# *Gouldian Finch Recovery Project*

Introduction

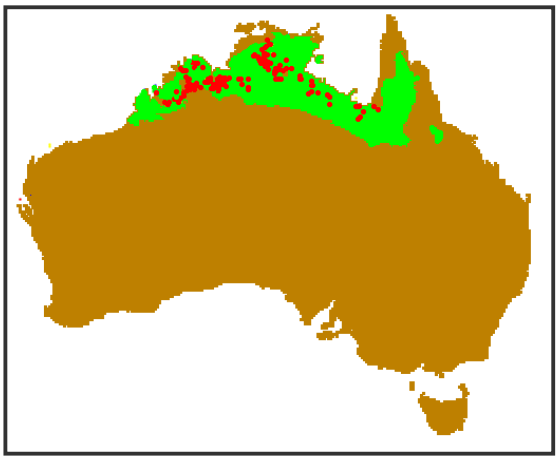
**Background and history**

The Gouldian Finch *Erythrura gouldiae* (Gould 1844) is a small granivorous bird endemic to the savanna woodlands of northern Australia. The species has declined in abundance throughout its former range and is now locally extinct in many areas (Blakers *et al* 1984). Range contraction has been most apparent in the eastern portion of the former range (Queensland).

*View of Study Area and woodlands*

The Gouldian Finch was once amongst the most common finches of the northern savannas, but has declined throughout this century. Large flocks of Gouldians were apparently a prominent feature of the landscape (Heumann 1926), and large numbers were harvested for the local and international captive bird trade until the early 1980s. Populations are now sparsely distributed and sightings of even small numbers of birds are rare in most parts of their former range.

Initial concern that populations of grass-finches were in decline was expressed by residents in the Katherine region of the Northern Territory. This concern resulted in a brief investigation by the Commonwealth conservation agency which recommended funding research on the comparative ecology of savanna grass-finches with emphasis on the Gouldian Finch and the Pictorella Mannikin (Forshaw 1979). Comparative studies of grass-finch ecology commenced in 1986 and resulted in a number of contributions to the knowledge of these species (summarised in Tidemann 1996).



*Present distribution of Gouldian Finches is shown by red dots. Green area depicts historical distribution.*

The Gouldian Finch was listed as Endangered in 1989 following a submission by scientists from the Wildlife Research Unit of the (then) Conservation Commission of the Northern Territory. The submission cited evidence of range contraction (e.g. Blakers *et al* 1984), anecdotal and quantitative evidence of population decline. Data from the returns of licensed finch trappers operating in the Kimberley region of Western Australia suggested a rapid decline in Gouldian Finch populations throughout the 1970s that was not evident for other species, and prompted the prohibition of trapping for this species after 1981.

More recent reviews have confirmed the Endangered status of the Gouldian Finch (Garnett 1993, ANCA 1994, Collar *et al.* 1994). In 1993, a species recovery process was initiated for the Gouldian Finch with funding commitments from the Endangered Species Unit of the Australian Nature Conservation Agency, the (then) Conservation Commission of the Northern Territory and Pegasus Mining (originally Zapopan), the operator of the Mt Todd gold mine in the Northern Territory. A Recovery Plan for the species was compiled by the Gouldian Finch Recovery Team, led principally by Dr J. Woinarski of the (then) Conservation Commission of the Northern Territory. This version of the Recovery Plan was endorsed by the Gouldian Finch Recovery Team meeting in October 1994.

The national Gouldian Finch Recovery Team includes representatives from the Commonwealth conservation agency (Threatened Species and Communities Section of Wildlife Australia), state and territory conservation agencies (Conservation and Land Management Department of Western Australia, Parks and Wildlife Commission of the Northern Territory and Queensland Department of the Environment), non-government organisations including the Royal Australasian Ornithologists Union, the Threatened Species Network, and an aboriginal association (Jawoyn Association).

**Objectives**

- To save the endangered gouldian finch from extinction by:
- finding the cause of the decline (both in numbers of populations and individuals within populations)
- implementing an immediate proactive stance in promoting the recovery of the species

**What is a Gouldian Finch?**

- Australia's most beautiful bird
- small seed-eating bird (granivorous) weighing about (15 g)
- were one of the most common species throughout northern Australia
- one of the world's most common species kept in aviaries
- **ENDANGERED**

**Red-Faced Male Gouldian Finch**

**Black-Faced Male Gouldian Finch**

**Red-Faced Female Gouldian Finch**

**Black-Faced Female Gouldian Finch**

**Juvenile Gouldian Finch**

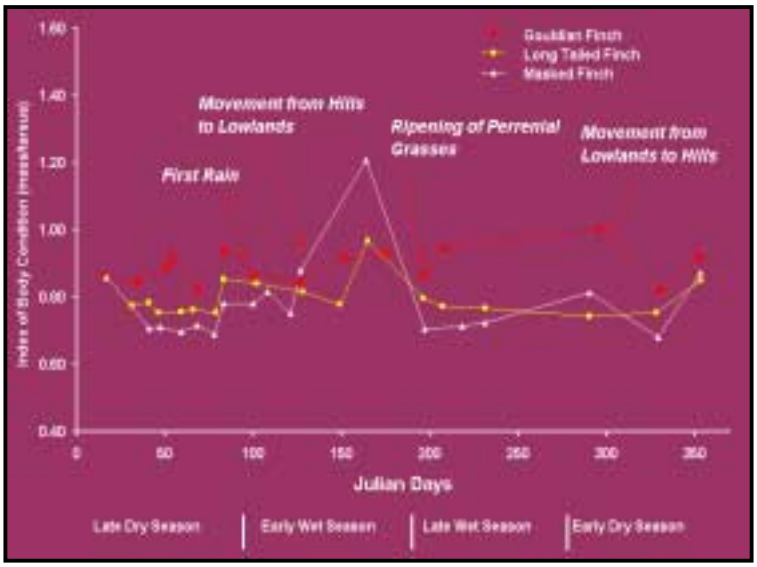
**What do we know so far!**

During the past two years our research has focused upon gaining a better understanding of wet season ecology. Gouldian finches occupy two different regions of the landscape on an annual cycle. In the dry season and part of the late wet season, between February and October they live within wooded hills that contain *Eucalyptus* trees used for nesting. During this period they feed upon native sorghum and drink at small rocky waterholes that remain in the hills until the next wet. In the wet season gouldians move from the hills into lowland drainages to feed upon perennial grasses that begin to seed in mid December.

These grasses include soft spinifex, cockatoo grass and golden beard grass. This is a period of abundant fresh seed that arrives after the dry season reserves of sorghum have disappeared.

**Theory**

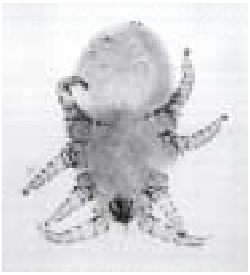
The decline of gouldians has occurred throughout the specie's distribution. This is a significant observation because it suggests that the cause for the decline has also occurred throughout the same distribution suggesting that a major event has influenced the success of the entire species. Previous research had suggested that the dry season did not appear to pose environmental hardships for the gouldian finch. Gouldians reproduced freely, had abundant stocks of sorghum seed and water. However the wet season may be a difficult period. We have found that there are periods of low seed availability between the first heavy rains and the first seed produced by perennial grasses. That same period is also the time when gouldians moult into a completely new compliment of body feathers, unlike any other finch species in the region. Also supporting this is evidence showing that unlike other species of finch living within the same locality, gouldians do not increase their body condition during the wet season. These observations suggest that the wet season ecology of the gouldian finch may hold the key to understanding the cause for the decline.




*Analysis of body condition in finches throughout the year indicates that species such as masked finch (black triangles) and long-tailed finch (yellow circles) increase their body mass during the wet season. Gouldians (red diamonds), however do not display significant increases in body mass. This absence of seasonal conditioning may have direct consequences resulting in lower survival during the next dry season and lower reproductive output.*

In the past it has been suggested that causes for the gouldian finch decline may have been as a result of large scale commercial trapping for the pet industry or because of the air-sac mite ***Sternostoma tracheacolum***. It may also be that mites and trapping have only added to the problem. Legal harvesting of gouldian finches ceased more that 20 years ago yet the species still declines. Large-scale trapping may have increased the rate of a decline that was already occurring. The appearance and apparent increase in the number of sick birds suffering from air-sac mite infection may well be because gouldians are low in immunity as a result of some other major event such as starvation.

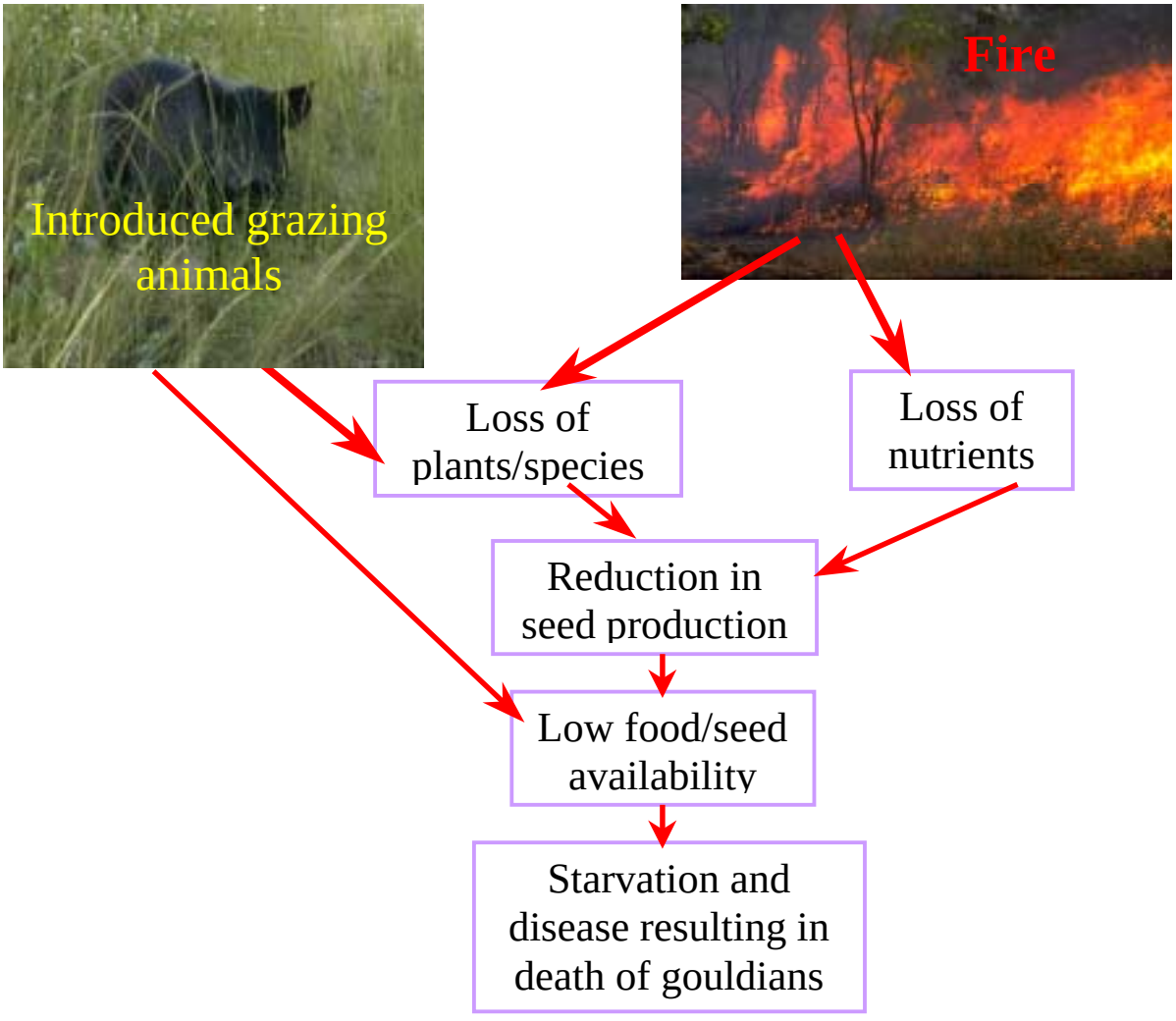
Air sac mite
*Sternostoma tracheacolum*



This has lead to the following theory.

**Environmental Change**
→ **Lower food availability**
→ **Poor health**
→ **Disease**

The next important question is to ask what sort of environmental change or changes could occur over such a vast area that results in significant reductions of seed yield.



There are a variety of factors that appear to have the potential to influence the seed yield of native grasses. Current research suggests that the two most important of these are grazing animals and fires. Grazing animals, particularly feral pest species such as horses and pigs destroy large tracks of wet season gouldian feeding areas. The destruction is caused in two ways, firstly by pigs digging up perennial tussocks and eating the roots and secondly by horses eating both the leaves and immature seed stems before seed has been set.

*Cockatoo grass is destroyed by feral pigs as they dig for the nutritious roots*

Fire also appears to play a major role in determining the yield of seed plants are able to produce, however this is far more complicated and difficult to observe because the effects may not be apparent for several years. Firstly fires may directly reduce the number of surviving plants and plant species within an area. This does not necessarily occur in the first year but may be a gradual process where the nutrient reserves held by the plant are continually used as a result of successive annual burns. Eventually these reserves are depleted to a point where the plant dies. Unfortunately while these nutrient reserves are being used the plant is also producing less and less seed. Less seed and gouldians as well as other finches starve. Secondly, annual burning over many years can reduce the available nitrogen in the soil, which could reduce the seed yield. It has also now been observed that some grass species such as soft spinifex do not set seed the year after a fire. Again the result is no food for the gouldians.

*Regrowth of soft spinifex a year after burning and lacking seed stems. Importantly note the lack of seed stems.*

*Healthy, seeding spinifex two years after burning. Note the abundance of seed stems that contain essential resources for gouldian finch survival.*

Of course this is only a brief outline of where our research is pointing, but we are now investigating the full potential of the role fire plays in shaping the ecology of northern Australia, especially with regard to the gouldian finch. Some of our present research is experimentally manipulating nutrients, fire and grazing on plants in both field trials and in shade houses. At the same time we are monitoring the success of different gouldian populations living with different fire regimes. We have also begun an extensive program of protective fencing to save crucial areas of grassland from pig and horse damage.

**Waterhole Counts**

Why do we count gouldians?

- Assess population size
- Assess the impact of experimental management
- Provide avenues for public involvement

Where?

Waterhole counts are conducted in the Yinberrie Hills, about 45km north of Katherine in the Northern Territory. This is in the heart of the gouldian distribution and where the majority of research data has been collected to better understand the ecology of the gouldian finch.

*View of Yinberrie Hills from Cannyes Hill at the edge of the Edith River. This area of the study site holds the greatest numbers of gouldian finches.*

*One of the fenced enclosures used to protect vital beds of cockatoo grass from feral pigs. Without fencing and eradication of feral animals it is probable that grass areas like these will only be found in the future as remnant patches so small as to be of no value for finches.*

When?

Counts are conducted in the late dry season which corresponds to southern Australia's winter. The reason for this timing is because water becomes scarcer as the dry season progresses leaving birds with fewer places to drink each morning. Thus, birds become concentrated at small isolated waterholes and our estimations are more accurate.

Where?

During our week of gouldian watching we stay in Nitmiluk National Park. Camping sites are provided at the Ranger Station, but you are expected to bring a tent, sleeping bag & swimmers.

*Edith Falls – safe swimming and a wonderful place to relax after a long day. We provide the food, atmosphere and good company.*

*The team relaxing after the morning's waterhole counts*

*Sunrise over the hills. The mist reveals that the mornings can be a little chilly!*

Daily Routine

After an early morning rise we drive into the hills and each person sits at their allotted waterhole. We start recording at 07:00 and finish at 10:00. Seasoned WHW (waterhole watcher's) bring a chair, binoculars, hat & insect repellent.

*The morning's essentials.*

*The mornings can be a little chilly and some waterholes are a small distance from vehicle access so it is advisable to bring warmer clothing and a good set of boots. A small pack (not a plastic shopping bag) is essential for carrying other items such as snacks and water. Don't forget your camera!*

*The alarm clock is essential because we need to be out of bed before dawn. A watch is essential because we tally our counts every fifteen minutes. Anyway if you do not bring a watch you will not know when it is time for morning tea.*

Within the study area we have about 100 waterholes that are regularly censused for the presence of gouldians and other species of finches. These waterholes range in size from very tiny (hand basin size) to much larger (large swimming pool).

*Even the smallest puddle is important for a gouldian*

*Larger waterholes also receive visits from gouldians as well as larger birds such as northern rosellas and Jabiru*

Data collection is simple. At each waterhole we record how many gouldians and other finch species drink within each 15 minute period. These numbers are then tallied and an estimate of the population size frequenting those waterholes can be made.

*There are also plenty of other birds to see as you sit and count*
*Can you spot the gouldian?*

After we return from the morning's activities there is usually time for a swim and lunch. We then spend the afternoon in a variety of activities including waterhole mapping, vegetation mapping or even fencing.

*Our volunteer, Ci Ci working with a GPS*

**Radio Tracking**

An important tool in gaining a better understanding of the gouldian's ecology has been the use of radio telemetry. Because of this innovation we have been able to monitor the daily home ranges of individual gouldians in country that was totally inaccessible to vehicles and virtually impossible to walk through.

*Monsoonal storms sweeping across the Yinberrie Hills.*

During the 1999 – 2000 Wet season, fieldwork focused on tracking the daily movements of gouldians and learning about what species of grass were used as food sources. This was a resounding success through the aid of transmitters. Very small transmitters (0.62g) were attached to several birds using a harness made from surgical suture. This method of attachment is ideal for small birds because it allows the transmitter to be positioned on the

back of the bird close to the centre of gravity (causing minimal disturbance to flight capability). The suture material also disintegrates within a short period causing the transmitter to drop off if the bird has not already been recaptured.

*Red male gouldian with a transmitter attached to his back.*

After the transmitter was attached daily monitoring took place at half hourly intervals from 5:00 am until 7:00 pm (unless lightening from wet season storms forces us to depart earlier). This provided us with about 20 locations for each bird for each day of recording. These were very long, hot days, but we had friends to keep our minds on the job!

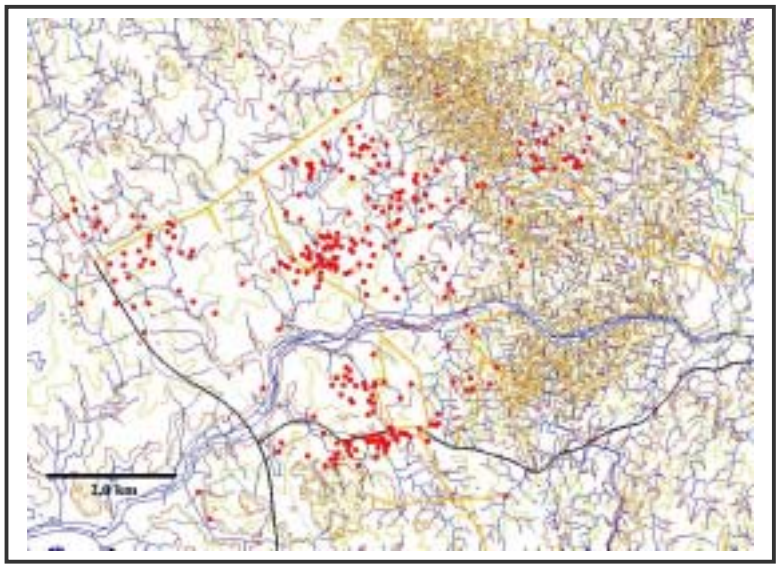
The monitoring took place at three radio-tower stations, simultaneously. This allowed us to use a triangulation method to later map exact locations of focal birds. The towers were 12m in height with twin five element Yagi antennas mounted at the top.

*After all that effort the tower is finally in position*

As can be seen by the previous photographs, a great deal of effort was required while setting-up each tower. Thanks to many volunteers we have had only one mishap after moving towers more than 20 times during the field season.

After several days of tracking we were able to produce maps with the half hourly locations of each bird. These locations provided us with feeding sites that we were able to visit later and protect for future generations of gouldians. We were also able to measure the distances that individual gouldians moved while searching for food, which will enable us to plan management strategies for the protection of entire populations.

*Map of study area with red spots representing gouldian finch locations*



## Coming Events

- 26th August – 2nd September 2001, Yinberrie Waterhole Count
- 1st October – 30th November 2001, Radio Telemetry
- December 2001 – March 2002, Revegetation Program planting native perennial grasses and fencing crucial feeding habitat.

## Research Team

Milton Lewis

Milton has studied a variety of bird species before commencing work as research coordinator on the gouldian finch recovery project. Most recently he investigated the polygynous mating system of golden headed cisticolas for his PhD dissertation, but has also worked on superb fairywrens, southern stone curlews, black-throated finches and golden whistlers.

David Hooper

David has been a member of the gouldian research team for a number of years. His previous experience in using radio telemetry with other species such as Partridge pigeons has been invaluable to the success of our fieldwork.

**Contact Details**
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