

Issue 2

July 1993

An occasional newsletter about the Golden-shouldered Parrot produced by Gabriel Crowley and Stephen Garnett.

This newsletter is for the many people who have shown an interest in the research on the Golden-shouldered parrot since it began in August 1992. The work is being conducted with funding from the Queensland Department of Environment and Heritage and the World Wide Fund for Nature (Australia) and is due to run for three years. In the first issue we gave an outline of the history of Golden-shouldered Parrot research and a summary of what we had done in the first six months. In this letter we describe what we saw in the breeding season and some of the work being done by our many collaborators towards the parrot's conservation.

After nearly a year of research on the Golden-shouldered Parrot we have been able to build up a model for testing. First the distribution of the parrot has contracted and, in at least some of the areas from which the species has disappeared, the habitat has also changed from open flats lined with termite mounds to tea-tree woodland without termite mounds. Other areas from which the parrots have disappeared have a history of heavy trapping.

Breeding success, however, does not appear to be a problem, with the population probably at least doubling immediately after each breeding season. Nor does food appear to be limiting in the dry season. Initial studies of dry season diet, including that fed to nestlings, is that food of high quality is available from at least

early March to the first heavy rains at the end of the year. The main foods used are fire SOMEONE'S MATCHING grasses, Shyzachyrium spp., These are among the most abundant grasses in the region. This means that most mortality occurs in the wet season. Our studies of the Hooded Parrot show that they have to eat low quality food at this time of year, including several food types that are not available on the Cape. Absolutely crucial to the study will be observations of the feeding

behaviour of the Golden-shouldered Parrots at the start of the wet season. These will not be easy to obtain because the parrots are difficult to find when not breeding and it will be hard for us to follow them in wet conditions. The parrots on the Cape, like the Hooded Parrots, are probably relying on a few species. We suspect those species have disappeared in places where the parrots no longer occur. In the last wet season of the study we plan to look at the ecology of these food plants.

What we expect to find is that the food plants are affected by changes in fire regime and, possibly, cattle grazing. We think that there used to be more fires early in the dry season. These prevented widespread wildfires and left many patches unburnt for several years. When the first storms of the wet arrived, some of these unburnt areas would be burnt either deliberately to obtain green pick for grazing

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or as a result of lightning. Many longterm residents believe these storm burns are essential for keeping down the teatree suckers and seedlings that are spreading across the breeding habitat. Longer periods between fires at any one place would have resulted in greater fuel loads and hotter fires capable of cleaning up suckers. These fire regimes may also be important for maintaining the abundance of wet season foods.

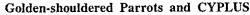
At this stage we are not sure what effect cattle have on the Goldenshouldered Parrot habitat but the parrots do seem to have continued to breed in places the cattle vacate in the wet season. At Artemis, for instance, the cattle head for the hills as soon as the first storms arrive, or move to the banks of the major rivers. In other areas the presence of fences, the steepness of the hills or the uniformly flat terrain prevents this. Cattle

also reduce the amount of grass that is available for storm-burning. Many people have observed to us that the suckers are thickest in bullock paddocks, where the grazing density is greatest. What may be necessary for both the sake of the parrots and to maintain good grazing country is to reduce the density of cattle > from an area once every few years in order to have an effective storm-burn. We are currently running experiments to test these theories and shall report on them in

later issues.

M'S ABOUT

TIME!



Over the last few years the Cape York Peninsula Land Use Strategy has been compiling an inventory of all physical and biological characteristics of the Cape to help future planning. Recently we have applied to have the Golden-shouldered Parrot project included under CYPLUS. This will enable us to draw on the work of CYPLUS scientists in interpreting our own results. We also hope to contribute to the project. Because most CYPLUS information has necessarily been collected during short expeditions by visiting experts, there has been little opportunity to study processes that are occurring in the environment. Our own studies of processes should complement the databases being assembled by existing CYPLUS projects.

### Golden-shouldered Parrots in captivity

Under new legislation the ban on keeping Golden-shouldered Parrots could have been lifted. Recently, however, the Queensland Council of Avicultural Societies agreed that the ban should stay until the end of the present study. We applaud this decision, and hope that, when this work is finished, it will be possible to lift the ban. By then DNA fingerprinting techniques should have been perfected, so all captive birds will be individually identifiable. Also active management will make it harder to take birds illegally from the wild. In the past we think over-zealous collecting has removed some populations so we are glad to see that most aviculturalists wish to make a positive contribution to the species' survival in the wild.

Though only two of us are involved in most of the fieldwork for this project, there are many others who are contributing their specialised expertise. With the help of the collaborators described on these two pages we hope to build up a comprehensive picture of all the aspects of Golden-shouldered Parrot biology that will be important for its conservation

### **Remote Sensing**

Simone Chick and Jim Monaghan Geography Department, James Cook University, Townsville

The pattern of fires and floods varies from year to year, and it is important to have a long term perspective to determine how this has influenced the Golden-shouldered Parrot's distribution. Simone, an honours student under Jim's supervision, is developing this perspective using remote sensing, including both aerial and satellite photography. Simone spent a fortnight at Artemis in March, wading about the swamps and beating off the March flies as we searched for nests and surveyed the vegetation. Her project should be finished in November so we hope to report the results in the next issue.

# Vegetation of Cape York Peninsula

John Clarkson and John Neldner Department of Environment and Heritage, Mareeba

We are lucky to be doing this project at a time when the vegetation of Cape York is being comprehensively mapped. From our work we can say what habitats the parrots are using and what foods they need, but mapping the extent of these would be a major undertaking beyond our resources. John and John are not only producing maps (providing us with advance copies) but have their information on computer which can be fed into other studies, including Simone's work on fire and flooding patterns.

## Extinction

Hugh Possingham
Department of Mathematics
Adelaide University
Hugh is a mathematician
who has developed a
computer program which
tries to predict whether
a species is likely to go
extinct. Called ALEX, it
uses information on
breeding success, life-

span and breaks in the species'

distribution, along with many other factors, to predict which stages of the life cycle are most likely to be affected by changes in the environment. If we can collect the right information, we should be able to determine if the Golden-shouldered Parrot is inevitably on the way out, or whether it could breed up again once the threats to its survival are removed.

# Tropical Bird Communities John Woinarski

Conservation Commission of the Northern Territory

John's studies of the ecology of birds in the Top End of the Northern Territory and in the Kimberley are the model for our own study of the community of birds that live on Cape York Peninsula. He has shown that tropical woodlands usually have about 10 birds per hectare. Using his methods we have found the Cape has about half that number of birds, with seed-eaters such as the Goldenshouldered Parrot being one of the main groups which are less common. This may be a result of differences in soil fertility, meaning less food. But we do know that several bird species have disappeared from sections of the Cape within the last 70 years,

suggesting that the dearth of birds could be from changes in the habitat.

# Incidental Bird Surveys

Visiting birdwatchers

Early in 1993 we put out an appeal to birdwatchers intending to visit Cape York Peninsula to come and help us find new populations. We also wanted them to count the numbers of finches and other seed eaters coming to drink at waterholes in the dry season to contribute to our understanding of woodland bird communities. Quite a number of birdwatchers have responded and we have been arranging for them to visit properties to survey birds. Many birdwatchers stop at Artemis to see the parrots and we are grateful that they are also finding the time to contribute to the species' conservation.

#### Finch Diets

David Mitchell and Richard Pearson Zoology Department of James Cook University

We are keen to discover whether the finches could compete with the Golden-shouldered Parrot, particularly during the early wet season when grass seed is scarce.

David will be working on finch diets at our

study IF ONLY EACH site on OF THOSE WORDS MEANT Artemis ANOTHER PARROT IN for his Master's THE BUSH! thesis, supervised by Richard. David was recently initiated into finch research when he assisted Sonia Tidemann of the Conservation Commission of the Northern Territory on her most recent field trip. He will start his work at Artemis in August by looking at dry season diet.



### Climate

Maria Cassinas and Matt Bolton Environmental Resource Information Network

Australian Nature Conservation Authority, Canberra

Golden-shouldered Parrots stop brooding their young when they are about 6 days old. So they can only breed where it is warm overnight through the breeding months of March to June. This is probably why they are only found on Cape York Peninsula, where the temperature almost never falls below 21°C. We think Hooded Parrots can nest earlier because the wet season starts about a month earlier in the Northern Territory. Even so colder nights mean they must brood their young. But we don't know how these and other aspects of climate limit the parrots' distributions. Maria and Matt have been using the vast databases held by ERIN to predict the probable distribution of the Golden-shouldered and Hooded Parrots based on the climate of the places where they are known to occur. The initial results suggest that the two species' climatic preferences are completely different.

#### Genetic studies

Les Christidis

Victorian Museum

Les was one of the first people in the world to extract genetic material from feathers and many of the historically important specimens of Goldenshouldered Parrots are held in the collections at the Victorian museum. His work will involve the genetics of the parrots at several levels. First he will be looking at the relationships between the three parrots that nest in antbeds, the Golden-shouldered, Hooded and the presumed extinct Paradise Parrot. He will also be looking at genetic differences between existing and extinct populations of Golden-shouldered Parrot, which will help us work out how much the parrots move between different areas. Finally, with the help of researchers at the Royal Children's Hospital in Melbourne and the Victorian Department of Agriculture,





Suitable (black) and marginal (shaded) distribution of the Golden-shouldered Parrot (left) and Hooded Parrots (right). These preliminary maps were prepared by Maria Cassinas of ERIN using BIOCLIM.

he will be attempting to develop techniques for taking DNA fingerprints of individual birds. This last project has had great support from the avicultural societies because the techniques should be applicable to all parrots and be a major tool in the control of smuggling.

#### Cat Diets

Daryn Storch

Department of Environment and Heritage, Cairns

One of the first things people ask us is whether cats are responsible for the Golden-shouldered Parrot's decline. To find a cat that has eaten a rare parrot would be an exceptional feat, but we can determine how much cats rely on birds for their food, and whether those birds behave in the same way as our parrots. Daryn is studying the diet of cats in central Cape York. So far we have ten guts awaiting analysis - most appear to be full of scales or fur rather than feathers. It is hoped to have many more now that we have a spotlight and a firearm. Anyone who would like to contribute cats to this study should contact Daryn on 070-523071 - any samples from the Cape are welcome.

# Food eaten by cats on Cape York Peninsula (analysis by Daryn Storch)

	%Volume	No. of
		cats
Vegetation	1.2	6
Insects	3.3	5
Amphibians	5.9	1
Reptiles	15.6	4
Birds	21.8	6
Mammals	51.9	6
Other	0.3	2

# Studies of captive birds

Kevin Langham

Tipperary Sanctuary for Endangered Wildlife, Northern Territory

While we were in the Northern Territory we visited Tipperary Sanctuary and saw the astonishing work being done there to conserve endangered wildlife. Kevin offered to run experiments using captive Golden-shouldered and Hooded Parrots that will supplement our studies of the wild birds. He has already provided material to Les Christidis at the Victorian Museum that will be used in genetic studies and is planning a series of experiments on feeding behaviour, rates of food intake and nutrition that will provide data that is unobtainable in the wild.

# Use of fire on Cape York Peninsula

Lesley Head

Geography Department, Wollongong University

Lesley has been studying the way people use fire in the Kimberley region of Western Australia. We are going to be working with Lesley, possibly with the help of one of Lesley's students, to do the same thing in areas where the Golden-shouldered Parrot occurs, or at least used to. We are sure changes in fire regime have had an effect on both the Goldenshouldered Parrot and other species on the peninsula. We hope to find out what those changes have been by talking to people who do the burning, finding out when they burn and why, as well as by doing experiments on the vegetation to see how it responds to fire at different times of year.

No study of wildlife these days seems to be complete without asking the animals to carry small radio-transmitters on their backs, to enable their movement to be monitored. This one is no exception and we hope to attach a dozen or more before the study is finished. Painted parrot-blue by their supplier, Ross Meggs of Faunatech in Victoria, they have already been shown to work in captivity with several small parrot species. Our first transmitter was a great success. We caught a female at her nest and, though she gave us a fright by disappearing at first, she soon returned and eventually fledged three young. While she was doing this we were able to trot about after her, tracking her to her roost tree and seeing where

Not that it all went easily. At first our H-shaped aerial detected strong signals from two opposite directions, and more than once we stalked

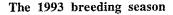
she ate.

carefully away from the parrots. There was also a problem with long grass. While the blips coming out of the head phones indicated the very thicket the bird was sheltering in, she remained invisible until suddenly she leapt into the air and flew away - half an hour's trudge away. Receivers and aerials are the most awkward of equipment to lug

through the bush, especially when also trying to carry binoculars, a tape recorder, a stopwatch, plant collecting equipment and a geographical positioning system device. The only compensation is that the antennae intercept spiders' webs before they hit your face.

The next two transmitters attached were less successful as we attempted to use them for following nestlings after they fledged. Alas the effort of carrying a transmitter proved too much for birds just learning to

fly. One fledgling
removed the transmitter
itself, the other we
removed for it, after
which it flew happily
after its father. In future
we shall confine the use
of transmitters to adults
towards the end of the dry
season. To be truthful we
would rather not use
transmitters at all, but
they will be crucial to
finding parrots in the
early wet season.



When we began this study we were under the impression that the parrots would not begin breeding until May with the last birds fledging at the end of July. The accepted wisdom was also that at least some pairs would have two broods, though the basis for this seemed to be something that Ma Gostellow told Donald Thomson in 1929. We were astonished to find that, for this year at least, some clutches had already been completed by mid-March, that the last young fledged in early June and not one of the pairs we located attempted a second clutch, even though some lost their first clutch in April. Though the wet season had a good start, essentially beginning with a cyclone, it ended early and abruptly. We think this probably determined the timing of the nesting season this year.

Of the 16 active nests we found, 15 reached the egg stage; one female was egg-bound and died in the nest. Six eggs were laid in 11 of the nests, five in three, and seven in one. Of the 15 clutches, 14 certainly produced young, with 74 chicks hatching from 88 eggs. At one stage we thought we were going to get so many fledglings that we hurriedly ordered more bands.

Sadly it was not to be. The first sign that something was going wrong was when we saw the carcass of a chick being carried away by meat ants. It wasn't the ants that were the responsible predators, however, but almost certainly a butcherbird; the ants merely cleaned up the pieces. And it seems the whole clutch was gradually robbed the same way. A nearby clutch disappeared completely in the same week. Two other clutches were also all but wiped out, we think, by Pied Butcherbirds - in one a chick just about ready to fledge was killed at the entrance, blocking the nest hole. Its skull was smashed, a characteristic of butcherbird attacks, and several butcherbirds were often seen nearby. Five other chicks which were stranded behind it in the nest starved to death. Naturally we were concerned that we had alerted the butcherbirds to the presence of the parrots but this seems

unlikely - in each case the birds appeared to have been killed a long time after we had been at the nest, we always made sure no butcherbirds were near the nest when we inspected it and we never stayed longer at a nest than was necessary, usually only a few minutes. Other young disappeared for reasons we were unable to explain - some probably died in the nest and were then consumed by maggots and moth caterpillars.

In the end we believe 33 young were raised to fledging by 32 parents. This means that the free-flying population in the region doubled in a single season, a breeding success that compares well with many other tropical birds that are far more abundant. So, despite the 63% mortality, we do not think the birds are having trouble breeding. Even if they produced more young it may just mean that more birds die later in the year. Therefore food, disease and nest predation in the breeding season are unlikely to be limiting the birds. But that does not rule out the possibility that the availability of nesting habitat and nesting sites might be limiting.