the island who have received training will feel empowered to make diagnoses independently, they will better understand sources of infection and conditions likely to exacerbate the problem, leading to better management of the diseases.

The technical skills of scientists of the island will increase enabling them to confirm diagnoses and to identify newly arrived fungi that may pose a threat to endemic plants or crops alike. Better equipped lab facilities will significantly support on-island diagnostics and thereby reduce reliance on external support.

Assessing the causes of the tree dieback and surveying entomopathogenic fungi will set in motion short-term mitigation efforts to better protect the affected species. The incidence level of dieback will decrease over time due to improved habitat management, allowing a recovery of the keystone species and the whole forest system. Preventing the decline of the mature cloud forest trees will also lead to sustainable protection of the immense biodiversity of St Helena.

Food production will increase and there will be less reliance on imports.

Farmers and the whole island population will benefit from increased and more sustainable food security due to better disease control on the island with both yields and quality being improved. This in turn will improve the livelihoods both of farmers and consumers alike.

A visit by the project team to St Helena to conduct the first survey and to provide initial training is planned for February/March 2022.

Donors	The Darwin Initiative
Partners	St Helena Research Institute (SHRI), Environment, Natural Resources and Planning Directorate (ENRP), The Birmingham Institute of Forest Research (BIFoR)
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