

CARING FOR CASSOWARIES IN POST-CYCLONE TIMES

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Ecology

The southern cassowary (*Casuarius casuarius johnsonii*) is an iconic bird, endemic to North Queensland. It occurs in three broad populations. In the Wet Tropics area, from Townsville to Cooktown, where about 89% of their remaining habitat is within protected area estates. However the habitat in this region has been greatly reduced by land clearing, so cassowary numbers have decreased. On the Cape York Peninsula, a southern population is found in the vine forests of the McIlwraith and Iron Ranges and a northern population in the less extensive vine forests north of Shelburne Bay. All populations are considered threatened, but the Wet Tropics population is at greater risk and considered endangered. The species is listed as endangered under the *Environmental Protection and Biodiversity Conservation Act 1999*.

Like the emu and ostrich, the southern cassowary is a ratite; a large flightless bird with unusual feathers and other features that distinguish it from all other birds. Adult birds have black glossy plumage, a brown casque on top of its head, a blue neck and dangling red wattles. The purpose of the casque is unknown but it may indicate dominance and age, as it continues to grow throughout life. Recent research indicates it may also assist cassowaries in "hearing" the low vibrating sound made by other cassowaries. The casque and wattles are unique to each bird and are utilised as features in indentifying individual birds.

Adult cassowaries can grow up to 2m tall and weigh up to 80kg, making it our heaviest bird. The sexes are similar in appearance however females are larger with males being slightly smaller, weighing up to 55kg. Cassowaries have strong muscular legs with three forward facing toes. The inner toe on each foot has a dagger like claw that can measure up to 120mm long and is used in fighting aggressively with other birds, resulting in significant injuries and mortality.

Newly hatched chicks are a brown colour with creamy white stripes, with an orange brown head. After approximately three to six months the stripes fade and the plumage changes to a light brown colour, at this stage they are classified as juveniles. As the young mature, the plumage darkens, the wattles and casque develop and the skin colour on the neck and wattles brighten. At this stage the cassowary is classified as a sub-adult. After about three years of age the cassowary is considered mature.

Cassowaries prefer fallen fruit, but will eat small vertebrates, invertebrates, fungi, carrion and plants. Over 238 species of plants have been recorded in the cassowary diet. Cassowaries play an important role in maintaining the diversity of rainforest trees, they are one of only a few frugivores that can disperse large rainforest fruits and are the only long distance dispersal vector for large seeded fruits.

Usually solitary animals, cassowaries live in a home range that fluctuates depending on season and availability of food. The sizes of observed home ranges average about 0.52km² to 2.35km². Female cassowaries tend to have overlapping ranges with several males. Cassowaries are territorial and contact between adults generally only occurs during mating. From May to November, pairs of cassowaries' court briefly, mate and then separate. A female can mate with several males in one season.

Females lay between three to five large, olive-green eggs, generally between June and October. Eggs are incubated by the male for about 50 days, who alone guards the eggs and raises the chicks. Juveniles begin to fend for themselves from about eight to 18 months of age, when they are chased away by the male.

Threatening Processes

A number of factors affect cassowary survival. The major threats include the loss, fragmentation and modification of habitat, vehicle strikes, dog attacks, human interactions, pigs, disease and natural catastrophic events.

Once common in far north Queensland, the cassowary's traditional feeding grounds, particularly the coastal lowlands have been seriously reduced by land clearing for farming, urban settlement and other development. Most of their lowland habitat has been cleared, and urban development threatens the continued existence of local populations outside of protected areas.

Cassowaries are sometimes killed when crossing roads. In the Mission Beach area, road accidents are the greatest single cause of cassowary deaths. Roads cut through cassowary territories, making it necessary for the birds to travel across them when looking for food. People often hand feed the birds from cars, attracting them to roads, sometimes with fatal results. Even littering, by tossing rubbish out of cars, can attract birds to the roadside and lead to their death.

Unrestrained and wild dogs are a major cause of cassowary deaths, particularly in areas near residential development. Chicks and sub-adults are small enough to be killed by dogs. However, packs of dogs also kill adult birds, pursuing them until they are exhausted, and then attacking them. Dogs also indirectly affect cassowaries through their very presence, influencing the feeding, movements and general behaviour of the birds. Pigs cause disturbance to the rainforest and compete with cassowaries for fallen fruit. They may also eat cassowary eggs and destroy nests.

Hand-feeding of cassowaries is a risk to both birds and people. Wild cassowaries conditioned to human food sources can be aggressive when protecting themselves or their chicks or seeking other human food. As birds become less wary of humans, they may become more vulnerable to dog attack and road mortality as they move around looking for food.

Tropical Cyclones and Cassowary Management

In recent years, cyclones have damaged large areas of cassowary habitat, causing temporary food shortages. This places further stress on local populations already dealing with other threatening processes. The change to the cassowaries' habitat forces them away from usual and familiar movement patterns. Cassowaries will instead make use of roads, highways, tracks, and other areas to move around, which increases their exposure to a number of potential threats.

In March 2006, Cyclone Larry crossed the coast near Innisfail causing substantial destruction to the forests. In response to this, QPWS set up a supplementary feeding program to support affected birds and help manage the interaction between displaced cassowaries and people. During this time 61 feeding stations were established and the program ran for 18 months.

Five years down the track in February 2011, Cyclone Yasi crossed the coast near Mission Beach. Due to the sheer size of the cyclone and its path, a larger proportion of the habitat that supports the endangered southern cassowary was for a second time, damaged.

A similar approach to the Cyclone Larry response was adopted for Cyclone Yasi. Within two weeks a supplementary feeding program was implemented, built on the lessons learnt from Cyclone Larry. At the height of this program over 100 feeding stations were established in a broad coastal strip from Innisfail to Cardwell.

The aim of the supplementary feeding program was to use feed stations to provide fruit as the forest recovers and to draw birds away from threatening processes. Feeding stations were established where needed and sites were assessed and chosen according to known cassowary movements and to minimise the risk to the birds and the public by drawing the cassowaries away from roads and urban areas.

Feed stations were supplied with fruit approximately every three days, and amounts were varied to ensure the birds maintain their natural foraging. Feed stations consisted of 40L rectangular tubs suspended 1m from the ground between pickets. This design allowed cassowaries to feed while excluding pigs.

Part of the exit strategy from the supplementary feeding program includes the collection of cassowary scats to monitor the uptake of native fruits and the effectiveness of feed stations as the program progresses. These scats were also sent to CSIRO's Sustainable Ecosystems for DNA analysis to identify individual birds, family groups, breeding patterns, birds' movements and numbers within specified areas.

In addition to this, several transects were set up during the period of the feeding program, to monitor fruit production within the area and to provide some correlation with the scat analysis data. QPWS Rangers also collected data on the availability of cassowary food plants in the broader area of the feed stations.

Remote infra red cameras were set up at feeding stations during the program and especially during the exit phase. The cameras provide valuable information on the cassowaries utilising the feed stations as well as their condition and foraging behaviours. It is possible from this camera data to identify individuals and track their condition over time. This information will also provide better estimates of cassowary numbers in small areas such as Mission Beach.

After 16 months, Rangers are continuing to supply fruit to some feed stations but we are progressively exiting from the feeding program and reducing the number of feed stations where cassowaries are no longer using them and where natural fruit levels are adequate.

In the program's early phase, retailers Coles, Woolworths and Bi-Lo donated second fruit and the conservation organisation Rainforest Rescue donated \$10,000 to the feeding program.

Residents and visitors within the effected area also played an important role in the response program. A cassowary hotline and email was set up to encourage the community to report sightings and incidents involving orphaned, sick or injured cassowaries.

In the last 16 months over 167 tonnes of fruit has been delivered to the feed stations and community volunteers have provided over 3300 hours of support work with cutting up of this fruit. In addition to the volunteers' efforts, 55 private landholders have feeding stations on their properties, with permission from QPWS.

Cassowary Rehabilitation Facility

A recovery plan has been developed for the southern cassowary and is the major planning mechanism directing cassowary conservation effort. It sets out actions to secure the long-term protection of cassowary populations through improved habitat protection and enhancement, threat abatement and community engagement programs. One objective under the Cassowary Recovery Plan is to progress an effective cassowary rescue, rehabilitation and release program. Given the threats to the species and the potentially aggressive nature of this animal, care and rehabilitation is managed and implemented by QPWS personnel who have received appropriate training in working with cassowaries.

The Garners Beach Cassowary Rehabilitation Facility (GBCRF) was established to provide intensive care and rehabilitation for sick, injured or orphaned cassowaries. The rehabilitation facility has been in operation for over 12 years and consists of six different enclosures, including a quarantine enclosure. The facility becomes critical after destructive events such as cyclones as the need for care increases. These large enclosures can be temporarily split to accommodate for increased demand and care. For instance since Cyclone Yasi, 17 cassowaries have been admitted to the facility for either short term or long term care.

Birds which require longer term care are often chicks or younger juveniles, these birds are often orphaned due to traffic strike, dog attack or abandoned by the parent. The care of these birds is often labour intensive initially but as the birds mature contact with staff is diminished as much as possible. The diet, behaviour and condition of the birds are consistently assessed over time by an experienced vet and staff to monitor the birds' welfare and development, with the aim to release the bird back into the wild near its paternal range.

For the last couple of years QPWS have also been participating in a collaborative research program with the University of Queensland on attaching GPS based telemetry devices onto rehabilitated birds before they are released back into the wild. This provides us with information on the welfare of the birds, movement patterns, dispersal distances, habitat use and the spatial and temporal scale of establishing a consistent home range.

To report a sick, injured or orphaned cassowary, call the QPWS Wildlife Hotline on 1300 130 372 or to report a cassowary sighting, please email cassowary.sighting@derm.qld.gov.au

KYLIE GOODALL: Kylie Goodall worked as a QPWS Resource Ranger in Innisfail prior to joining the Cassowary Response Team formed in 2011 in response to Cyclone Yasi. Kylie graduated from Griffith University with a B.Sc in Ecology with honours in bird behaviour and has more than 10 years threatened wildlife experience working with independent, non-profit organisations and various government departments. This work has included threatened species reintroductions, captive breeding programs, and the monitoring of wild and reintroduced populations through survey methods, including radio tracking.