



## Cassowaries help spread rainforests

Sorting through cassowary dung may seem a strange occupation to some. But to Mr Geoff Stocker and Mr Tony Irvine, of the CSIRO Division of Forest Research's station in Atherton, northern Queensland, the task has provided proof that this flightless bird is an important means of dispersing rainforest plants.

Mr Stocker and Mr Irvine collected cassowary dung piles near a logging road through the foothills of Mt Bartle Frere for 2 years. During this period, they identified seeds of 78 plant species in the samples. Generally the droppings contained a mixture of fruit from several species — such as laurels, lily-pilly, figs, and quandongs — but on some occasions seeds and fruit fragments of a single species made up most of a month's collection.

Cassowaries seem to be scavengers, depending mainly on fruit that falls from high up in the rainforest canopy. They rarely eat any directly from branches within their reach. The CSIRO researchers noticed that many of the greener, immature fruits that the birds scavenged appeared to pass through the cassowary intact.

Mr Stocker suggests that this may be due to a 'gentle' digestive mechanism that protects the birds from poisonous compounds in the seeds. Such a system would also ensure that even seeds

with very thin outer coats can pass through a cassowary undamaged.

As part of the study, seeds from the dung samples were tested for germination ability. Only nine of the 78 species failed to produce some seedlings and, of the nine, seven were represented by only six seeds each.

The undigested fruit flesh passed with the seeds may help germination by retaining enough moisture to prevent vulnerable seeds being killed by drying out during the critical early establishment phase. The two scientists noticed that the fresh dung also appeared to keep rats away.

Once a seed germinates in a dung pile, it faces strong competition from others of its own and other species. Larger seedlings tend to grow more rapidly and shade out competitors. In fact, larger fruits seem to depend more on dispersal via cassowaries than smaller ones, which can be dispersed by a variety of fruit-eating animals.

Are cassowaries long-distance seed dispersers? Mr Stocker and Mr Irvine had little biological data available to assess the extent of the birds' daily and seasonal movement. One report in 1930 claimed that a captive cassowary retained seed from a fruit for nearly 11 hours. An even earlier study proposed that cassowary territories range from one-half to 2 square miles.

The CSIRO researchers suggest that seeds may move across unfavourable environments via cassowaries. One example occurs in the open eucalypt woodland in northern Cape York Peninsula. Seeds from the 'gallery' rainforest along the banks of a river may hitch-hike with cassowaries across open areas to the next stretch of rainforest. These large birds could even have carried plant species between Australia and

The seed-carrier — a Queensland cassowary.



Silver quandong seedlings that have germinated from a dung pile.



A pile of cassowary dung containing seeds of the Queensland walnut (foreground) and Kuranda quandong.



New Guinea in prehistoric times when Torres Strait was shallow and dry — such conditions existed as recently as 8000 years ago.

Like most fruit-eating birds, cassowaries are attracted by the bright orange and red colours, not the smell, of fruits. Bats, which also act as important dispersers of rainforest seed, more often eat dull-coloured fruit. They are attracted to the musty or turpentine smell of these fruit. No large mammals eat the native fruit from this region of northern Queensland. Man is the only possible contender, and his taste usually stops at bananas and mangoes.

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Seed dispersal by cassowaries (*Casuaris casuaris*) in north Queensland's rainforests. G.C. Stocker and A.K. Irvine.

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