

Forest Recovery

Cloudbridge Nature Reserve - Nature Notes No. 3

Cloudbridge was created to help bring back Costa Rica's magnificent cloud forest. We are planting many native trees to assist in this recovery. But what about unaided regrowth? Won't the forest recover on its own, if left alone?

Nature is resilient and natural disturbances are part of the life cycle of all ecosystems. After a disturbance, human or natural, a recovery process called succession will begin to take place. Recovery of the forest will start in two ways: seeds dormant in the soil will start to germinate, and new seeds will enter from surrounding areas. The rate of recovery will depend, in part, on the availability of seeds which in turn depends on the proximity of other forest species, and the availability of animals, such as birds, sloths and monkeys, to disperse seeds.

Abundant water The fact that Cloudbridge is surrounded by forest means that it will recuperate faster than in other areas where deforestation is more extensive. The recovery process follows a successional pathway, whereby early species (called pioneers) colonize the soil and make it suitable for other forest species. Pioneer species must be able to tolerate high light intensities and high temperatures (because there is no longer any forest to provide shade).



They must also be good dispersers, and able to arrive at a new site. Seed dispersal by bats and birds is very important in the recovery of tropical forests. Species such as *Cecropia* are early pioneers, they are light tolerant, and their seeds are dispersed by a variety birds and bats -- an estimated 76 species of birds feed on *Cecropia*.

Other pioneer species, such as the *Heliocarpus* one sees near the Chirripó river, have seeds that are long-lived in the soil, and that can survive a wide variety of soil environments. High light levels, and high temperatures often stimulate the germination of these seeds. *Heliconia* (the name means sun-loving) and some fern species will colonize large disturbed areas, if sufficient water is present. Once these pioneer species have established, their shade often prevents other members of the same species from germinating and surviving. In their place emerge shade tolerant trees, such as *Tirra* (*Ulmus*) and *Cedro* (*Cedrela*), and arid plants (ones that do well in dim light and high moisture such as the swiss-cheese plant *Monstera*, and *Philodendrons*). Thus the forest gradually increases in diversity. Studies in Puerto Rico show that some forests recover from hurricane destruction in about 40 years. However full recovery of a landscape that has been completely denuded of forest species is likely take considerably longer.

