February 2020

Alice Springs Field Naturalists Club Newsletter

It is often difficult to tell the Collared Sparrowhawk and Brown Goshawk apart as they have almost identical colouring. In both species the female is larger than the male, which makes the female Sparrowhawk about the same size as the male Goshawk. The Sparrowhawk has more googly eyes while the Goshawk has a heavier, meaner brow. The tail shape is different too but not easy to tell when perched. This one, which I think is a female Sparrowhawk, was enjoying White-plumed Honeyeater lunch in our garden. Barb Gilfedder

Meetings are held on the second Wednesday of each month (except December & January) at 7:00 PM. Meetings are held at the Olive Pink Botanic Garden Visitors Centre.

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NEWSLETTER

The next newsletter will be March 2020

The deadline for the March newsletter will be 23rd February.

Please send your contributions to Barb Gilfedder: bjfedders@gmail.com

ALICE SPRINGS FIELD NATURALISTS CLUB

Wednesday 12 February

ASFNC Monthly get-together at 7.00pm at the Visitors Centre at Olive Pink Botanic Garden.

Speakers will be **Lisa and Pete Nunn** updating us on their fascinating **Letter-winged Kite** research project.

Followed by a light supper. All welcome.

Sunday 16 February

ASFNC Planning Meeting at 2.00pm at the Visitors Centre at Olive Pink Botanic Garden. All members are welcome to attend this meeting. Please bring ideas for talks and field trips. If unable to attend, please give your ideas to a Committee Member.

Wednesday 11 March

ASFNC Monthly get-together at 7.00pm at the Visitors Centre at Olive Pink Botanic Garden.

Speaker needed.

AUSTRALIAN PLANT SOCIETY ALICE SPRINGS apsalicesprings@yahoo.com.au

Wednesday 5 February

APS AS Monthly Meeting at Olive Pink Botanic Garden at 7.30pm.

Speaker: **Gill O'Connor** will be showing highlights from a very flora-rich trip through Western Australia.

Followed by a light supper. All welcome.

Alice Springs Field Naturalists Club Committee Members

President	Barbara Gilfedder	8955 5452
Vice-President	Lee Ryall	0417 401 237
Secretary	Kimberley Morgan	0402 527 195
Treasurer	Neil Woolcock	8955 1021
Property Officer	Rosalie Breen	8952 3409
Public Officer	Anne Pye	0438 388 012

Committee Members:

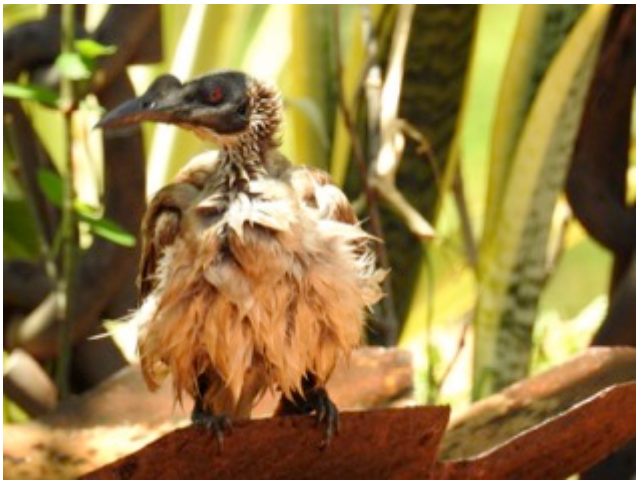
Anne Pye	0438 388 012
Margaret Friedel	0417 849 743

Other Club Responsibilities:

Newsletter – Barb Gilfedder bjfedders@gmail.com

Facebook Organiser – Position vacant.

Website - Robyn Grey-Gardner 8952 2207



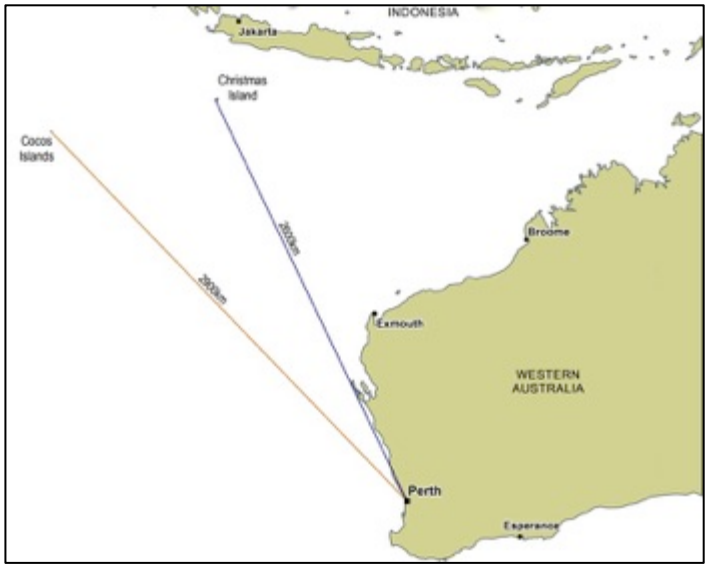
Above: This rather scuffy Silver-crowned Friarbird had just cooled off in Jenny Purdie's birdbath in Katherine.
Below: Jane Bannister photographed this beautiful Sand goanna on her verandah. He was very big. The pot he is lying on is 25cm across. She knows they are omnivorous, but can't imagine how he is getting enough to eat when it's so dry.

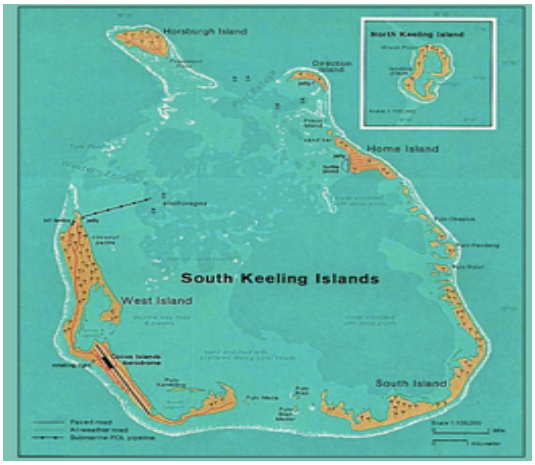
Speaker Report – November 2019 by Rosalie Schultz

Margaret Friedel - A Visit to Cocos (Keeling) Islands and Christmas Island in March 2019

Marg talked about her fascinating visit with family to the Cocos (Keeling) Islands, and Christmas Island. Here I've chosen some memorable points described through Marg's ecologist eye.

Cocos (Keeling) Islands are an archipelago about 2900km northwest of Perth, governed as an Australian External Territory. Virgin Airlines flies there from Perth twice weekly.
These islands are coral atolls, which are ring-shaped reefs of coral that have developed around old volcanic seamounts. They arise from seas as deep as 5000m, and the fringing reefs grow well with water temperature above 19 degrees. The mountains on which the corals have grown have sunk into the sea while the reefs have continued to grow upwards to the sea surface.





Left - Map showing Cocos (Keeling) Islands 2900km NW of Perth, and Christmas Island NE of them, 2600 from Perth.
Above - Cocos (Keeling) Island map from Monash University
http://users.monash.edu/~ckopp/cocos-islands.html

Settlement History: There are no indigenous peoples of the Cocos (Keeling Islands), which were first discovered in 1605 by Captain William Keeling, of the East India Company. They were named Cocos by the Dutch in 1659 because of the abundant coconut palms. First settlement was on Home Island in 1826 by merchant Alexander Hare and people of English, Malay, Chinese, Papuan, Indian and African origin. The Clunies-Ross family arrived in 1827 and eventually fell out with Hare, who left. The Clunies-Ross dynasty developed the Islands' economy through exporting coconuts, coconut oil and copra. The Islands were annexed by the British Empire in 1857, then granted to the Clunies-Ross family in perpetuity in 1886. Subsequently the Islands were transferred to Australia in 1955 and purchased from the Clunies-Ross family in 1978. In 1984 residents voted for political, social and economic integration with Australia.

A few plants noted in the presentation:

Left - Coconuts trees are native and thrive on brackish water. Coconuts can float between islands, and dominate the southern atoll after large scale clearing of native forest. Coconut products have been an important industry for Cocos (Keeling) Islands.
Centre - Scaevola taccada grows well in poor soils and areas previously cleared for old plantations.
Right - Pemphis acidula scrub in the Lythraceae family, related to the Pomegranate.

COCOS (Keeling) Island Crabs: Crabs are prolific on the Islands with tracks everywhere.

Left - Hermit crabs *(Coenobita sp), some the size of tennis balls, are very common, climbing on and scavenging anything not moving. Right -* ***Ghost crabs*** *are beautiful creatures but harder to spot. They can eat small hermit crabs.*

Purple Land crabs *Cardisoma carniflex are abundant, particularly on the edges of the lagoon. This one is fiercely guarding his coconut meal. They are great soil engineers, tunnelling into the sand.*

Christmas Island is 1000km from Cocos (Keeling) Islands, only 430km from Indonesia, and is the peak of a volcanic seamount, which rose steeply about 60 million years ago. A series of geological uplifts over 10 million years created layers of limestone over the basalt core. The ocean-eroded cliffs at each uplift forming stepped terraces and inland cliffs. There is virtually no coastal shelf and the sea plummets to 500m within 200m of the shore. Two thirds or 85km^2 of the Island is National Park under Parks Australia.

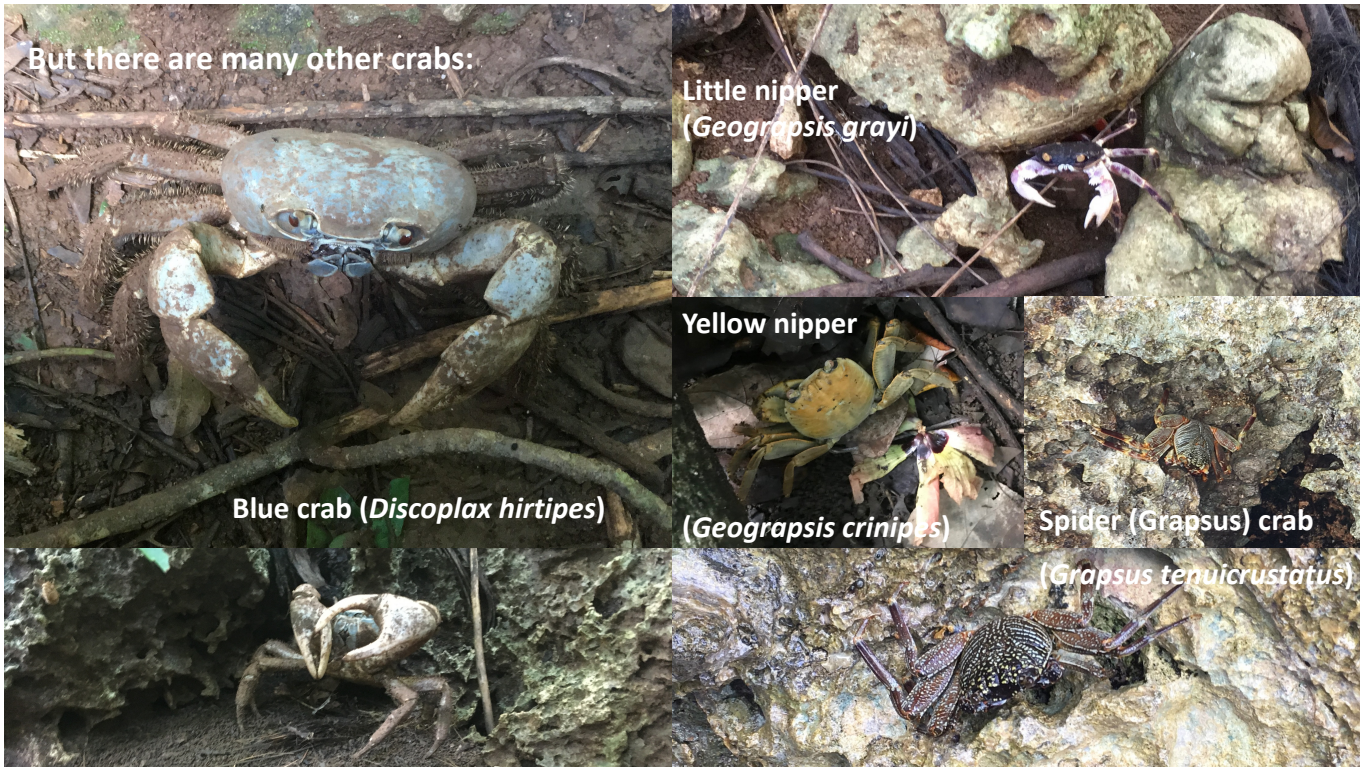
Settlement History:

Christmas Island was discovered on Christmas Day in 1643, with the first landing in 1688. Large scale phosphate deposits as guano were predicted in the 1870s and mined from 1899 by indentured labourers, initially Malay people from Cocos (Keeling) Islands, but predominantly Chinese who were forced to move 4-7 tonnes per day. Administration of Christmas Island was transferred from London to Singapore in the early 1900s, then to Australia in 1958 with payment of £2.9m to compensate for loss of phosphate earnings.

Christmas Island Crabs:

Christmas Island is famous for its crabs, particularly the red crabs with their annual migration in huge numbers. Crabs are everywhere, eating almost anything, clearing forest floor of both living and dead material. Crabs originally colonised the islands from the sea, once there was sufficient stuff to scavenge. The red crabs probably didn't arrive fully formed but evolved from early colonisers.

Left - The famous Christmas Island red crab Gecarcoidea natalis*. Right -The forest floor covered in red crabs. Every year, millions of these crabs emerge from the forest and make their way to the ocean to breed, swarming across roads, streams, rocks and beaches.*

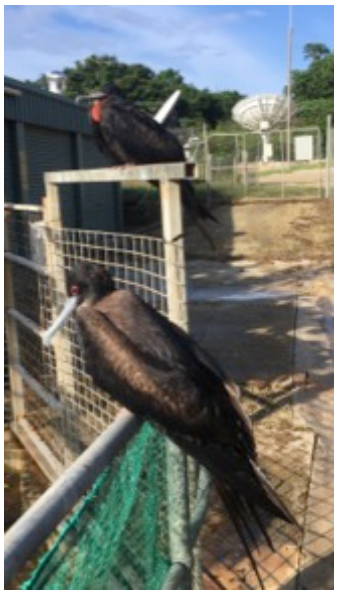


*The **Robber crab** is the largest land crab in the world, and can be a traffic hazard. Their huge claws can dehusk and open a coconut, or demolish a red crab.*

Frigatebirds

Greater Frigatebirds and the more geographically restricted Christmas Island Frigatebirds swoop, dive and scavenge like black kites.

Left – hassling a fisherman. Centre – a pair waiting for a feed. Right - diving for a drink.



Challenges

Sea level rise and climate change are important concerns on Cocos (Keeling) Islands, which are low-lying coral atolls 3 to 5m above sea level. With rising sea levels and increasing frequency and intensity of storms, inundation is a risk to both people and ecosystems.

Christmas Island's economy was established on the mining of phosphate. An asylum seeker detention centre was established by the Federal Government in 2005, closed in 2018 and reopened 2019. Many of the residents consider that these enterprises provide a solid and sufficient base for the economy of the island, although mining now depends on processing second and third grade spoil dumps. Since a lot of the dumps are within the National Park, there are tensions amongst community members and with the Government. Horticulture and tourism are both potential alternative industries but they are yet to find much support in the community.

Finally, plastic and other rubbish defiles all the islands. The southern equatorial current picks up ocean rubbish and dumps it on beaches, damaging and risking many creatures and ecosystems.

Thanks to Marg for sharing her naturalist stories of Cocos (Keeling) Islands and Christmas Islands with us.

War, Peace and Protection: what does go on in Schwarz Crescent?

On Thursday October 24th 2019 Jonathan Beedham from US Airforce Detachment 421, gave a dozen or so members of the Alice Springs Field Naturalists Club a guided tour of the Joint Australian U.S. Geological & Geophysical Research Station (JGGRS) in Schwarz Crescent, Alice Springs.

The Schwarz Crescent facility was established in 1955 to monitor nuclear explosions during the cold war, though this function was not then openly admitted. Authorities called the facility a weather research station and classified its activities as state secrets. The facility's operations were declassified in 1978 when the JGGRS treaty was signed enabling staff to talk openly about their work for the first time.

From 1955 to 1966 the Americans who operated the facility worked in partnership with the RAAF. From 1966 onwards the Americans partnered with the Australian Geological Survey Organisation (AGSO), now Geoscience Australia in Canberra, which collects all JGGRS data.

The numbers of Americans employed at the facility has declined since it was first opened due to improvements in technology, which have reduced the need for human labour. In the early years authorities monitored nuclear test activity from the air. Now it uses "a global network (see map) of seismic, infrasound, and hydroacoustic monitoring stations" like the one in Schwarz Crescent.

The Schwarz Crescent facility consists of 24 monitoring stations, which are located in the bush, 10-20 kms east of Alice Springs. A cable plant goes out to all 24 sites individually requiring JGGRS staff to maintain 200km of buried cable, 600 cable markers and 70 km of access roads. Though the cable was laid by Telstra 37 years ago, it still works well. The facility now has solar power. Each site also has its own seismometer. The facility also has its own satellite dishes, which transmit data to the International Monitoring System in Geneva, Switzerland. They currently have an old satellite dish available to give away to a good home should anyone want one.

The location of the monitoring stations, on land JGGRS does not own, has resulted in JGGRS forming a close working relationship with Parks and Wildlife, Bond Springs and Undoolya Cattle Stations. The bush location of the monitors, along with the regular staff changeover and an attendant loss of institutional knowledge is sometimes a challenge causing staff to become unfamiliar with the exact location of some monitoring stations and being unaware of the status of others. If you see anything odd in the bush, which you think may be associated with the facility, or come across damaged equipment, please don't hesitate to let Jonathan and his staff know.



Photos show Jonathan Beedham talking to Field Naturalists about the work he and his colleagues do; data collection equipment; graphs of natural and man-made seismic events compared.

Married USAF Detachment 421 personnel are posted to Alice Springs for three years, with an option to stay a further year if they want. Personnel without family are posted here for 2 years with the option to stay an extra year if they wish. Asked if they liked living in Alice Springs, the general consensus appeared to be that they found it disturbingly remote. It was one thing to live in a small town in America where the nearest other small town was a few hours away. It was entirely another to live in a place with a fifteen hour drive to the nearest city. Jonathan and his associates also get slightly irritated with the assumption that just because they have American accents they work at Pine Gap. The work of Pine Gap and the work of the Schwarz Crescent facility, as well as their institutional affiliations within the American military are entirely different.

JGGRS Seismic Array system records the low frequency waves, which are generated by nuclear explosions and other movements in the earth's crust. The waves are recorded in analogue, digitised, authenticated and then sent elsewhere for analysis. In the old days this work was done on paper spools, which had to be collected and deposited in the bush by hand. These days the data is transferred between the individual monitoring stations, and the Schwarz crescent facility electronically, from whence it is transferred to Geoscience Australia and the Comprehensive Test Ban Treaty Organisation.

One of the primary tasks of data analysis is to distinguish between man-made and naturally occurring seismic activity. Generally speaking, the deeper an event the more likely it is to be natural. Man's capacity to dig into the earth's crust is limited. As the photos Barb Gilfedder took of two illustrative wave graphs show, manmade events also produce much neater wave graphs than naturally occurring ones. The man-made event used to illustrate this general truth, North Korea's explosion of a nuclear bomb on the North Korean peninsular in 2017, had a particular significance for me. I was sleeping in Seoul the night the North Korean's, in a related but separate event, sent an unarmed intercontinental ballistic missile into the Sea of Japan, an event which seemed to disturb me far more than it disturbed any of the South Koreans with whom I interacted. This unexpected connection between my life and JGGRS does make me really appreciate the importance of JGGRS work.

The importance of knowing when a seismic event is man-made or natural is one of the reasons why Alice Springs was chosen as a site for this technology. The Earth, Jonathon pointed out, is an extremely noisy place, both on the surface and underneath. Central Australia in general, and Alice Springs in particular are comparatively quiet. The region is sparsely populated and geographically stable. Bedrock, which amplifies seismic movement, is relatively close to the surface in Alice Springs, making it easier to detect seismic waves.

The importance of quiet became apparent when Jonathon told us that from time to time, JGGRS measurements are disturbed by the noise of the rock crusher at the local Quarry. This prompted one of our members to ask what impact 'fracking' might have on JGGRS activities. Depending on where the 'fracking' takes place, it could have a very negative impact on JGGRS data collection activities. Geoscience Australia is monitoring the situation.

It's not just the tectonic movements of the earth's plates, which create the kinds of noise which disturb JGGRS capacity to detect seismic waves. It's also things from outer space. Thus for example in May 2019 a meteorite passed close enough to Alice Springs to make a loud bang, recording its presence on JGGRS graphs. The bang was loud enough to have woken some people from their sleep. I am guessing that I was one of those people. Sadly, until we visited JGGRS I thought the bang had something to do with theft.

Data from JGGRS and the other seismic array systems around the globe is sent to the Comprehensive Test Ban Treaty Organisation in Geneva, which is tasked with monitoring adherence to, and breaches of, the Nuclear Test Ban Treaty. JGGRS individual contribution to this global enterprise was particularly important when the French were conducting Nuclear Tests in the Pacific between 1966 and 1996. Currently JGGRS is playing a pivotal role in monitoring all nuclear activity including North Korean atomic activity. The cleanliness of Australian data also means that Australia makes a greater contribution to these global monitoring systems than any other country.

Jonathon observed that the need to monitor nuclear explosions has played a pivotal role in increasing scientific understanding of the earth's plates and the contribution plate movement plays in the creation of tsunamis and other naturally occurring, life endangering events. Though originally founded to detect atomic activity, JGGRS is now sending data to an International Tsunami Warning Agency. Together with the other arrays, JGGRS provides 24/7 worldwide coverage of the Earth's seismic activities, natural and man-made.

When asked whether he thought the Schwarz crescent site was a military threat, Jonathan was adamant that it was not. Being open about the work the facility is doing, evidences the absence of military threat as well as helping reduce it. In addition to offering tours of the Schwarz Crescent facility to community groups like the Field Naturalists Club, staff at the Schwarz Crescent facility also conduct science workshops for local school students.

That the secrecy which once surrounded JGGRS activities contributed to the perception that the Schwarz Crescent facility was both a threat and threatening is nowhere more evident, I think, than in the a newspaper article which I found on Trove after our visit (*just couldn't help myself)*.

Thanks go to Ian and Wendy Mann for organising the visit and to Jonathan Beedham and his colleagues from USAF Detachment 421 for showing us around the Schwarz Crescent Facility and for doing all they can to create a safer world.

More information about JGGRS work can be found at: https://www.ga.gov.au/

Megg Kelham, November 2019.

Some of our early morning walkers have been checking out seismic collectors in the Telegraph Station area. See March Newsletter. Also newspaper article Megg mentions.(Ed)

Talk about Alcoota fossil location

Adam Yates, 24/9/19, and later conversations with Adam
by Meg Mooney

Alcoota has the oldest mammalian megafauna in Australia. A trend for large-sized mammals, collectively called megafauna, developed around the world during the late Miocene, a time of global drying and cooling, as ice accumulated at the poles, sea levels fell, rainfall decreased and rainforests retreated.

The development of megafauna was associated with the spread of more open habitats, grasslands in the northern hemisphere and shrublands in Australia. With less nutrient-rich foods, compared to forest, large animals have the advantage of taking in a greater quantity of food and having a slower metabolism. The Australian megafauna were browsing marsupials and became extinct 20,000 to 40,000 years ago, possibly associated with the arrival of humans.

Alcoota is the only site in Australia containing a rich variety of terrestrial animals from the late Miocene, 6 to 10.4 million years ago. The main fossil layer, in the Waite Basin, also has Australia's largest concentration of vertebrate fossils in a single horizon, a maze of bones often tightly packed together. How this came about is still not completely clear, but some theories have been developed (see below).

The area with fossils is around the size of two soccer fields. The main fossil-containing layer is eroded away to the west, disappears under a rise to the east and peters out to the north and south. Fossils have also been found in a higher layer, at 'Cowpat Hill', a small mesa to the south of the main pits.

Adam Yates (centre) on site, at the Alcoota fossil dig.

The Alcoota fossils have been dated using fossils of *Zygomaturus*, hippo-sized diprotodons, from Cowpat Hill. These fossils are the same species as some found at Beaumaris in in Victoria, associated with volcanic rocks which have been dated to 6 million years ago. Dating is less accurate for the main pits at Alcoota but changes in some of the fauna between there and Cowpat Hill mean they are thought to be around 8 million years old.

Most of the animals found are unique to Alcoota. There are up to 3,000 individuals from at least 33 different species, with the majority being animals from around 7 species.

The common animals include the flightless bird, *Dromornis stirtoni,* thought to be a kind of goose up to 3 metres tall and one of the largest birds that ever lived. Two *Ilbandornis* species, also flightless birds, and a cow-sized *Plaisiodon,* sheep-sized *Kolopsis* and wallaby, *Dorcopsoides,* species are also common. There are also lots of fossils, often teeth and scales, of a few individuals of huge stocky *Baru* crocodiles.

There are less carnivores at Alcoota because there are always less of these than other animals in a group. As well as crocodiles, the Alcoota carnivores include a leopard-sized marsupial lion, a wolf-sized thylacine, a smaller thylacine, and a very large goanna.

Rarer fossils include a large tapir-like marsupial, small flying birds, a short-faced kangaroo, a wombat and a dwarf crocodile.

The Museum of Central Australia has been running digs at Alcoota since the 1980s and has collected around 10,000 specimens. The site was first investigated by palaeontologist in the 1960s, after an Aborigina stockman found bones on the surface in the late 1950s.

The Museum continues to hold digs at the site to look for rare species, build statistically useful sample sizes for palaeobiological studies and gather more information about the late Miocene, including how and why so many animals died at one site. The excavations also give schools and community volunteers the chance to experience a dig and provide valuable experience for university students.

So how did all these animals come to die in one small area? One theory is that during a prolonged drought a river contracted to waterholes that the animals became tethered too, eating out the nearby areas.

However, animals in severe drought conditions wouldn't be breeding and there is ample evidence at Alcoota that the animals were breeding. There are jaws of juvenile animals, with unerupted or partly erupted teeth. Birds sequester calcium in their bones when they're going to breed, building a special bony tissue called medullary bone. Half of the *Dromornis* found at Alcoota are females and all have medullary bone.

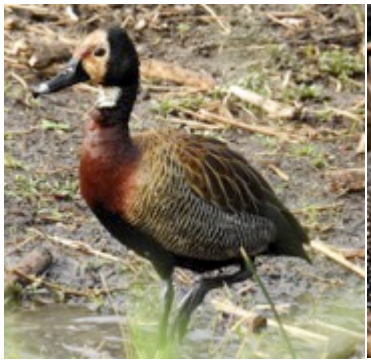
Adam has suggested that as the water dried up it may have become poisoned by a toxic algal bloom and that is why so many animals died. This may have happened repeatedly over a few years, less than a decade. The fossilised bones were in good condition before they were broken up during burial in mudflows, which means they weren't on the surface for long. There may have been a series of these events over a few hundred years and the bones were all jumbled together during burial.

Jenny and Steve sent in a wonderful collection of bird photos they took in Africa. There are several pages of them. I will fit them into the newsletter as we have room. Here is part one. (Ed.)

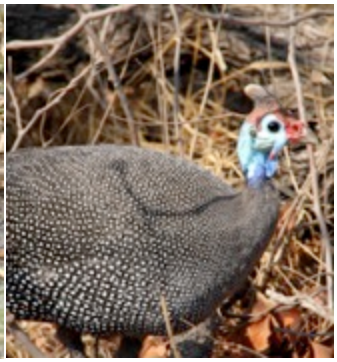
SOME AFRICAN BIRDS Jenny Purdie and Steve Sinclair

We spent 7 weeks in Africa – Zambia, Namibia and South Africa –in August/September 2019. Most of the time we were in National Parks where we got to see a good number of birds. As you are not permitted to get out of your vehicle, except in a few designated places, most of the birds were photographed out the vehicle windows. However having said that, many of the birds are unfazed by vehicles so tend to hang around. There are also some good hides where you can sit and watch the birds and animals and some are available to stay overnight in. The following are some of the birds we managed to photograph (and ID).

Egyptian Geese



White-faced Whistling Duck

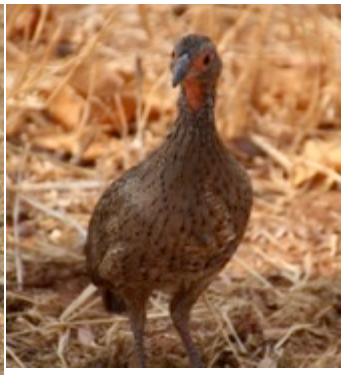


Helmeted Guinea Fowl

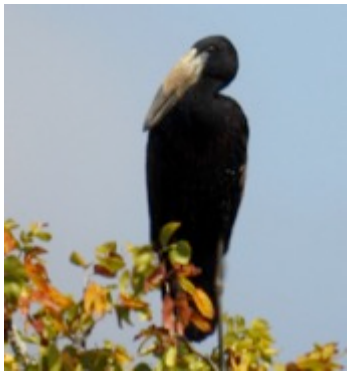
Cape Francolin

Crested Francolin

Natal Spurfowl

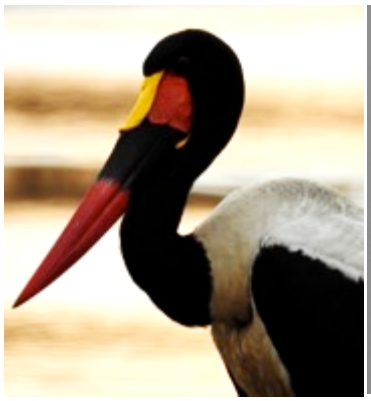


Swainson' Spurfowl

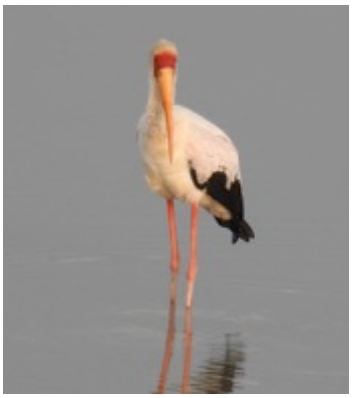


African Openbilled Stork

Marabou Stork

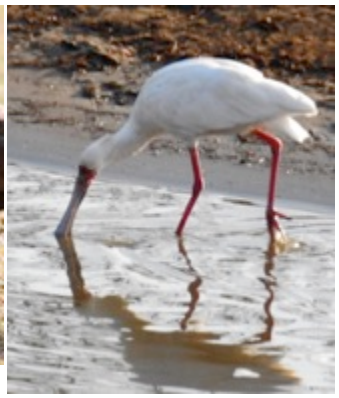


Saddle-billed Stork



Yellow-billed Stork

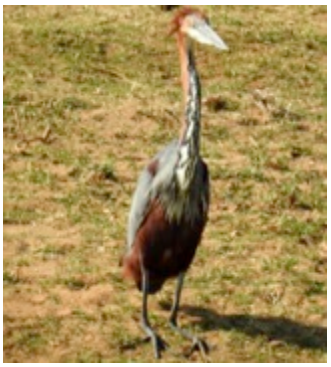
Hadada Ibis



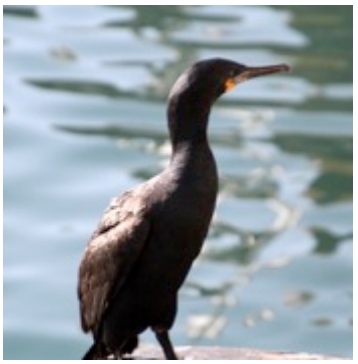
African Spoonbill

Goliath Heron

Green-backed Heron



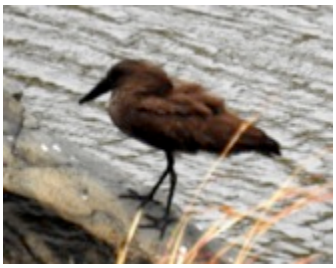
Puple Heron



Cape Cormorant

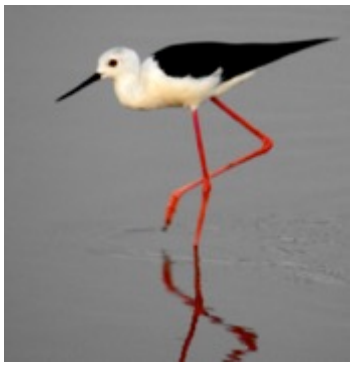
Squacco Heron

Great Egret



Hamerkop

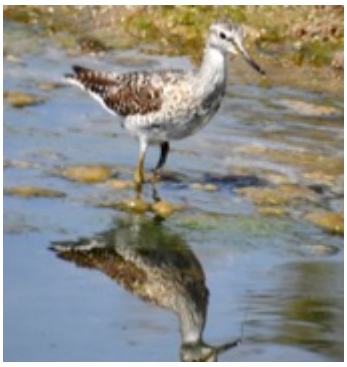
Black Crake



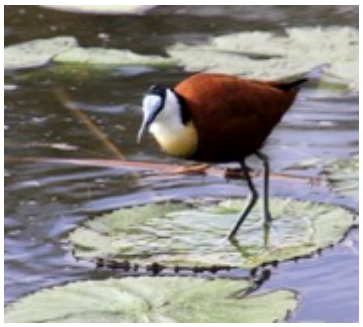
Black-winged Stilt

Greater Flamingo

Lesser Flamingo



Common Greenshank



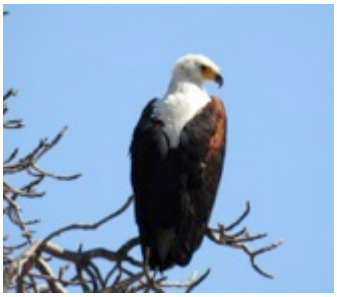
African Jacana

Water Thick-knee

Crowned Crane

Hooded Vulture

White-backed Vulture



African Fish Eagle

Bateleur Eagle

Tawny Eagle

ALICE SPRINGS FIELD NATURALISTS CLUB INCORPORATED
Minutes of the general meeting held in the Visitor Centre
Olive Pink Botanic Garden – Wednesday 13 November 2019

Open: Barb Gilfedder declared the meeting open at 8:30 pm following a presentation by Marg Friedel on Cocos (Keeling) & Christmas Islands. Thank you to Connie for providing supper and to Rosalie Schultz for note taking!
Present: 20 members, 9 visitors, and 9 apologies as per attendance book.

Minutes: The Minutes of the October 2019 general meeting as printed in the newsletter were accepted by the meeting.

Treasurer's Report:

Balance of all funds (including petty cash) end of Sep 2019	$2,389.77
Income for Oct 2019	
• Membership	45.00
• Interest	.19
Expenses for Oct 2019	
• Nil	
(***Petty Cash*** *- $39.85*)	
Total of all funds including petty cash end Oct 2019	**$2,434.96**

The meeting accepted the Treasurer's report.

Correspondence:
- AUHost invoice for web site. Last year's payment of $99 was for 3 years. Barb has sent an email querying the current invoice.
- Various emails addressed to ASFNC have been forwarded to membership.

General Business
- OPBG is embarking on a recycling project to help with funding. Should ASFNC members wish to help with this project please bring containers on a meeting night or any other time during weekday hours. Only 10 cent refundable containers please.
- Books belonging to ASFNC will be added to the Frances Smith Library (OPBG). Peter Jobson has removed excess copies. At a recent Australian Plants Society Alice Springs (APSAS) meeting it was agreed that the library be a reference library. As a general rule books cannot be removed from the premises although there may be exceptions. There is an index to the library but not complete at present. When up to date copies can be distributed. It was also recommended that a copy be sent to other libraries in town.
- Starting time for future meetings. Members voted to keep start time at 7pm.

Past Events:
- Friday 11 October 2019 – Tour of Community Garden 5pm organised by Wendy and Ian Mann.
- Saturday 19 October walk from Old Ghan along western ridge organized by Connie.
- Thursday 24 October talk at the Joint Geological and Geophysical Research Station (JGGRS) on Schwarz Crescent organised by Ian Mann.

Future Events:
- Friday 15 November 2019 – Camp at Serpentine Chalet Bush Camp and morning walk to the dam. Organiser - Connie.
- 30 November 2019 – End of Year Breakfast at Telegraph Station. Bring a plate to share plus BYO drinks chairs etc. Gate opens 8.30am. Jill Brew suggested a walk before breakfast – details to be advised.

Next Meeting:
- Wednesday 12 February 2020. Lisa and Peter Nunn will give an update on *Letter-winged Kite project.*
  Scribe – Pam Keil. Supper – Jill Brew

Sightings:
- Pam Keil – at a recent twitch-a-thon 98 species were recorded. 107 is the record for the area they were recording, so not bad for a drought year. She also mentioned seeing 10 Silver Gulls at the sewerage ponds and a host of other species at various locations around Alice Springs.
- Johannes reported 70-100 Red-tailed Black Cockatoos on several occasions in Mt. Ebenezer area on the Lasseter Hwy.

Meeting closed – 9 pm. Minutes compiled by Connie Spencer