

# THE REFORESTATION PROJECT ON SAN CRISTOBAL ISLAND

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San Cristóbal is the easternmost island of the Galapagos and also one of the largest. Rising to more than 700 metres above sea level, it has a wide range of vegetation types due to the variety of climate and edaphic conditions. It stands out among the archipelago's arid islands in having a relatively cool and humid climate and, in consequence, a plentiful supply of fresh water. It is the only island with permanent streams. The aptly named Freshwater Bay was one of the few reliable sources of supply for the whalers and other mariners. Even during the severe drought of 1984 and 1985, some creeks such as La Honda still had running water and indeed some of this water was transported to Santa Cruz when the usually adequate supplies from its own highlands failed.

The streams contain unique fauna including endemic shrimp and fish species as well as special algae. The terrain is also distinct from all the other islands; it has narrow gorges and waterfalls, where an abundance of mosses, ferns and flowering plants are found. The strong south-east trade winds carry humidity from the ocean up the ravines where their moisture condenses and forms dense mists, irrigating the lush vegetation and nourishing the streams.

Visitors accustomed to the heat and dryness of the other Galapagos islands can hardly believe the beautiful landscape, greened and cooled by mists. As they climb higher, the dense evergreen forest gives way to tall reddish shrubs with an abundance of purple flowers and blueberry-like fruits. These shrubs are the famous *Miconia robinsoniana*, found nowhere outside the Galapagos and even there, only on San Cristóbal and the highlands of Santa Cruz. At this altitude the climate is quite chilly and the strong wind which blows most of the year makes the survival of plants difficult; even with the help of high humidity and a number of sunny days, only *Miconia* and a few other shrubs manage to grow at this height.

At the very highest altitudes, conditions are too harsh for any shrubby plants, so herbs and ferns predominate. The only tall plant is the endemic Tree Fern, *Cyathea wetherbyana*. Due to the low temperature and extreme humidity, peat bogs are found in protected places.

If the vegetation around the creeks is removed, the humid air will no longer condense so effectively; the previously abundant water flow will be reduced and the catchment area disturbed if not destroyed as the humid air sweeps past over the devegetated ground. Unfortunately this is what has happened in some parts of San Cristóbal, which lie outside the National Park. Due to felling, the forests of endemic evergreen Sunflower trees (*Scalesia pedunculata*) of the Daisy family have almost vanished, while extensive grazing by cattle and goats has destroyed the unique highland vegetation of *Miconia* and *Cyathea*. In consequence there has been a dramatic decrease in recent years in the flow of some streams including La Toma, which supplies the human population of the island with fresh water. Expensive dams and pipes were constructed to ensure that the towns of Progreso and Puerto Baquerizo had a sure supply of water throughout the year but even this failed completely during the recent prolonged drought. So the local authorities and the Charles Darwin Research Station together embarked on a reforestation project to create ecological conditions that would guarantee an adequate supply of water even during dry periods. They were joined in 1985 by the Technical University of Esmeraldas and more recently by the CDRS scholarship student who is the junior author of this article. The area chosen for the first reforestation scheme was in the La Toma catchment area, close to the Cerro San Joaquin, the highest point in the island. This large area at an altitude of some 600 metres is now dominated by cattle pasture and the introduced Common Guava (*Psidium quajara*). The composition of the original vegetation cannot now be ascertained with any certainty but there are still a few remnants of *Miconia* shrubs in the higher parts and of *Scalesia* lower down. It was decided to try to reforest the area with these two species. A small nursery was established in early 1986, and a shelter was constructed and four workers permanently employed. The main aims for that year were to discover the optimal conditions for producing seedlings and to make small experimental plantations. This should reveal the preferred altitude for raising each of the two species. In 1987 it is planned to establish much larger pilot plantations, each of several hectares. The first results at the nursery were very promising, indicating that the propagation of both *Miconia* and *Scalesia* from seeds is possible. Seeds of the former are plentiful but seeds of *Scalesia* are sparse as so few specimens have been left in the island. But production of both species has begun and there is confidence that the ambitious plans for the next few years will be realised.