CABI

SAVING TRISTAN'S ONLY NATIVE TREE AND ITS ASSOCIATED UNIQUE BUNTINGS

Locations Tristan da Cunha

Dates 01/07/2020 - 31/03/2023

Summary

Invasive non-native species are a major threat on oceanic islands due to their vulnerability and endemism, typical of island ecosystems. On Tristan da Cunha, a remote group of islands in the South Atlantic, Brown soft scale, (*Coccus hesperidum*), an invasive alien scale insect, has infested Tristan's only native tree, *Phylica arborea;* and is now threatening the extinction of one of Britain's rarest bird species*, Nesospiza* buntings. There is, therefore, an urgent need to find an appropriate method to mitigate the impact of the scale insects and prevent the total collapse of the *Phylica* forest. The aim of this project is to select and safely test suitable biocontrol agents to reduce scale numbers below a damaging threshold and safeguard Tristan's endemic buntings.

The problem

Invasive scale insects are known to have the potential to cause severe negative environmental impacts. For example, one species wiped out over 90% of the native pine forests of the Turks & Caicos. Brown soft scale (*Coccus hesperidum)* now risks causing the collapse of Tristan da Cunha's forest habitat which consists of only one tree species: *Phylica arborea.* The scale insect egests large quantities of honeydew which promotes the growth of black sooty moulds that smother the trees, reduces seed setting and ultimately kills them.

Tristan da Cunha's group of islands is also the home to endemic *Nesospiza* buntings, a group of rare bird species which have evolved into numerous different forms like the famed finches of the Galapagos. The buntings (*Nesospiza acunhae dunnei* and *Nesospiza wilkinsi*) have evolved specifically to specialise on *Phylica* fruit from the native tree, *Phylica arborea,* however, the introduction of scale insects has meant its habitat and primary source of food are being attacked, and, as a result, they are being threatened with possible imminent extinction.

A non-CABI field visit in 2018 to Inaccessible Island World Heritage Site, of the Tristan da Cunha, reported a significant increase in the infestation of brown soft scale, with the proportion of infected trees at monitored sites rising from more than 29% to 85-100% compared to 2011. Most concerningly, many of the largest trees had died, and fruit loads have fallen dramatically. The population of the endemic large-billed subspecies (*Nesospiza acunhae dunnei*), which rely on *Phylica* fruit, has fallen by over 80% at the main monitoring site.

Brown soft scale has recently reached Nightingale Island where it threatens the IUCN (International Union for Conservation of Nature) Endangered Wilkins' bunting (*Nesospiza wilkinsi*). There are only 100 pairs of the endangered Wilkins' bunting remaining, making the species extremely vulnerable to extinction.

The survival of the endemic buntings of Tristan da Cunha depends on the Phylica tree, making it an urgent need to find an appropriate control method to prevent the collapse of the *Phylica* forest and the spread of the New Zealand

flax, an invasive weed found on the island, into previously forested areas.

What we are doing

Classical biological control (CBC) will be used in this project as a safe and sustainable approach to rapidly address the problem. CBC has been widely, and successfully, used against scale insects, including work on the island of Saint Helena where endemic gumwoods were threatened with extinction by another invasive scale insect species.

The project will implement key actions of the 'Gough and Inaccessible Islands World Heritage Site management plan 2015-2020', and an action under the most recent 'Tristan Government Biodiversity Action Plan'. It will also help fulfil the 25-Year Plan commitment to prevent extinctions in the UK Overseas Territories.

Biological control has been proven to work for *C. hesperidum* both in indoor and outdoor environments. The aim of this project is to select and safely test suitable biocontrol agents (most likely small host-specific parasitoid wasps) and release at least one control agent in heavily infested *Phylica* stands. If successful, the agents will reduce scale numbers below a damaging threshold and safeguard Tristan's endemic buntings.

Results so far

The project started in July 2020.

Testing of a first biological control (*Microterys nietneri*) agent took place in the first year of the project. Cultures of host plants, *Coccus hesperidum*, and one parasitoid control agent were set-up within the quarantine facilities at CABI Egham. The efficacy of the control agents were then be tested under climatic conditions similar to the climate on Tristan da Cunha.

A first release of the control agent on Nightingale Island took place in April 2021 followed by additional releases later in the year. Further releases and testing of additional agents will take place until 2024.

Donors

Darwin Initiative

Partners

Tristan da Cunha Government, Food and Environment Research Agency (FERA), RSPB

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