The Red Goshawk

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Late on Sunday afternoon 15 August 1965 I was relaxing at a waterhole several kilometres to the east of Timber Creek Police Station, Northern Territory. It was a pleasant balmy day. Three species in particular were claiming my attention — a busy family of Purple-crowned Fairy-wrens *Malurus coronatus*, a male Shining Flycatcher *Myiagra alecto* and, as it was then known, a Buff-sided Robin *Poecilodryas cerviniventris*.

Suddenly the alarm call of a honeyeater was heard. The wrens disappeared into long grass under a palm tree. The flycatcher made for some neighbouring dense undergrowth. The robin, with amazing but commendable speed for the species and indeed at its peril, crossed the open waterhole before plummeting into a low shrub as deathly silence prevailed. This however was short-lived, being broken by a swish of wings as a large reddish-brown goshawk swept by close behind me in pursuit of prey.

My presence must have surprised the bird, for it abandoned the chase, veered sharply to the right, crossed the waterhole and came to rest in a tall tree facing the direction in which it had been travelling. The richness of the dark brown back and wings, the powerful legs and the sheer bulk of the bird confirmed my first impression that our unexpected guest was a Red Goshawk.

I was most anxious to get a better view and, in particular, to check the heavy bars under the tail and wings that appeared to be diagnostic characteristics in specimens I had previously examined in the H. L. White Collection in the National Museum of Victoria.

The bird proved to be a very wary individual and I failed to make other worthwhile observations. The tree into which the bird had flown contained a large nest which could have belonged to the goshawk, but although I kept it under observation for the remainder of my stay at Timber Creek, the goshawk did not return and there was no evidence to suggest that the nest was being used.

It was not until 15 October 1974 that I again encountered Red Goshawks in the field. I had located a single bird of prey, almost fully fledged, sitting on the edge of a nest some seventeen metres aloft in a tall Bloodwood. I was endeavouring to identify the fledgling when the parent arrived. The adult was undoubtedly a Red Goshawk. On discovering my presence she became very agitated and excitedly flew around the tree, uttering a series of shrill shrieks and very loud cries. The young bird, which appeared to be almost ready to fly, became restless and left the nest to perch near the extremity of the limb supporting it.

The female's performance must have attracted the attention of her mate, for he arrived in silence, perched in the topmost branches for a few moments, then joined her in a series of frenzied dives and swoops.

Although he added to the commotion, his vocal contribution did not match that of the female, neither in volume nor intensity. In the course

of the acrobatic display, both presented excellent opportunities for observing the shape of their wings, body and tail. The pattern and distribution of the markings were seen to advantage from below.

On several occasions they approached so closely at the end of their dive, that as they stalled momentarily before making another steep ascent in order to repeat their breath-taking plunge, the tail was fanned to its fullest extent, so that with the naked eye the rufous thighs and bright yellow legs were plainly visible. With the aid of binoculars other details were noted, such as the greyish bill tipped black, thus matching the black talons which contrasted sharply with their yellow legs. The eyes also appeared to be black. Yet what held me spellbound was the fascinating pattern of the barred under-wings and tail, so symmetrically perfect and so prominently etched against the clear sky that it has been permanently and indelibly stamped upon my recollection of that momentous occasion. It is still one of the most memorable experiences of my ornithological career.

The horizontal bands across the tail and wings of each bird were well marked, clear cut, definite and quite unlike any other bird of prey it has been my good fortune to study. The silhouette of the Red Goshawk in flight on Plate 24 of Slater (1970) does not do justice to the adult bird in the field. In my opinion the bars and bands are as diagnostic in the adult Red Goshawk as the windows are with the Black-breasted Buzzard.

On the other hand the Red Goshawk, as I had discovered at Timber Creek, is not always as obliging as this pair, nor does it indulge in the frequent spectacular gliding performances of the Buzzard which renders identification so much easier. It follows therefore that the barring under the wings and the banding of the tail, though diagnostic, may not always be readily observed and one is then obliged to rely more upon the strikingly rich reddish-brown colour, the size, comparable in the field to that of the Little Eagle, and, if fortunate enough to see them clearly, the legs, as the dominant points of identification.

But to return to our family group. After some time the excitement of the parents abated, the young bird became less agitated and both adults alighted in the nesting tree as it shuffled back to the comforting protection of the nest. It settled down and gradually disappeared from view.

As we did not wish to draw the attention of passing traffic to our own activities and so perhaps endanger such a rare and beautiful species, we regretfully resumed our journey without climbing the tree or causing further distress to the goshawks.

As I knew that my friend Jack Cupper and his son Lindsay were most anxious to photograph the Red Goshawk and, as I had already predicted it would prove to be their most challenging, difficult and expensive assignment, I informed Jack of my good fortune in locating the nest soon after returning to Mildura. By that time the fledgling would have left the nest and it was apparent that nothing further could be done that season.

During the ensuing years my friends the Cuppers spent considerable time, energy and money in a fruitless endeavour to locate a nesting pair of Red Goshawks in a more convenient venue; even their offer of considerable financial reward or compensation failed to produce any worthwhile information.

So, in desperation, Jack wrote to me on 29 July 1980 (I was recuperating from a serious illness at the time) to ascertain if I would be willing to pinpoint the location of the 1974 nesting site. I agreed to do so at once and gave him sufficient information not only to find the locality, but also to enable him to fix the exact date when the fresh egg or eggs could be expected, and also described the type of tree and the situation in which the nest would most likely be found.

Jack and Lindsay Cupper made immediate arrangements to leave for Cape York again and it is to their credit that they eventually located a new nest in the vicinity of the old one with the female brooding a single egg.

Their detailed observations of the nesting and the economy of the Red Goshawk together with the publication of their photographs is a triumph which they will undoubtedly record in due course. They are to be congratulated.

There can be no doubt that at least one, if not both of the birds they photographed, were identical with those I observed in 1974. That being so, it reveals the strong attachment Red Goshawks have to their chosen territory and, like the Brown Goshawk, they may breed in the same district for years.

A review of the early accounts by Campbell (1900, pp. 10-11) and North (1912, p. 199) is most enlightening in this respect.

The first recorded nest was found by the Barnards on their Coomooloo-baroo Station in September 1884 notwithstanding the shooting of a male there the previous year (Barnard 1934, p. 27):

> The nest was a bulky structure, composed of dead sticks and green branches, lined thickly with green leaves and was much larger than the usual run of hawks' nests. Several nests of this fine hawk were found in later years, all built in range country and placed high up in lemon-scented eucalypts. Only two eggs are laid at a sitting. On one occasion a flock of Maned Geese (Chenonetta jubata) was disturbed from the edge of a swamp, and as they flew off a Red Goshawk came like a stone from the sky, and, dashing into the flock of birds, struck one of them dead to the ground, then circled in the air, waiting till the coast was clear before commencing a meal.

It would be interesting to know whether the goshawk partook of its meal on the ground, as many falcons do, or whether it took it to a neighbouring tree to commence plucking its prey in the usual goshawk fashion.

On 29 October 1889 some five years or so later a second nest was located on their station property. The circumstances surrounding the second nest are rather intriguing. As in the first instance this nest contained two eggs which were collected and the male subsequently taken as a specimen.

About a month later when the nest was climbed again it contained a third egg notwithstanding the shooting of the male at the time of collecting the eggs (Campbell 1900, pp. 10-11).

Unfortunately we are not supplied with sufficient data to enable us to determine whether the female actually completed a clutch of three and deserted the third egg or whether she acquired another mate and produced a repeat clutch of one egg only about a month later. I shall refer to this set anon as the problematical clutch of three.

It is, however, worthy of note that a third nest was found by the Barnards four years later on 2 March 1893 when both adults and a clutch

of two eggs were secured. Surely a sinful waste to persecute such rare birds so relentlessly. These eggs I have been unable to trace.

Mr Barnard found a fourth nest containing two recently-hatched young on 3 October 1893. It is presumed that the chicks were successfully reared, however by 1907 Mr Barnard advised North (1912, p. 199) that he had not seen the Red Goshawks for years and that they had entirely left the district.

In 1913 and 1914 H. G. Barnard renewed his acquaintance with the Red Goshawk in the McArthur River country where he had ample time to study the bird more closely. His report in *The Emu* (Barnard 1914, p. 41) reads as follows:

> Only a few of these fine birds were seen. A nest found early in September [1913 Ed.] contained one hard-set egg. A second nest, with two fresh eggs, was found a few days later, and under this nest lay the remains of a Nankeen Night-Heron. On visiting the nest exactly four weeks later, two fine eggs, evidently laid by the same pair of birds, were taken. While I was taking the eggs the male bird brought a Naked-eyed Partridge-Pigeon (*Geophaps smithi*) with which to feed his mate.

Barnard (1934, pp. 27-8) also located a half-built nest and watched its completion during the ensuing three weeks:

> The female appeared to do most if not all of the nest building. One time it would be a green branch and another a dead stick. Twice the male brought a dead bird in his claws and fed it to his mate when she was at the nest, but I did not at any time observe the male with a stick.

In the meantime however an important contribution had been made by G. F. Hill (1911, p. 266) who spent ten months in the Kimberleys in the interests of H. L. White and in his report he wrote:

> I saw four only of these new and fine Goshawks. On 1/5/10 a pair took possession of the nest referred to under *Hieracidea orientalis*, to which they added a few sticks and a lining of green cajaput leaves. They were not seen again until the middle of June and then only occasionally flying at a great height. On 30th June a bird was noticed on the nest for the first time and on the following day a single egg was secured, the shell of which was already chipped, but I managed to save it. As the nest had been examined at a distance almost daily since the beginning of May and the sitting bird was not noticed until the end of June, I feel sure that the process of incubation was carried on by the heat of the sun during the day and by the birds only at night. The female bird was secured on 30th June, and by 20th July the male had mated again and commenced a new nest in a tall cajaput, about 50 yards distant from the first nest. All attempts to procure the male failed.

Additional information accompanying the egg (No. 261 AX in the H. L. White Collection) gives the height of the nest as eighty feet from the ground. The nest was subsequently occupied by Brown Falcon *Falco berigora* which reared two broods on 11 October 1909 and 24 December 1909 respectively.

Mr McLennan appears to have been more fortunate in locating Red Goshawks whilst visiting North Queensland on behalf of Dr W. MacGillivray (1914, p. 150). He noted them 'on many occasions at both Sedan and Baromine' in the winter of 1909. One shot as a specimen was eating a Galah at the time and others were seen on the Leichardt and Gregory Rivers.

The size of the Red Goshawk suggests it is a fast fearless powerful hunter and both Campbell and North, again quoting the Barnards, give us some early evidence of its diet. They record the birds killing a White Cockatoo, a Wood Duck, and the discovery of the partly-eaten hind quarters of a Frilled Lizard at the nest, whilst H. G. Barnard refers to

the killing of a Bronzewing Pigeon it had in its talons.

Under the circumstances, Caley's note (North 1912, p. 199) that 'the natives tell me it [the Red Goshawk, Ed.] feeds upon dead fish and the bones which they leave' must be taken with considerable reserve until such time as it is confirmed. One can hardly imagine a Goshawk including dead fish in its regular diet or scavaging for an existence.

Published records dealing with the habits and the ecology of the Red Goshawk are so fragmented and scattered that the detailed observations by the late E. A. R. Lord (1952) are worthy of being quoted from *The Emu* verbatim:

> In September, 1949 a pair of Red Goshawks (Erythrotriorchis radiatus) built their large stick nest in dense foliage at the top of a large spotted gum tree. In September the following year they again showed a desire to use the nest but were attacked by a pair of nesting Black-backed Magpies (Gymnorhina tibicen) whenever they approached the place. A week later I noticed that the Goshawks were using a Crow's old nest some 300 yards distant. A Red Goshawk approached with partly-closed wings and legs down, landed on the side of the structure and moved on to the eggs.
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> During nesting time the Red Goshawk is the terror of the area for some distance from its breeding place. When young are being fed the birds make repeated raids on the nests of other birds, and many distressed parents can be heard endeavouring to defend their young.
>
> Many nests I have had under observation have been robbed of the fledglings they contained. At dawn one morning a Magpie's nest near the house was attacked and a large nestling carried off. The adult Magpies, assisted by other birds, forced the raider to the ground with its prey. When I rescued the young bird I found that it had been badly injured and it died soon afterwards. Recently a pair of Magpie-Larks (Grallina cyanoleuca), with week-old chicks in the nest, was attacked and one nestling carried off. Shortly afterwards the Goshawk returned and took a second bird. A third visit was made and the remaining young bird was eaten at the nest despite the frenzied attempts by the parents and many other birds to drive away the raider.
>
> Some years ago I heard a rushing sound overhead and, upon looking up, I saw a Black-shouldered Kite (Elanus notatus) closely pursued by a large hawk. When the birds reached to within a hundred feet from the ground the Kite quickly turned upwards and passed above its pursuer, which then gave up the chase and passed low over where I was standing. I was able then to identify it as a Red Goshawk.
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> An individual of this species perched daily on a small oak tree by the creek and I was curious to ascertain what was attracting it to the place. One day I saw it capture a young snake about three feet in length and I realised that there had probably been a brood of those reptiles there as I had killed two large red-bellied black snakes at the same place a week previously.
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> The Red Goshawk is a shy bird and can usually be examined only with binoculars from a distance. However, on one occasion I found a bird with a broken leg, which, though otherwise in healthy condition, allowed me to approach to within ten yards and showed no inclination to fly away. On a second occasion a bird perched on a tree in my garden and I viewed it from a distance of 20 yards.
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> The tragic attack on the young Magpie-Larks I have already mentioned took place on December 11. However, the birds used the nest again, and on December 15 material was being added. On December 18 a bird was brooding. The nest was too high to enable me to ascertain its contents so I had to await the arrival of the young birds to continue my notes. On January 8 I heard the soft 'peek-peek' of the female and saw her at the nest feeding young. I always hear this call from the parents when the young are in the early stages of development and surmise that it is the call employed to prepare the young nestlings to accept food. Feeding took place regularly as the young continued growing, and on January 24 three fledglings, well feathered, could be seen standing in the nest.
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> On January 28 the young birds were out of the nest at dawn and were guided by the parents to the thick foliage of a nearby tree. A Red Goshawk came to the nest a few hours after the young had vacated it, but I succeeded in driving it away before any raid could be made on the young Magpie-Larks.

Four years later Lord (1956, p. 107) was able to add the following:

> Red Goshawk. Rather rare, pairs keeping close to their nesting area throughout the year. When breeding, they raid the nests of other birds and carry off nestlings as food (see *Emu*, vol. 52, pp. 23-24). Magpies, Butcher-birds and even crows are sometimes victims of these fierce hunters.

The breeding season extends from May to November but there is little doubt that prevailing local conditions must have an important influence on breeding activities and the movements of individuals as indicated by Bravery (1970, p. 53) who regarded the Red Goshawk as a very rare visitor to the Atherton Shire, where twice single birds arrived at his property on 13 June 1961 and 4 July 1969, both occasions during drought conditions inland and on Cape York.

The size of the clutch is reputed to vary from one to three in number, but sets of three must be extremely rare.

The following descriptions, measurements and annotations relative to clutches of eggs mentioned in literature and others I have been able to locate in the H. L. White Collection and those of the National Museum of Victoria, The Australian Museum, Sydney, and my own collection are both interesting and revealing especially in the case of early sets taken in the days when single eggs were distributed to one's friends and institutions in the interests of science or sold to some ardent collector for cash. It was a time when the clutch was not necessarily retained as a unit nor held sacrosanct as it is today.

Nevertheless the notes and comments do add to our limited knowledge of the Red Goshawk and I shall deal with each item chronologically as far as the available data will allow.

Where measurements have been given in inches they have been converted to metric by using the factor 25.4, giving readings in millimetres to the nearest decimal.

The term 'type set' has been used as one of convenience in lieu of the cumbersome, but more accurate, 'first described set or egg', as the case may be, but it cannot be used in the same sense as we refer to a type specimen or type skin.

● 1. C/2. Regarded as the type set described by Campbell (1900, pp. 10-11) taken by Barnard in September 1884. 'Uniform dull or bluish white. One example of a pair has a few blotches or irregular markings of dark brown.'

As Campbell also gives measurements of two eggs from the problematical clutch of three, doubt remains as to which eggs he had in mind when dealing with colour.

Measurements of his type set are given as:

Specimen A. 2.25 x 1.79 in. = 57.2 x 45.5 mm
Specimen B. 2.17 x 1.82 in. = 54.6 x 46.2 mm

● 2. C/2-3. The problematical clutch of three — two taken by Barnard on the 29 October 1889 and the third egg taken about a month later.

Specimen A. 2.19 x 1.79 in. = 55.6 x 45.5 mm
Specimen B. 2.44 x 1.81 in. = 62.0 x 46.0 mm

● 3. C/2. Alleged by North (1912, p. 199) to be the set taken by Barnard in September 1884 and therefore identical with Campbell's type set. There is however an apparent discrepancy between the two authors as to both colour and measurements. North's measurements being:

Specimen A. 2.2 x 1.83 in. = 55.9 x 46.5 mm
Specimen B. 2.13 x 1.83 in. = 54.1 x 46.5 mm

The discrepancies are all the more interesting when one realises that North's work was published a decade or so after Campbell's and that he must have been familiar with the position. It is indeed a matter of interest how these two gentlemen came by the measurements they used and the colours they adopted in their descriptions.

● 4. C/1. AMO 25501 Coomooboolaroo Qld., 1883. George Barnard *ex* Austin Collection Australian Museum.

No further information, but Wayne Longmore adds (in litt):

Shape — short oval.
Colour — off-white some creamy spots on pointed end.
Register shows this to be the egg described by North but the description does not fit.

The date 1883 is perplexing for it is the date when the first skin was secured. The eggs were not taken until September 1884. It would appear that 1883 has been entered in error for 1884 and that this egg (AMO 25501) is one of the original type set.

Longmore gives the measurements as:

54.7 x 46.0 mm

which is very close to Campbell's measurement of Specimen B.

If North's account is correct, then both eggs of the type set could reasonably be expected to be in the Australian Museum, the first having been sent to Dr Ramsay and the other to North some considerable time later.

I am of the opinion that this specimen, AMO 25501, is in fact one of the type set taken in September 1884.

● 5. C/2. AMO 51881 Qld., Duaringa. Chas. Barnard 7 September 1889. *Ex* Austin Collection Australian Museum, Sydney.

Incubation — rather advanced.
Shape — short oval.
Colour — off-white heavily soiled.

Measurements: Specimen A. 53.8 x 43.7 mm
Specimen B. 54.2 x 44.3 mm

Here again the date is most confusing for it is at least seven weeks earlier than that on which the second known set is alleged to have been taken by the same collector on the 29 October 1889.

All sorts of imponderables come to mind, for the problematical clutch of three may be involved. Could it be that these two eggs are, in fact, the first two of the second known set and that they were secured on 7 September 1889 and the third egg taken 'about a month later' on or about 29 October 1889.

Perhaps this is the point at which I should digress and mention the next egg to be dealt with.

It is in the A. J. Campbell Collection and dated 4 October 1889. Here again the date of the egg caused me some concern as it predated the taking of 'the second set on the 29th October, 1889', but if the second known set was taken on 7 September 1889 then Campbell's egg taken 'about a month later' on 4 October 1889 may conceivably be the elusive third egg of the problematical clutch of three.

By way of explanation, it is fair comment to say that in those early days of our ornithological history many field observers and even more experienced collectors did not keep regular notes. It is apparent that

many of them must have relied upon their memories more heavily than has been realised. When pressed for more accurate details, they probably related the taking of a specimen or of a set of eggs to some domestic or personal incident in their daily lives and fixed a date or a locality accordingly.

Modern researchers and authors are constantly coming across discrepancies and obvious errors which they deplore, often passing hard judgements on an era in which modern facilities and amenities were unknown or the real value of their discoveries unappreciated at the time and therefore not properly documented.

If my assessment of the situation is correct and the dates rearranged to fit into the recorded information available, the position may be summarised to date as follows:

The second nest containing two eggs was taken on 7 September 1889 and the third egg on 4 October 1889. The third egg taken 4 October 1889 is still in Campbell's Collection. One of the original eggs, No. 25501, is in the Australian Museum, but we have no definite information as to the whereabouts of one egg of the type set and the two original eggs of the problematical clutch of three but — note that the date 29 October 1889 would then remain unaccounted for.

● 6. C/1. A. J. Campbell Collection; one egg, *ex* a clutch of three taken by Barnard 4 October 1889, in the National Museum, Melbourne. Measurements: 56.6 x 45.7 mm.

Campbell's statement, 'this is one egg from a clutch of three,' read in the light of the known facts at that time would appear to be conclusive but for the date of collection. This aspect is dealt with at length in considering the case of the previous egg No. 51881.

● 7. C/2. Emerald McKenzie River, Queensland. 16 September 1898. T. Wilson. H. L. White Collection, National Museum, Melbourne.

Set of two eggs acquired by H. L. White when he incorporated the Jacksonian Oological Collection into his own. Jackson's (1907, p. 48) data reads:

> Nest built in large eucalypt at an altitude of 75 feet. One egg (Specimen A) was in a very advanced state of incubation but was successfully emptied of its contents. It measures 2.23 x 1.72 in. [= 56.6 x 43.7 mm]. The other egg (Specimen B) was an addled specimen and was easily blown. Both eggs have very few markings but possess dirty brown or nest stain discolorations. Specimen B has one rich reddish brown dot and a few yellowish brown smears. It measures 2.19 x 1.75 in. [= 55.6 x 44.4 mm].

● 8. C/2. Port Darwin, N.T. J. H. Neimann. 22.5.02 and 27.5.02 in the collection of N. J. Favaloro. Most interesting eggs both scribed by the collector as follows:

Specimen A	Specimen B
Brown With black under wing Hawk 1 in nest 22/5/02	Brown Hawk with black under wing 1 in nest 27/5/02

and further scribed in excellent writing in pencil:

Specimen A	Specimen B
Radiated — Goshawk Port Darwin	Radiated Goshawk

No further details. Measurements:
Specimen A. 56.4 x 43.8 mm Specimen B. 54.4 x 43.2 mm

There can be little doubt that the first egg was taken before the clutch had been completed and the second some five days later. It is, too, a fairly safe assumption that the bird was unknown to Neimann in May 1902. Having taken these aspects into account, I critically examined this set and compared it with a series of raptor's eggs of other species from Northern Australia.

I confined the comparison to measurements as the series of Red Goshawk eggs available was not sufficient to determine the extent to which colour is a variable factor with the species. Nevertheless, I did check the texture of the shell, colour intensity and colour distribution of all eggs examined.

It appeared that the only eggs which might possibly be confused with the Red Goshawk were those of the Little Eagle. Notwithstanding the similarity in measurements, the widest portion of all Red Goshawks was closer to the large end of the egg, thus giving the short or dumpy oval shape so often referred to, rather than the robust globular form (but not spherical) of the Little Eagle.

This set is undoubtedly that of a Red Goshawk. Early this century Neimann collected some excellent material in the vicinity of the Daly River and elsewhere in Northern Australia, but I cannot recall having read a personal contribution in any natural history publication.

J. H. Neimann was regarded as a reliable collector and the H. L. White Collection contains sets of other species taken by him.

● 9. C/1. 261 AX Napier, Broome Bay, N.W. Australia, 1.7.1910. G. F. Hill. H. L. White Collection, National Museum, Melbourne.

This is the egg taken on the point of hatching (Hill 1911) the female having been collected the previous day.

Measurements: 2.16 x 1.73 in. = 57.9 x 43.4 mm.

● 10. C/1. AMO 52088. N.T., Borraloola. H. G. Barnard. 14.9.1913. *Ex* Austin Collection, Australian Museum, Sydney.

This is the hard-set egg referred to in *The Emu* (Barnard 1914, p. 41) and measures 53.7 x 42.2 mm.

● 11. C/2. Set mark 261 Mat. 23^{A} and 23^{B}. N.T., Borraloola. H. G. Barnard in the N. J. Favaloro Collection. 12.9.1913.

Once again Barnard's dates appear to be at variance with his written report (Barnard 1914, p. 41) according to which it was taken a few days before the previous set 52088 but, according to the data from H. L. White, this set was taken a few days before that of the hard-set single clutch.

Measurements: 23^{A} 53.2 x 42.8 mm
23^{B} 54.8 x 43.5 mm

● 12. C/2. 261 BX. 10.10.1913. N.T., Borraloola. H. G. Barnard in the H. L. White Collection, National Museum, Melbourne.

A repeat of the above set which was taken almost a month previously.

Nest a large stick structure placed on a flat fork of a Paper-bark. Nest well lined with green gum leaves. Eggs fresh.

Measurements: Specimen A. 2.07 x 1.67 in. = 52.6 x 42.4 mm
Specimen B. 2.07 x 1.69 in. = 52.6 x 42.9 mm

● 13. C/2. 261 A. 14.9.1914. Nulalabin Station, Dawson River, Queensland. H. G. Barnard in the H. L. White Collection, National Museum, Melbourne:

Nest a large structure placed on a horizontal fork 78 feet from ground in a

Lemon Gum *Eucalyptus citriodora* growing in a deep ravine. Eggs scooped. The female was observed sitting near the nest which had the appearance of being very old and had probably been used in previous years by the same pair of birds. The birds shortly commenced to rebuild and the eggs were taken on the above date being then quite fresh. Three weeks later I again visited the locality and seeing the female sitting on the edge of the nest I thought it probable she had laid again and climbed to the nest, but too soon for a second clutch, a month being the usual term for Hawks between first and second clutches.

Measurements: Specimen A. 2.22 x 1.60 in. = 56.4 x 40.6 mm
Specimen B. 2.08 x 1.62 in. = 52.8 x 41.1 mm

● 14. C/1. British Museum, Tring, England. No data.

Mr I. C. J. Galbraith (in litt.) has indicated that 'Northern Australia' is the only data accompanying this egg.

At the time of going to press the measurements of this specimen are not available.

● 15. C/1. Mary River, Queensland.

Gordon Beruldsen has provided me with the most recent information on the subject. He states (pers. comm.):

The pair had been in very rugged country in the upper reaches of the Mary River for some time. On 28 November 1978 I located the female brooding in a large stick nest in a tall tree growing in the bed of a small dry tributary of the river and at a height of some fourteen metres. On climbing the nest I found it to be well-lined with green gum leaves and containing a single egg which appeared to be very heavily incubated. The egg measured 55.3 x 42.4 mm. After descending the tree I made a very careful search in the dense growth beneath and found the remnants of an egg which I feel sure were the fragmented remains of an egg which the bird had ejected. Although the nest was a bulky structure it appeared to have been freshly constructed that season, but, of course, I am unable to say whether it had been constructed in its entirety by the Goshawks or appropriated by them and renovated to meet their own requirements.

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