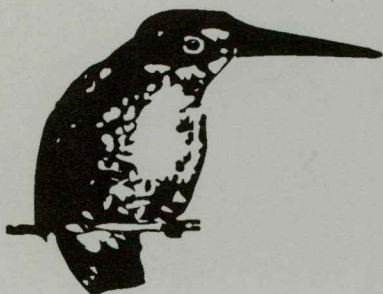


AUSTRALIAN BIRDS



Journal of the
N.S.W. FIELD ORNITHOLOGISTS CLUB
Inc.

Volume 24, Number 4.

June 1991

ISSN 0311-8150

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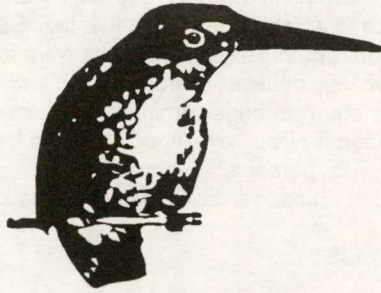
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AUSTRALIAN BIRDS



Volume 24, (4)

June 1991

AN ANNOTATED LIST OF NEW SOUTH WALES RECORDS OF THE RED GOSHAWK

S.J.S. DEBUS

SUMMARY

All known records of the Red Goshawk *Erythrotriorchis radiatus* in New South Wales, 1790-1990, were collated and appraised in connection with a field survey of the species. There were at least five, possibly eight Red Goshawk specimens taken before 1900, a sighting and two clutches taken before 1920, and thereafter no records until the late 1960s, since which there have been on average two acceptable reported sightings per year. Some recent literature reports are rejected. Most recent records are from the extreme north-east corner of the state, in the Northern Rivers region. The goshawk was formerly a breeding resident on the north coast rivers but is now a rare vagrant, virtually extinct as a breeding species in NSW, and urgently in need of active conservation.

INTRODUCTION

Recently, I summarised the status of the Red Goshawk *Erythrotriorchis radiatus* in New South Wales, and the results of a survey of the species in that State (Debus in press). This paper is an ancillary publication. It indicates the basis for acceptance or rejection of all literature records of the species in New South Wales with which I am familiar. These records form the basis of my assessment of the species' past status in New South Wales.

METHODS

Records were accepted or rejected on the existence of specimens or adequate descriptions. Specimen records for New South Wales were extracted from a catalogue of Red Goshawk specimens in the world's museums (Debus & McAllan in prep.). Sightings were obtained from the literature, from the RAOU Atlas of Australian Birds project (unusual record forms) and from informants. Sightings were accepted if written or verbal descriptions were adequate to establish the bird's identity. Site inspections during the survey and the experience of informants as ornithologists were also taken into consideration, and in a few cases (e.g. recently deceased informants) it was necessary to rely to some extent on the person's reputation amongst ornithological colleagues. This approach caused some records provisionally listed by Debus (1982) to be rejected. Several first-hand or second-hand reports, via personal communications, are not listed here because there was insufficient information to establish whether the identification was correct.

ANNOTATED LIST

The list is presented in chronological order, with regions as defined by Morris et al. (1981). Records are coded as accepted (A), unconfirmed (U) or rejected (R), those accepted corresponding to the records in Table 1, Figure 1 and Appendix 1 of Debus (in press). Available descriptions and notes accompanying the records are reproduced here, if they add to published information or help to substantiate the record and any conclusions drawn. In some cases precise locality details have been deliberately withheld.

Central Coast (A)

Specimen collected in or near Sydney before 1800 (the Watling drawings: North 1912, Mathews 1916, Hindwood 1970). There has been a suggestion that it came from Port Stephens (lower Hunter/Mid-north Coast - see Debus 1982), apparently on the basis that the *Salamander*, a First Fleet vessel, visited Port Stephens in 1791 (see Schodde & Weatherly 1982). However, the Red Goshawk drawings have been attributed to the "Port Jackson Painter" active around Sydney from 1788 to the 1790s (Pearce 1989). Furthermore, the fact that the goshawk was found nailed to a settler's hut indicates that it came from the Sydney region. From information in Whittell (1954) and Hindwood (1970), the paintings can be dated to between December 1789 and December 1794, and therefore before the Hunter River was explored in 1797 by Lieut. Shortland (e.g. Bartholomew & Cramp 1966). Field notes on the Red Goshawk painting were in Surgeon-General John White's handwriting, and the painting was not actually signed by Watling (Hindwood 1970). During his stay, White was stationed in Sydney (Whittell 1954), where it is likely that he interviewed the collector. The collector's information on the bird and a copy of the plate (Slater 1978, Pearce 1989) show it to be a juvenile or immature female on size, plumage and eye colour (notwithstanding somewhat conflicting information on its eyes and Pearce's erroneous statement on Red Goshawk soft-part colours; cf. Debus & Czèchura 1988a). There is no evidence that the specimen was preserved or taken with the drawings to England by White in 1794.

Central Coast? (A; region uncertain)

British Museum (Natural History) specimen no. 1863.7.7.6 from "New South Wales" (no other data), "collected by G. Caley" and presented by the Linnean Society as the type of *Haliaeetus caliei* [= *E. radiatus*] (label details per D. Mead). Vigors & Horsfield (1827) were aware of the Watling drawings and of Latham having named *Falco radiatus*, but they named the Caley specimen in the belief that it was a new species, as they compared it with Latham's illustration and pointed out several differences between the two individuals. George Caley was in Australia between 1800 and 1810, and collected specimens in the vicinity of Sydney, the lower Blue Mountains and the Hunter Valley (Currey 1966). The BMNH label implies that he shot the Red Goshawk. From measurements and plumage details supplied by D. Mead, this bird was an immature female, possibly a second-year bird (C. Edelstam). Contrary to Hindwood & McGill (1958), it appears that Caley's was a second specimen within the first 10-20 years of European settlement, and not the same as the Watling bird. In support of this is the condition of the Caley specimen - it is in "excellent condition", and does not look like it was ever nailed to anything (D. Mead pers. comm.). A comparison of colour photographs of the Caley specimens (per D. Mead) and a print of the Watling painting (Pearce 1989, Plate 4, p.18) suggests that they were two different individuals, of two different ages. Caley took field notes on the specimens he collected (e.g. Webb 1990), but in the case of the Red Goshawk specimen there were none published. Field notes assumed to apply to *Haliaeetus caliei* (e.g. by North 1912) apply to *Haliaeetus canorus* [= *Haliastur sphenurus*, Whistling Kite], cf. Vigors & Horsfield (1827), therefore there is no clue to the specimen's precise locality. It could have come from Parramatta, the Hawkebury/Nepean, lower Blue Mountains or Hunter Valley, therefore its provenance is here treated as unconfirmed.

Northern Rivers and Mid-north Coast (A)

John Gould (1843) reported the Red Goshawk to "inhabit the dense brushes" bordering the Manning and Clarence Rivers. [Note correct publication date of Gould's work, i.e. December 1843, from Waterhouse (1885) and Sauer (1982).] Gould himself was never on the Manning or Clarence during his Australian visit (cf. Hindwood 1938, Whittell 1954). However, his other locality records were supported by specimens, and there were two possible contenders for the Manning and Clarence localities in his own collection. Two Red Goshawk specimens, a male and female in the Philadelphia Academy of Natural Sciences (USA), were from "New South Wales" (details per I. McAllan). Originally offered by Gould to the BMNH, they were instead purchased for the Philadelphia Academy in July 1847. They then went to Paris for mounting (where their original labels were removed), and finally reached the Philadelphia Academy in June 1849 (de Schauensee 1951). They were thus probably in Gould's possession in the early 1840s, when he was writing his book, and possibly collected on his behalf when he was in Australia. Charles Coxen, Frederick Strange and Eli Waller were collecting for Gould between Sydney and Brisbane during the relevant period (Whittell 1954, Sauer 1982).

There is also a female Red Goshawk specimen from the Clarence River in the Merseyside Museum, Liverpool (England), donated by T.M. Williams in September 1844 to the 13th Earl of Derby, whom Gould knew (details per I. McAllan). There is no record of the

collector or collection date, but sea travel between Australia and England took many months and there is no record of how long it was in Williams' possession in England. Gould's extensive network of contacts meant that he may have known about the specimen in time for his book. It may even have been a second specimen from the Clarence.

In addition, there was a mounted adult female from "New South Wales" in The Australian Museum by 1876 (Ramsay 1876; no other details given). Gould visited the Museum when he was in Australia (see Gould 1865 under *Ptilonorhynchus holosericeus*), and may have seen this mount. AM P1863, a mounted adult female, is presumably that bird, but details are now lacking. P1863 is a serial number in the Palmer Register, the register of the earliest known Australian Museum material, that is, everything before Ramsay became the curator (I. McAllan pers. comm.). P1863 may be the bird referred to by Ramsay, possibly collected during the Gouldian period, but all one can conclude is that it was collected before 1875, the time of Ramsay's appointment.

Early specimens from "New South Wales" may have come from Queensland before 1859 (when that State was still part of NSW), but apparently neither Gould's two nor P1863 are the "Moreton Bay" specimens noted in Bennett (1837), as these are probably the two now in the Macleay Museum, Sydney (details in prep.). In any case, there are more than enough specimens to account for the Manning and Clarence records, and Gould's work was so meticulous and authoritative that his records are unquestionable.

Region unknown (U)

Kaup (1847) examined a Red Goshawk specimen and named it *Astur testaceus* in the belief that it was a new species, i.e. it was not one of the above specimens (*Falco radiatus* of Latham, *Haliaeetus caliei* of Vigors & Horsfield, or Gould's *Astur radiatus* from the Manning and Clarence Rivers). Kaup gave the locality as "New South Wales" but it is not certain how he acquired the specimen, nor whether it really came from New South Wales or from what is now Queensland. Kaup was Director of the Grand-Ducal Museum at Darnstadt (Whittell 1954), presumably where the specimen was (is?) housed. To date, the only information I have been able to obtain on Red Goshawk specimens in German museums concerns one at Dresden: collected at Cooktown (Queensland) in 1899, i.e. after Kaup's time (per I. McAllan).

Upper Western (U)

According to Sharpe (1874), the British Museum (Natural History) received a mounted specimen from John Gould, obtained on the Darling River at Bourke. If so, Gould must have acquired it after 1865, via another collector. He only mentioned the coastal Manning and Clarence Rivers as localities for the Red Goshawk in New South Wales, and did not mention Bourke or the Darling (Gould 1843, 1865). Red Goshawk is not on his specimen list for inland New South Wales (Hindwood 1938), and Ramsay (1876) did not list Bourke as a locality for the species. Ramsay's tabular list (1878) and revised list (1898) mention "Interior" [i.e. Darling River to Gulf of Carpentaria], which in this context refers to J.B. White's Red Goshawk specimens from the "interior of Queensland" [Mitchell district], in the BMNH (label details per D. Mead). The only Gould specimen now in the BMNH (reg.

no. 1955.6.N.20.3215) is from "Rockingham Bay" (Queensland; details per D. Mead). Ex-BMNH or ex-Gould specimens sent to other museums do not have Bourke or Darling River localities (per D. Amadon, I. McAllan). It is possible that the mount listed by Sharpe was among two consignments of raptors acquired by the BMNH from Gould in 1872 and 1873 (I. McAllan pers. comm.), and that it was destroyed when bombing damaged the public galleries in London during World War 2 (D. Mead pers. comm.). Unfortunately, Gurney (1875) is no help in this regard and to date it has not been possible to determine whether the BMNH registers shed any light. Sharpe himself (1875), in a later discussion of "new" Red Goshawk specimens, made no mention of the Bourke specimen. The Bourke record is thus an unsatisfactory one, but note recent observation on the Barwon River, a tributary of the Darling, listed below.

Northern Rivers (A)

Specimen from the "Richmond River", lodged in The Australian Museum (North 1912). It was collected by Ramsay (1867), who was in the area between September and November 1866 (Whittell 1954). Debus (1982) speculated that the specimen in the Museum public gallery may be this bird, and Holmes (1987) considered the specimen lost or destroyed. However, the specimen is still in the Museum, its identity masked by an error on its new tag and in the computer listing of specimens. AM O.18250 was, according to its new tag and the computer print-out, collected at "Junction Camp, Queensland", but Junction Camp was in New South Wales near Grafton. The specimen's old tag, in Ramsay's handwriting and signed "EPR", says "Junction Camp 23.10.66", and his unpublished manuscript of birds in the Dobroyde Collection says of this specimen "Grafton 14.9.66". Ramsay's unpublished diary of this excursion says that the specimen was collected on 14 September 1866 at the first camp on his trip north, four miles (6 km) from Grafton, and was picked up on his return (hence the discrepancy in dates). AM O.18250 is therefore the "Richmond River" specimen but it was actually collected closer to the Clarence River, in the Clarence watershed. It was, indeed, an "adult male" (Ramsay 1867). Ramsay's specimen was in pursuit of Rainbow Lorikeets *Trichoglossus haematodus*, "which it was endeavouring to catch; its flight [was] remarkably strong and rapid". It was shot when it flew into his camp. Although he described the Red Goshawk as "rare", only having encountered one, he said "I know of no other districts frequented by so many species of the Hawk-tribe as the brushes and flats in the neighbourhood of the Richmond and Clarence Rivers". He recorded 15 identified species (10 collected) and one or two unidentified species in 15 days, some being "very common", and listed another three species collected by Macgillivray including the Square-tailed Kite *Lophoictinia isura* and Black-breasted Buzzard *Hamirostra melanosternon*. The impression of a rich area populated by the endemic raptor genera stands in stark contrast to the present situation of extensively cleared areas and degraded rivers populated mainly by Black-shouldered Kites *Elanus notatus*, Whistling Kites and Australian Kestrels *Falco cenchroides* (pers. obs.; see also Gosper 1986).

Northern Rivers (U)

Broinowski (1891) stated that the Red Goshawk was "found among dense brushes bordering the coast of New South Wales, especially in the vicinity of the northern rivers".

This statement was probably derived from Gould (1843, 1865). However, Broinowski also stated that it "feeds on birds and reptiles, and is very destructive to the poultry of the farmers". Gould was forced to state that nothing was known of its habits and economy, therefore Broinowski must have had sources of information additional to Gould (1843, 1865) and Ramsay (1867). His comments suggest that the Red Goshawk was known to the settlers on the coastal rivers, from whom he presumably obtained this information while writing and illustrating his book in Sydney in the 1880s or while travelling (cf. Mathews 1942). His statement that the goshawk's habitat was "New South Wales" also suggests that he was unaware of specimens, records or other data on it from other States (despite his travels as far as Cooktown in Queensland, which existed as a separate State since 1859). However, the two specimens from Moreton Bay (above), if still in The Australian Museum in Broinowski's time, were collected when Queensland was still part of New South Wales. Thus some of his information could have come from what is now south-east Queensland. Broinowski probably used Australian Museum specimen P1863 (adult female) as a model, because his plate shows an adult female in plumage resembling specimen P1863 (allowing for some fading of this specimen over time). P1863 is presumably the "adult female, mounted" from "New South Wales" listed by Ramsay (1876), but an exact locality cannot now be ascertained (see above).

Hunter (A)

Observed on the upper Hunter River near Scone by ornithologist H.L. White (Hollands 1984), which would have been between 1900 and 1927 (cf. Whittell 1954). White had organised Red Goshawk specimens from interstate for his own collection, so one may assume that his identification was correct. The source of Hollands' information was a personal communication from ornithologist Claude N. Austin who knew the White family; note also Austin's own record for the area (below).

Northern Rivers (A)

Two clutches (both C/1) taken from the lower Richmond Valley (Holmes in Debus 1988, Debus & Czechura 1988b): one from "Tucki Swamp" in or near what is now Tuckean Nature Reserve in September 1911, and one from the nearby Uralba area in October 1917 (historical egg collection of the late Stan Ellis, per G. Holmes; further details in prep.). The area has been extensively cleared, and is no longer suitable for breeding Red Goshawks (pers. obs.).

Northern Tableland (R)

Claimed to have been seen at Ben Lomond in January 1962 (not August 1961 as reported in Debus 1982) by many Gould League observers, but "not listed with absolute certainty" and no details given (Anon. 1962). The locality and habitat (almost alpine, extensively cleared woodland) appear unsuitable. The record may be referable to the dark morph Little Eagle *Hieraaetus morphnoides* which is common on the Northern Tablelands (pers. obs.), or to the Swamp Harrier *Circus approximans* which occurs on lagoons in the region.

Upper Western (R)

Nests with eggs claimed for Narran Lake in the early 1960s (see Cupper & Cupper 1981, Debus 1982). A hearsay report of an atypically large clutch (C/3) in an atypical locality and habitat is rejected in the absence of substantiating details. The record may be referable to the Little Eagle.

Northern Tableland (R)

One bird claimed for the Armidale area in the mid 1960s (see Debus 1982). Recent experience suggests that non-ornithologists frequently misidentify raptors, therefore this unsubstantiated report is rejected; the habitat appears unsuitable.

Hunter (A)

One bird on the upper Hunter River east of Scone in January 1968 (Austin in Wheeler 1968, Debus 1982). The observer had prior experience of the Red Goshawk in the Northern Territory and Queensland. The bird flew and glided slowly past as close as 7 m, then perched in an open tree where it was observed with binoculars at 100 m, near H.L. White's property "Belltrees" (the late C. N. Austin in litt.).

Northern Rivers (A)

One bird at Woolli Lakes, in what is now Yuraygir National Park, July 1968 (Tarburton in Debus 1982). The description on an unusual record form is adequate (per RAOU Atlas of Australian Birds). The pale head described suggests that the goshawk was an adult. The bird was in coastal eucalypt open forest with low scrub, behind old dunes, in the vicinity of a large fresh-water lake (M.K. Tarburton pers. comm.).

Northern Rivers (A)

One or both of a pair seen regularly at Kyogle from February to August 1969 by J. Hobbs (in Debus 1982). They were often soaring in circles in the updraughts high over a forested hill which was surrounded by cleared grazing paddocks and river flats. One was flushed from a perch and slipped rapidly through the trees. The birds were described as similar in underwing markings to a mid-dark Brown Falcon *Falco berigora* but larger, with longer and more strongly barred tail, more spread wing-tips, and a rufous "wedge" formed by the underwing coverts and breast (Hobbs' notes per Atlas of Australian Birds). The birds were resident until Hobbs left in August, but they have not been seen subsequently despite searches by other bird-watchers.

Southern Tableland (U)

A possible record of a pair at Canberra in December 1969 by Slater (1970), an author of bird field guides. However, on the observer's own advice it seems best to regard this record as "extremely doubtful" (Slater 1970), because of the sighting conditions and unusual locality. The purpose of his article was to elicit confirmation from other observers, but none eventuated.

Central-west Slope (R)

Three birds claimed to have been observed near Narromine in December 1969 (Stephens in Wheeler 1970, Debus 1982). The description is insufficient to exclude similar

species. The observer did not claim a positive identification and subsequently conceded a possible misidentification (the late F. Stephens in litt.). On this basis and the unusual number and locality, the record is rejected.

North-west Plain (A)

One bird observed on the Barwon River near Collarenebri in April 1971 (Morris in Debus 1982) by an author of a raptor field guide (Morris 1976). The bird, possibly a female, was in riverine trees (F.T. Morris in litt.).

Northern Tableland (A)

One bird observed on the Dorrigo Plateau in April 1974, also by F.T. Morris (in Debus 1982). A female, it sailed directly overhead several times above riverside forest, and appeared to be resident in the area (F.T. Morris in litt.). The habitat is patchily cleared tall open forest and warm temperate rainforest.

Central Tableland (R)

Nest and egg claimed for Orange area, mid 1970s (see Debus 1982). Another hearsay report of a nest in an atypical habitat and locality, it is rejected in the absence of substantiating details. The record may be referable to the Little Eagle.

Northern Rivers (A)

One bird on the Orara River near Coffs Harbour in May 1976 (G. Holmes in Rogers 1977). It was first seen below canopy level on the edge of wet sclerophyll forest bordering a paddock, but gradually gained height and then made a long, slanting glide several kilometres to the next valley (G. Holmes pers. comm.).

North-west Slope (R)

Two birds reported near Delungra in 1978 (see Debus 1982). Record submitted to the Atlas of Australian Birds but omitted from Blakers et al. (1984). The description on the unusual record form is inadequate to exclude similar species, therefore the record is rejected.

Northern Tableland (A)

Many observations on a tributary of the upper Clarence River north of Tenterfield since 1979, with adequate descriptions (Atlas of Australian Birds files, Passmore 1981, Aiken in Debus 1982); accepted by Blakers et al. (1984). Nine records 1979-1987 apparently involving both sexes, mostly in the breeding season (spring-summer) but also autumn (N. Aiken, M. Passmore, I. Venables pers. comm.), including two in 1987. The records suggest a possibly resident pair, although the goshawks were only seen singly. One was seen chasing Yellow-rumped Thornbills *Acanthiza chrysorrhoa*, taking a Red-bellied Black Snake *Pseudechis porphyriacus*, and causing commotion among nesting Noisy Friarbirds *Philemon corniculatus*; it was often seen soaring quite high with bursts of flapping or, after hunting, sailing rapidly down river towards more heavily timbered country (N. Aiken). A capture of a Noisy Miner *Manorina melanocephala* was observed (Venables 1989), and a male was observed soaring (I. Venables pers. comm.). There have been no

sightings since 1987 (N. Aiken pers. comm. September 1990).

Northern Rivers (A)

One bird observed at Grafton in March 1980 by I. McDonald (in Debus 1982). The description on an unusual record form is adequate (per Atlas of Australian Birds), and was accepted by Blakers et al. (1984). The description (pale face and throat, yellow eye) suggests an adult. The bird was gliding slowly at 7-10 m altitude and made several tight circles before gliding on through an urban/rural interface area.

Northern Rivers (A)

Sightings of 1-2 birds at Ballina in Autumn 1980 by J. Izzard (in Lindsey 1981), who had prior experience of the species in Queensland. The birds were flying low over a creek (J. Izzard pers. comm.).

Northern Tableland (A)

One bird observed in January 1981 by R. & C. Cooper (per Atlas of Australian Birds), but locality is Rocky or Timbarra River east of Glen Innes, not Rocky River west of Uralla as reported in Lindsey (1982). Probably the same bird was seen by E. Finley (in Debus 1982) in what is now the adjoining Washpool National Park in April 1981. Descriptions on unusual record forms are adequate, and the records were accepted by Blakers et al. (1984). On the first occasion the bird flew rapidly, with quick beats and glides, down the length of a cleared creek valley through dry eucalypt forest and open woodland on steep hillsides. On the second occasion, it was sailing along a tall eucalypt forest/rainforest interface about 70 m above the trees. It was considered by R. Cooper to be an immature female on the basis of its size and plumage (ginger underparts), and following reference to literature and specimens in The Australian Museum. Cooper described its flight as "exceptionally quick... goshawk-like but much faster than any other goshawk... difficult to believe that a bird this size (as big as a... Little Eagle...) could fly so fast". Its flight was "like that of a Feral Pigeon [*Columba livia*]... the bird raised its wings quite high when flapping... but barely brought them below the horizontal plane [on the downstroke]. It glided with its wings slightly above the horizontal".

Northern Rivers (R)

A record for Mt Merino in September 1981 (Izzard in Debus 1982 and Holmes 1987) was actually on the Queensland side of the border, and is therefore excluded from New South Wales records.

Northern Rivers (U)

A fleeting glimpse of a bird flying over riverine eucalypt forest on the coast north of the Clarence River in October 1981, obtained by field biologist A.M. Gilmore, an experienced observer. It was thought to be a Red Goshawk but insufficient detail was seen for a positive record (A.M. Gilmore pers. comm.). Although unconfirmed, it is consistent with subsequent records in the area, including the possibility of breeding in 1981-82 and attempted breeding in 1988 (see below).

Hunter (A)

One bird observed north of Singleton in December 1981 by D. Richards (in Lindsey 1982), who had prior experience of the species in Queensland. Probably the same bird was seen by this observer at the same locality in February 1982 (Lindsey 1984). On the second occasion the hawk was unsuccessfully trying to flush a Dusky Moorhen *Gallinula tenebrosa* from bulrushes along a creek. After 3-4 minutes it flew to a perch in a eucalypt, and "its red underparts stood out particularly" (D. Richards pers. comm.).

Northern Rivers (A)

Approximately 1982, two birds perched at The Risk near Kyogle (A. Rayward per G. Holmes). The observation was accepted by Holmes (1987) after discussion with the observer, and is therefore accepted here.

Northern Rivers (A)

Two birds observed at Evans Head in January 1982 by J. Duranti et al., field notes supplied, record accepted by Lindsey (1984) and Holmes (1987). This record was interpreted by Debus & Czechura (1988a,b) as a pair in courtship flight. However, following a reappraisal of the field notes, the receipt of further information from the observer and my recent experience of adult Red Goshawks, it appears that they may have been two birds of the same sex, one probably a begging juvenile. Both were large: described as Whistling Kite size, and therefore probably both females. The calls were not the plaintive yelping or harsh cackling and squawking between adults (cf. Hollands 1984), but were slow repetitive notes like those of the Grey Goshawk *Accipiter novaehollandiae* (J. Duranti pers. comm.). Duranti agreed that the calls were similar to a tape recording of juvenile calls of the New Guinean Chestnut-shouldered Goshawk *Accipiter buergersi*, a close relative of the Red Goshawk. One of the birds was ventrally rufous in colour, a juvenile/immature character in females (adult females being whiter ventrally: Cupper & Cupper 1981, Hollands 1984, Debus & Czechura 1988b, pers. obs.), but the other was observed less closely. The first (rufous) bird circled low (7 m) over open woodland and heath, calling continuously. When the second joined it they spiralled upwards and out of sight, both calling until they soared higher (J. Duranti, field notes). As this observation was at the time of year when fledglings might be expected, it raises the possibility of breeding in the vicinity. The locality is within 10 km of the site of later suspected breeding (see below).

Northern Rivers (A)

Approximately 1982, Tweed Valley below Mt Warning, one bird made repeated visits to a farm to take domestic Guinea Fowl *Numida meleagris* chicks (D. Davidson pers. comm.). This information was also supplied by G. Homes (pers. comm.) and P. Mitchell (Bird Observers Club, unusual sighting reports). The bird was thought to be a male by size, and was quite rufous. Further details unavailable, but I consider this record acceptable after discussion with Davidson, an experienced observer.

Northern Tableland (A)

One bird observed on Koreelah Creek near Woodenbong in April 1983 by G. Holmes (in Lindsey 1985), who had prior experience of the species. The bird was gliding at 50-60

m above the ground, then dived quickly into a dense patch of eucalypts (G. Holmes pers. comm.). A noticeable feature was the deep bill, and it was thought to be a female. The habitat was remnant dry sclerophyll forest and paddocks, with patches of depauperate dry rainforest on steep scree slopes. There is extensive tall forest within 10 km of this locality.

Northern Rivers (A)

One bird observed on the Wilson River near Lismore, in February 1984 (Lindsey 1986, Holmes 1987); observer had prior experience of the species. A male (?), it was perched in the upper branches of a fig *Ficus* sp. in a remnant patch of rainforest, and was harassed by Pied Currawongs *Strepera graculina*. It flew to figs across a clearing, circled a few times then disappeared downstream (G. Holmes pers. comm.).

Northern Rivers (R)

One bird allegedly flushed from the roadside by vehicles between Ballina and Broadwater in July 1985 (Mitchell 1985, Cooper 1989), but the limited description (the late F. Stephens in litt.) applies equally to the Swamp Harrier. Behaviour and habitat (mostly canefields) also strongly suggest Swamp Harrier. My observations of Swamp Harriers under similar conditions in the region reveal that the rufous underparts, barred underwings and tail and long yellow legs could cause confusion with the Red Goshawk. This record is rejected.

Northern Rivers (A)

One bird observed over Bom Bom State Forest near Grafton in August 1985 by D. Geering (in Cooper 1989), an experienced observer familiar with potentially confusing species. The bird was "obviously a goshawk, distinctly larger than Brown [*Accipiter fasciatus*], tail rounded and wings fingered. It was generally very dark, being reddish and heavily marked, particularly the breast, the underwings being the same colour as the breast. The flights and tail were heavily marked, the former showing a faint window". It was circling low over the treetops of Spotted Gum *Eucalyptus maculata* open forest for about 15 minutes (D. Geering pers. comm.). The description suggests an immature female.

Northern Rivers (A)

One bird seen over the Burringbar Range near Murwillumbah in December 1985 by L. Conole (in Holmes 1987, Cooper 1989), an experienced observer familiar with potentially confusing species. It was soaring over a forested ridge (L. Conole per G. Holmes). I consider this record acceptable after discussion with the observer.

Northern Rivers (U)

Several unconfirmed sightings in the New Brighton-Pottsville area in 1985 by A.M. Gilmore, listed as possible misidentifications by Holmes (1987). Brief views were obtained from below of a bird flying over tall paperbark forest: believed to be Red Goshawk but insufficient detail seen to claim a positive sighting (A.M. Gilmore pers. comm.), therefore treated here as unconfirmed.

Northern Rivers (R)

One bird allegedly at Valla in January-February 1986 (Anon. 1986, Cooper 1990) was a Square-tailed Kite. The observer intended to publish a retraction (D. Secomb pers. comm.).

Northern Rivers (A)

Two birds at Stoker near Murwillumbah in early 1986, record accepted by Holmes (1987) after discussion with the observer (Browne in Holmes 1987; Cooper 1990). Perched birds were observed for ten minutes (per G. Holmes).

Northern Rivers (A)

One bird over the Blackwall Range near Wardell in October 1986 (Holmes 1987, Cooper 1990); observer had prior experience of the species. It was flying along a ridge, over a regenerating rainforest canopy at the top of a scree slope (G. Holmes pers. comm.).

Northern Rivers (R)

A hearsay report of alleged breeding in the Ballina region in 1987 (?), listed in Debus (1988), is unverifiable (per G. Holmes) and therefore rejected.

Northern Rivers (A)

One bird was observed by D. Paull, an experienced observer, on the upper Bellinger River above Bellingen in January 1987. The goshawk's boldly barred primaries and tail, rufous upperparts and large legs and feet were noted. It was gliding along the river, peering down, in open vegetation in a partly cleared valley with dense forest on hillsides (D. Paull pers. comm.). I consider this record acceptable after discussion with the observer.

Hunter (A)

One bird was observed at Freemans Waterholes near Cessnock in February 1987 D. Hobcroft (pers. comm.), who had prior experience of the species in Queensland. A brief view was obtained of the bird making a falcon-like stoop, near the forested and partly cleared slopes of the Watagan Mountains. It lacked a black cap or malar stripe, and had a grey face; pale eye; spotted wing coverts with dark centres; reddish-chestnut, dark-streaked underparts; and a long, grey tail with barring. In the stoop, with wings flexed, the tail extended beyond the primaries (D. Hobcroft pers. comm.). The pale face and eye indicate an adult.

North-west Slope (A)

One bird was observed at Cedar Brush Nature Reserve, on the Liverpool Range north-west of Scone in October 1987. Thought to be a female on size, it was perched in open forest near the rainforest edge (the late P.A. Bourke in litt.). Although further details are not available, I consider this record acceptable. The region was assigned as North-west Slope in Debus (in press, Figure 1), on the grounds that the Liverpool Range is a boundary between regions and the range is a westerly spur of the Great Dividing Range in northern New South Wales. However, Cedar Brush is on the south face of the range and thus the sighting was in the upper reaches of the Hunter watershed.

Northern Rivers (A)

One bird was observed over Whian Whian State Forest near Mullumbimby in October or November 1987, by Forestry Commission ranger R. Kooyman, an experienced observer (in Debus 1988). It was identified as a Red Goshawk after reference to literature. The bird was flying through the canopy of regrowth eucalypt forest (R. Kooyman pers. comm.), in an area of eucalypt forest on ridges and subtropical rainforest in gullies. I consider this record acceptable after discussion with the observer.

Northern Rivers (A)

Two sightings of a single bird on the coast north of the Clarence River in October 1987 by D. Stewart (pers. comm.), an experienced observer who has seen the species in the Northern Territory. These records were also accepted by G. Holmes after discussion with the observer. Other reports of 1-2 birds and an allegedly successful nest in this area in 1987 (Debus 1988, 1989, Karplus 1989) could not be confirmed. On three days in September and one day in December 1987 at this site, I did not obtain Red Goshawk sightings and I subsequently found out that the nest report was erroneous. However, a pair was seen in the area in late August and early September 1988 by observers with prior experience of the species. On one occasion the pair performed a courtship flight (Holmes 1989) and on another occasion they mobbed a soaring Wedge-tailed Eagle *Aquila audax* (J. Izzard pers. comm.). I saw no Red Goshawks in November-December 1988 and July 1989 despite intensive searches of a week or more. In September 1989 only one bird was seen, by Parks & Wildlife ranger S. Phillips, an experienced observer and field biologist: a female was located by its calls as it perched in eucalypt open forest on a ridge. The bird was giving harsh repetitive squawks, and allowed a sufficiently close approach to see the big yellow legs (S. Phillips pers. comm.). Phillips, who had extensive prior experience of other raptors, agreed that the calls were similar to a tape-recording of female Red Goshawk calls. The area includes some thousands of hectares of mature eucalypt open forest and woodland, with extensive stands of tall paperbark (*Melaleuca*) forest and mature eucalypt forest along an undisturbed river. These records suggest that a pair may have attempted to breed in the area in 1988, but they could not be found during an intensive nine-day search in late August 1990. The pair is (or was) isolated by the lack of suitable coastal habitat between this site and the Queensland border 120 km away. They may have abandoned the area following a severe wildfire which burnt out virtually the entire reserve in October 1989, causing much tree-crown damage. Few birds were present after the fire, which reduced available prey (pers. obs.).

Northern Rivers (U)

Two pairs allegedly seen near Iluka in January 1988 (Chafer & Morris 1988). The record was obtained via secondary verbal sources by C.J. Chafer (pers. comm.); and should have read "two birds probably nesting in the Iluka district". This was based on repeated sightings of 1-2 birds in riverine forest (some of these reported in Debus 1988), and suggests that the birds were present from September 1987 to January 1988 (cf. above sightings). However, no descriptions were supplied in support of the sightings and the nest claim was an assumption only.

DISCUSSION

As discussed elsewhere (Debus in press), the pattern of historical and recent records suggests that the Red Goshawk's status in New South Wales has changed considerably since European settlement: breeding resident to rare vagrant in 200 years. It appears that in the first hundred years at least, it was numerous enough to attract the attention of settlers and the few active ornithologists, despite the low human population. It occurred on many of the coastal rivers north of Sydney, and bred on at least some of them. New South Wales was therefore not marginal to its breeding distribution, *contra* Debus (1982).

The number and distribution of early Red Goshawk specimens from New South Wales are quite remarkable, and indicate a formerly more numerous bird south to Sydney in the 1800s and early 1900s. Even without resolving the Bourke question at this stage, there are sufficient specimens and other records to suggest some pattern - virtually all early records were from the largest, formerly forested coastal river valleys where the coastal plain is widest (Richmond, Clarence, Manning, Hunter and Cumberland Plain).

Today, despite the vast increase in observer numbers, effort and ability, there are few Red Goshawk sightings per year (average two per year since 1968) and there has been no confirmed breeding in the past 70 years. The apparent increase in sightings since 1970 may reflect an increase in vagrants following habitat clearance (in south-east Queensland as well as NSW), but it may more likely be a reflection of the growth in ornithology, greater interest in the species and the greater incentive to report sightings through atlas schemes and annual bird reports. There were no reported sightings during 1920-1960. However, many of the 30 or so regional bird lists from within the range of the Red Goshawk in New South Wales, published in *The Emu* 1900-1970, resulted from single visits of a few days to the respective localities - hardly sufficient time to detect a bird like the Red Goshawk.

I have concluded (Debus in press) that the Red Goshawk has declined from a scarce resident breeding north of the Hunter River, to virtual extinction as a breeding species in New South Wales, though it may still breed on the coast north of the Clarence River. I have therefore recommended that it be transferred from Schedule 12, Part 2 of the National Parks and Wildlife Act (vulnerable and rare fauna) to Part 4 (fauna in imminent danger of extinction in the State). The Red Goshawk is now classified nationally as "vulnerable", deforestation having been identified as a major threat (Brouwer & Garnett 1990). According to Brouwer & Garnett's criteria, it should be classified as "endangered" in New South Wales, meaning that its survival [as a breeding species] is unlikely if causal factors continue to operate.

From site inspections during the survey, and an analysis of the situation in south-east Queensland (Debus & Czechura 1988b), I speculate that the Red Goshawk is now virtually absent from New South Wales because its prime habitat has been cleared or severely modified. My experience in the Northern Territory suggests that the goshawk prefers open forest or tall woodland of mature eucalypts with massive limbs and an open canopy

structure, on productive sites (particularly river valleys) rich in birds. Such habitat on fertile soils in north-east New South Wales has been cleared and fragmented. Most remnants on fertile soils are intensively managed for timber as dense, young even-aged stands, whereas remnants in conservation reserves are generally on low-fertility soils poor in birds (pers. obs.). It is difficult to avoid the conclusion that the Red Goshawk has virtually gone, and that the prognosis is not good without immediate action.

Following Cooper (1989, 1990), I urge observers to fully document all sightings of the Red Goshawk in New South Wales. Existing unconfirmed records and future sightings await publication with adequate details of identification. It is important to record habitat and behavioural details, and size and plumage to ascertain the birds' age and sex. Such co-operation by observers is of great value, as the Red Goshawk is a difficult bird to find in the south-east of its range for study purposes. Most of the Red Goshawk nests studied by the Royal Australasian Ornithologists Union in the Northern Territory in 1987-89 were located by interested informants (including one by an FOC party); similar co-operation is required in New South Wales, for ecological studies on the remaining pair(s) while there is still time. However, the locations of pairs or nests should not be publicised. The appropriate action is to submit full details in confidence to the Club's Records Officer, and not divulge the information to any persons except for the purpose of official research and conservation. Observers should be alert to egg collectors attempting to locate nests.

FIELD IDENTIFICATION

Since my earlier paper (Debus 1982), the Red Goshawk's field characters have been described and illustrated in photographic books and a review paper, with colour photographs of birds in flight (Cupper & Cupper 1981, Hollands 1984, Debus & Czechura 1988a). As noted by Brickhill (1991), an additional field character is the short occipital crest (slightly projecting crown feathers), and the legs of juveniles may be yellow rather than pale grey. Perhaps the legs of collected juvenile specimens quickly fade. Further field experience indicates that Red Goshawks often glide on wings with a slight dihedral rather than bowed. Age and sex criteria are given by Aumann & Baker-Gabb (1991); it is worth noting that amid the early confusion, Mathews (1916) got the ventral plumages of adult male, adult female and "immature" [= juvenile] essentially correct.

An important aspect of raptor field identification is the bird's shape and flight behaviour. This is often neglected in field descriptions (with the notable exception of R. Cooper's, above), yet the way a raptor holds and flaps its wings is often the best clue to its identity. It is worth noting that, contrary to Baker-Gabb (1988), the early collectors were well aware of the Red Goshawk's speed (e.g. the Watling notes, widely quoted by North 1912, Mathews 1916, Hindwood 1970 and Slater 1978; also Ramsay 1867, quoted above).

ACKNOWLEDGEMENTS

Red Goshawk records and notes were provided by: N. Aiken, the late P.A. Bourke, A. Colemane, L. Conole, D. Davidson, J. Duranti, D. Geering, D. Hobcroft, G. Holmes, J.

izzard, R. Kooyman, M. Passmore, D. Paull, S. Phillips, D. Richards, D. Stewart and I. Venables. I thank them, and the following for responding to requests for information: N. Ardell, C.J. Chafer, R.M. Cooper, J. Ewin, A.M. Gilmore, D. Milledge, P. Mitchell, D. Secomb and the late F. Stephens. Dr Stephen Davies (RAOU) provided access to RAOU Atlas data, Patricia White (RAOU librarian) and Chris Pavey provided literature, and Walter Boles, David Mead, Dr Dean Amadon and Clem Fisher provided access to or notes on Red Goshawk specimens in the Australian Museum, British Museum (Natural History), American Museum of Natural History and Merseyside Museum respectively. Ian McAllan and Joan Webb provided valuable information and comments, and spent much time tracking down reference material, that helped unravel the details of the early specimens. I thank Mitchell Library staff for access to the Watling drawings and E.P. Ramsay's unpublished diaries, and Ian McAllan for facilitating this and for commenting on a draft of this paper. David Baker-Gabb, Cindy Hull, Tom Aumann, Chris Chafer and Alan Morris also commented on various drafts.

REFERENCES

- Anon. 1962. Bird list on Mr Trevor Judge's property at Ben Lomond. *Gould League Notes* 28, 11-14.
- Anon. 1986. Observations. *NSW Field Ornithol. Club Newsl.* 93, 8.
- Aumann, T. & D.J. Baker-Gabb. 1991. A management plan for the Red Goshawk. *RAOU Report* 75.
- Baker-Gabb, D. 1988. Australia's rarest bird of prey. *GEO* 10(4), 12-13.
- Bartholomew, J. & K.R. Cramp. 1966. *The Australasian School Atlas*, 4th edn. London: Oxford University Press.
- Bennett, G. 1837. *A Catalogue of the Specimens of Natural History and Miscellaneous Curiosities Deposited in the Australian Museum*. Sydney: James Tegg & Co.
- Blakers, M., S.J.J.F. Davies & P.N. Reilly. 1984. *The Atlas of Australian Birds*. Melbourne: Melbourne University Press.
- Brickhill, T. 1991. An observation of fledgling Red Goshawks. *Aust. Bird Watcher* 14, 32-33.
- Broinowski, G.J. 1891. *The Birds of Australia*, vol. 6. Melbourne: Charles Stuart & Co.
- Brouwer, J. & S. Garnett. 1990. Threatened birds of Australia, an annotated list. *RAOU Report* 68.
- Chafer, C. & A.. Morris. 1988. Unusual records - February and March. *NSW Field Ornithol. Club Newsl.* 106, 5-6.
- Cooper, R.M. 1989. New South Wales bird report for 1985. *Aust. Birds* 22, 1-52.
- Cooper, R.M. 1990. 1986 New South Wales bird report. *Aust. Birds* 23, 68-101.
- Cupper, J. & L. Cupper. 1981. *Hawks in Focus*. Mildura: Jaclin.
- Currey, J.E.B. 1966. *Reflections on the Colony of New South Wales: George Caley*. Melbourne: Lansdowne.
- Debus, S.J.S. 1982. Range and status of the Red Goshawk in New South Wales. *Aust. Birds* 16, 41-45.
- Debus, S. 1988. Survey of the Red Goshawk in north-eastern New South Wales. Unpubl. report to NSW National Parks & Wildlife Service.
- Debus, S. 1989. Red Goshawk in New South Wales. *Australasian Raptor Assoc. News* 10, 4.
- Debus, S.J.S. In press. The status of the Red Goshawk *Erythrotriorchis radiatus* in New South Wales. In Olsen, P.D. & T. (Eds.), Proc. Australasian Raptor Assoc. 10th Anniv. Conference, Canberra 1989.
- Debus, S.J.S. & G.V. Czechura. 1988a. Field identification of the Red Goshawk *Erythrotriorchis radiatus*. *Aust. Bird Watcher* 12, 154-159.
- Debus, S.J.S. & G.V. Czechura. 1988b. The Red Goshawk *Erythrotriorchis radiatus*: a review. *Aust. Bird Watcher* 12, 175-199.

- de Schauensee, R.M. 1957. On some avian types, principally Gould's, in the collection of the Academy. *Proc. Acad. Nat. Sci. Phil.* **109**, 123-146.
- Gosper, D.G. 1986. Birds in the Richmond River district, N.S.W., 1973-1983. I. Distribution. *Corella* **10**, 1-16.
- Gould, J. 1843. *The Birds of Australia*, vol. 1. London: the author (facsimile, Lansdowne, Melbourne 1972).
- Gould, J. 1865. *Handbook to the Birds of Australia*, vol. 1. London: the author (facsimile, Lansdowne, Melbourne 1972).
- Gurney, J.H. 1875. Notes on "A Catalogue of the Accipitres in the British Museum" by R. Bowdler Sharpe (1874). *Ibis* **5** (ser. 3), 353-370.
- Hindwood, K.A. 1938. John Gould in Australia. *Emu* **38**, 95-118.
- Hindwood, K.A. 1970. The "Watling" drawings, with incidental notes on the "Lambert" and the "Latham" drawings. *Proc. Roy. Zool. Soc. NSW* **1968-1969**, 16-32.
- Hindwood, K.A. & McGill, A.R. 1958. *The Birds of Sydney*. Sydney: Royal Zoological Society of NSW.
- Hollands, D. 1984. *Eagles, Hawks and Falcons of Australia*. Melbourne: Nelson.
- Holmes, G. 1987. Status of rare birds in the Tweed Volcano Region. Unpubl. report to NSW National Parks & Wildlife Service.
- Holmes, G. 1989. Red Goshawk courtship flight. *Australasian Raptor Assoc. News* **10**, 74.
- Karplus, E. 1989. Status of Red Goshawk in NSW. *NSW Field Ornithol. Club Newsl.* **112**, 10.
- Kaup, J.J. 1847. Monographien der Genera der Falconidae. *Isis* (Oken) **40**(5), 325-386.
- Lindsey, T.R. 1981. New South Wales bird report for 1980. *Aust. Birds* **16**, 1-23.
- Lindsey, T.R. 1982. New South Wales bird report for 1981. *Aust. Birds* **17**, 1-26.
- Lindsey, T.R. 1984. New South Wales bird report for 1982. *Aust. Birds* **18**, 37-69.
- Lindsey, T.R. 1985. New South Wales bird report for 1983. *Aust. Birds* **19**, 65-100.
- Lindsey, T.R. 1986. New South Wales bird report for 1984. *Aust. Birds* **20**, 97-132.
- Mathews, G.M. 1916. *The Birds of Australia*, vol. 5. London: Witherby.
- Mathews, G.M. 1942. G.J. Broinowski. *Emu* **41**, 195-199.
- Mitchell, P. 1985. Unusual sighting reports series 54. *Bird Observer* **647**, 123-124.
- Morris, A.K., A.R. McGill & G. Holmes. 1981. *Handlist of Birds in New South Wales*. Sydney: NSW Field Ornithol. Club.
- Morris, F.T. 1976. *Birds of Prey of Australia, A Field Guide*. Melbourne: Lansdowne.
- North, A.J. 1912. *Nests and Eggs of Birds Found Breeding in Australia and Tasmania*, vol. 3. Sydney: Aust. Museum.
- Passmore, M. 1981. Notes on the Red Goshawk. *Bird Observer* **594**, 57.
- Pearce, B. 1989. *Australian Artists, Australian Birds*. Sydney: Angus & Robertson.
- Ramsay, E.P. 1867. Note on the nidification of *Baza subcristata*. *Proc. Zool. Soc. London* **1867**, 392-394.
- Ramsay, E.P. 1876. *Catalogue of the Australian Accipitres or Diurnal Birds of Prey Inhabiting Australia, in the Australian Museum*. Sydney: Aust. Museum.
- Ramsay, E.P. 1878. Tabular list of all Australian birds at present known - showing the distribution of the species. *Proc. Linnean Soc. NSW* **2**(2), 177-212.
- Ramsay, E.P. 1898. *Catalogue of the Australian Birds in the Australian Museum, at Sydney, N.S.W. Part 1, Accipitres*. 2nd edn with additions by A.J. North. Sydney: Aust. Museum.
- Rogers, A.E.F. 1977. New South Wales bird report for 1976. *Aust. Birds* **11**, 81-104.
- Sauer, G.C. 1982. *John Gould the Bird Man: A Chronology and Bibliography*. Melbourne: Lansdowne.
- Schodde, R. & R.G. Weatherly. 1982. *The Fairy-wrens*. Melbourne: Lansdowne.
- Sharpe, R.B. 1874. Catalogue of the Accipitres, or diurnal birds of prey, in the collection of the British Museum. In *Catalogue of the Birds in the British Museum*, vol. 1. London: British Museum.
- Sharpe, R.B. 1875. Contributions to a history of the Accipitres or birds of prey - notes on the rarer Accipitres of Australia. *Proc. Zool. Soc. London* **1875**, Oct. 1, 337-339.
- Slater, P. 1970. Red Goshawks in Canberra? *Canberra Bird Notes* **1**(6): 23-24.

- Slater, P. 1978. *Rare and Vanishing Australian Birds*. Adelaide: Rigby.
- Venables, I. 1989. Red Goshawk takes Noisy Miner. *Australasian Raptor Assoc. News* 10, 74.
- Vigors, N.A. & T. Horsfield. 1827. A description of Australian birds in the collection of the Linnean Society; with an attempt at arranging them according to their natural affinities. *Trans. Linnean Soc. London* 15, Feb. 15, 170-331.
- Waterhouse, F.H. 1885. *The Dates of Publication of some of the Zoological Works of the Late John Gould, FRS*. London: Porter.
- Webb, J. 1990. Caley's birds: a little known thing. *Aust. Nat Hist.* 23, 360-361.
- Wheeler, R. 1968. Bird notes 1967-68. *Bird Observer* 442, 3-8.
- Wheeler, R. 1970. Bird notes 1969-70. *Bird Observer* 468, 4-8.
- Whittell, H.M. 1954. *The Literature of Australian Birds*. Paterson Brokensha, Perth.

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AN ANALYSIS OF THE RECORDS OF THE CRESTED HAWK IN THE SYDNEY REGION AND AN OBSERVATION OF THE SPECIES AT APPIN

KEVIN MILLS

INTRODUCTION

The Crested Hawk or Pacific Baza *Aviceda subcristata* occurs in Australia and New Guinea (Blakers, Davies and Reilly 1984). The species has a near-coastal distribution in Australia, ranging from the Kimberley Region of Western Australia to central New South Wales. Subspecies have been recognised (eg. Condon 1975), the subspecies in New South Wales being designated as *Aviceda subcristata subcristata*.

Over its range, the Crested Hawk is generally regarded as being scarce to uncommon, particularly in the south of its range (eg. Condon 1975; Roberts 1979; Morris, McGill and Holmes 1981; Slater, Slater and Slater 1988) although it is not considered to be threatened or endangered (Brouwer and Garnett 1990; Kennedy 1990). At the southern limit of its range in New South Wales, the species is rare (eg. Hindwood and McGill 1958; Gibson 1977).

In the Atlas of Australian Birds, the Crested Hawk is recorded as far south as the Sydney area (1° grid square 34/150). The most southerly location reported appears to be Moruya (Morris *et al.* 1981), although this record is not substantiated by any of the other literature; the species is not listed in the literature for the birds of this area (E.H.N.S. 1989; Nix and Brooker 1978; Disney 1979). Condon (1975) reported "stragglers recorded as far south as Sydney".

The Crested Hawk is reported as feeding mainly on invertebrates such as stick insects, praying mantises and grubs, although frogs and lizards, and possibly small mammals are also taken (eg. Cupper and Cupper 1981; Blakers *et al.* 1984). Insects are often taken from the outer foliage of trees.

AN OBSERVATION OF THE CRESTED HAWK AT APPIN

An observation of the Crested Hawk in the Illawarra district was made by the author on 27 November 1989. The location was Macquariedale Road, which runs westwards from the settlement of Appin, south of Campbelltown. Details of the sighting are given below.

Location: Macquariedale Road, Appin (34°10'45"S150°44'50"E)
Time/Date: 1500-1520hrs (summer time) on 27 November 1989.
Observers: Kevin Mills and Jacqueline Jakeman.
Habitat: Remnant woodland on Wianamatta Group soil, consisting of the following tree species: *Eucalyptus tereticornis*, *E. fibrosa*, *Melaleuca stypheliodes* and *Acacia mearnsii*. The understorey was grazed and contained few shrubs. An open forest with a dense understorey occurs in the gorge of the Nepean River, approximately 200 metres to the west.

Notes: The bird was first observed as it flew through a tree canopy carrying a part of a tree branch and alighted on a limb of a tree about 30 metres from the observers. It was immediately recognised by the author as a Crested Hawk, exhibiting a characteristic crest, a strongly barred chest and yellow eyes. The bird was later independently identified by the second observer using the drawing in Slater *et al.* (1988).

The bird remained on the limb eating a very large green caterpillar that was attached to the tree branch it was carrying. This was probably the larvae of the Emperor Gum Moth *Antheraea eucalypti*. The bird flew away after about ten minutes and, after flying into the canopy of a Forest Red Gum *E. tereticornis* tree nearby, it emerged with a second branch with another large green caterpillar attached. Again, the bird stood on a limb about 20 metres from the observers in clear view and proceeded to eat the caterpillar. After about 20 minutes the observers left the area and the bird was not relocated on our return about an hour later. The colouring of the bird suggested that it was a subadult, having more brown on its back than a mature bird.

THE CRESTED HAWK IN THE SYDNEY REGION

Records of the Crested Hawk in the Sydney Region were obtained from all of the available literature, including the records of the New South Wales Field Ornithologists Club published in *Australian Birds* as annual reports and from Mr. A.K. Morris, who kindly provided records from his files and those of the Cumberland Bird Observers Club. The records of the Crested Hawk in the vicinity of Sydney and Wollongong, where the species is at its southern limit of distribution, are summarised in Appendix 1. The locations of all the sightings of the Crested Hawk in the Sydney Region, as listed in Appendix 1, are shown in Figure 1.

The records of the Crested Hawk in the Sydney Region indicate that since 1974 there have been up to six records of the species per year, although in eight of the 17 years there was only one or no records. There has been a steady increase in the number of birds seen during the period although the number of sightings each year has remained similar. There is, however, a distinct cycle in the number of annual records of the species (see Figure 2).

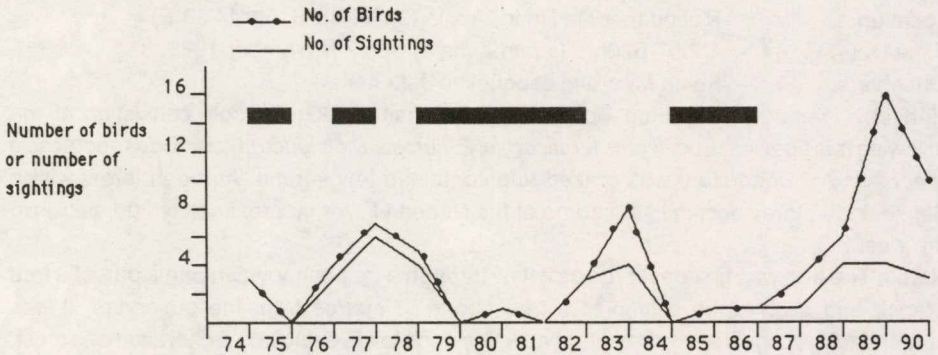
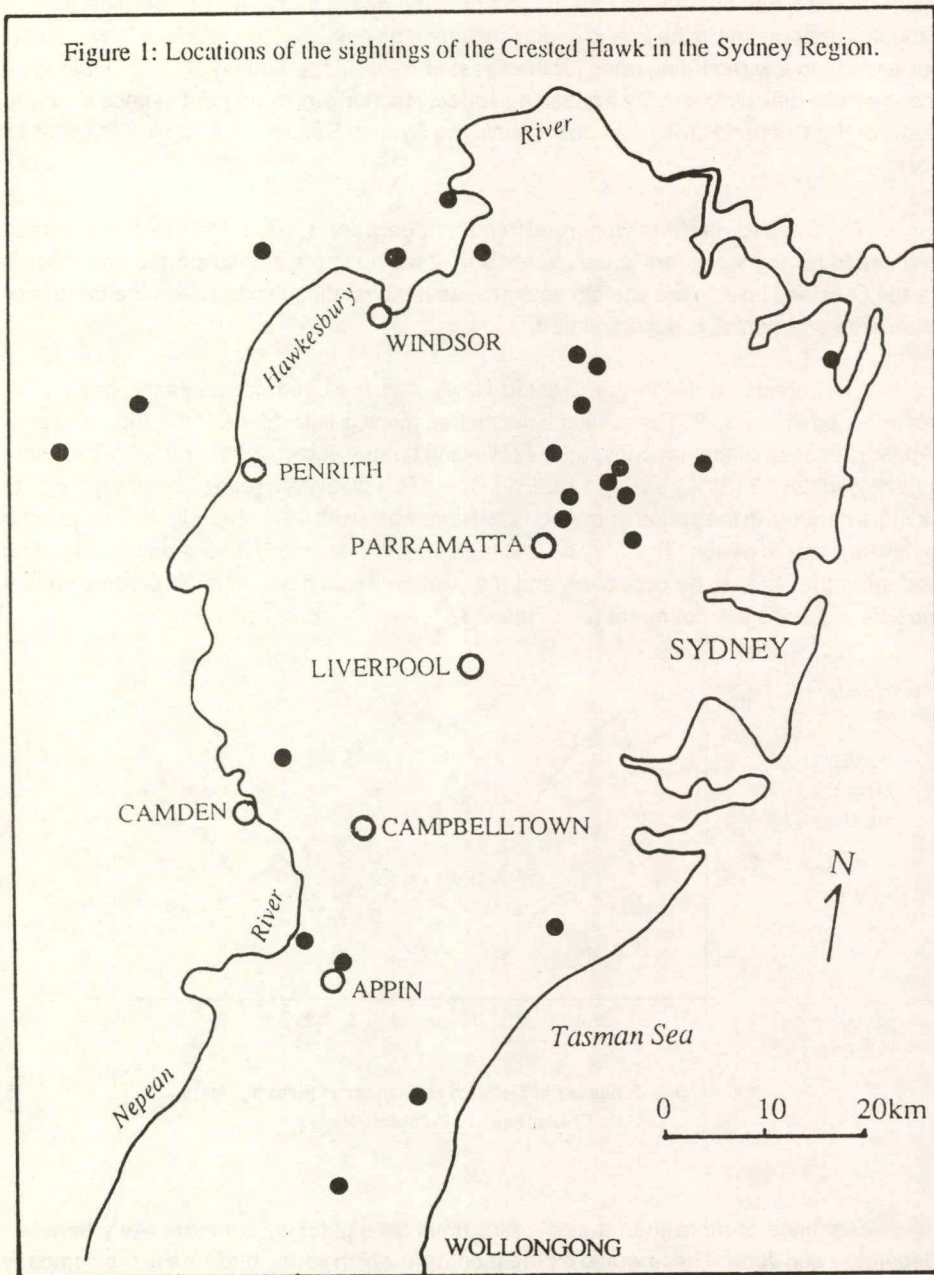


Figure 2: Number of Sightings and Number of Birds by Year, the Crested Hawk in the Sydney Region. Black bars indicate periods of lower rainfall.

The records of the Crested Hawk in the Sydney Region appear to follow a five or six year cycle. According to the records collected, there is an increase in the number of sightings about every five years, with few or no records in the intervening years.

The periods with a low recording rate for the Crested Hawk appear to correlate with years of lower average rainfall, as recorded at the Observatory Hill climate station in Sydney.

Figure 1: Locations of the sightings of the Crested Hawk in the Sydney Region.



As shown in Figure 2, there were low rainfall years between 1979 and 1982, which was a major drought, and in 1985 and 1986, when rainfall was just above average. There was a much higher rainfall in the previous and succeeding years. These periods of lower rainfall correspond to low recording rates for the Crested Hawk in the Sydney Region. Although it may be more difficult to identify a cause and effect mechanism, during wet periods it is more likely for the Crested Hawk to be observed in the Sydney Region, at least over the past 17 years.

The Crested Hawk was recorded frequently between 1987 and 1989, corresponding to a period of very wet years since about 1987. It will be interesting to monitor the records for the Crested Hawk in the coming years to see if the relationship between the frequency of records and rainfall is substantiated.

The months in which the Crested Hawk was recorded, for all years, have been summarized in Figure 3. The results indicate that there is little difference in the number of sightings in each of the seasons, as the following figures show: summer 9 (23%); autumn 8 (20%); winter 12 (30%); spring 11 (28%). There is, however, a tendency for sightings to be more frequent in the period from August to November, with 40% of the sightings occurring in this four month period. This may be because the birds are more mobile prior to breeding and are more likely to be observed, and the younger birds have left their parents so that multiple sightings are not made (see Figure 3).

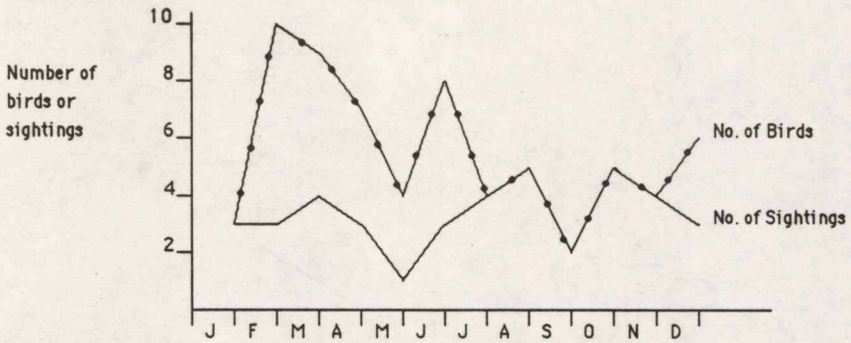


Figure 3: Number of Sightings and Number of Birds by Month, the Crested Hawk in the Sydney Region.

Sightings of more than a single bird (multiple sightings) are more likely between December and June. These would be the months in which young birds are in the company

of their parents. Multiple sightings of birds have been regularly made since 1983; prior to this, sightings were almost entirely of single birds (see Appendix). These multiple sightings have usually been made in the Dural area to the north-west of Sydney. There has been at least one breeding pair in the Dural area for some years although, unfortunately, there are no nest records in the Nest Record Scheme (J. Starks, RAOU, Melbourne, pers. comm., Nov. 1990).

CONCLUSIONS

The Crested Hawk is an uncommon to rare bird over its range and, in New South Wales, is listed on Schedule 12 of the National Parks and Wildlife Act 1974 (as amended) as fauna which is "vulnerable and rare". In the south of its range in the Sydney Region, the bird is scarce, although in most years since 1974 there have been several records. In the last three years there has been an increase in the number of birds observed but not in the number of sightings. This situation is the result of the presence of at least one breeding pair in the Dural area, so that young birds are observed in the late summer and autumn period with several records of between three to five birds.

The Crested Hawk is probably a straggler to the Sydney Region of New South Wales, where it is at its southernmost limit of distribution. From 1974 to 1990 there has been a cyclic pattern in the recording rate of the species in the Sydney Region and this appears to be correlated with rainfall; there are a few sightings in years of lower rainfall.

Crested Hawks can be observed in the Sydney Region in any month, although there is a tendency towards more sightings in spring and more birds in late summer and autumn, following breeding. The most likely location for sightings is to the north-west of Sydney in the Dural area, where breeding apparently now takes place every year.

The feeding behaviour of the Crested Hawk observed by the author at Appin appears to be very characteristic of the species as noted by other observers (eg. Readers Digest 1979; Cupper and Cupper 1981; Lord 1956).

During the preparation of this paper, another observation of the Crested Hawk was made in the southern Sydney Region. This was at the Upper Causeway in Royal National Park on 3 April 1991 and follows an earlier observation of the species at the same location on 27 January 1991 (FOC Newsletter No. 124). The bird observed by the author was in a large eucalypt emerging from a dense canopy of warm temperate rainforest. The bird was in clear view for the time it was under observation and was about 30 metres from the observer.

Future observations of the species in the Sydney Region, particularly in relation to its breeding habits, will clarify the status of the species at its southern limit of distribution.

REFERENCES

- Blakers, M., Davies S.J.J.F. & P.N. Reilly, (1984) *The Atlas of Australian Birds*. Melbourne: RAOU.
- Brouwer J. & Garnett S. (1990) (eds.) *Threatened Birds of Australia, An annotated List*. RAOU Report Number 68, RAOU/ANPWS, Melbourne.
- Condon, H.T. (1975) *Checklist of the Birds of Australia. Part 1. Non-passerines*. Melbourne: RAOU.
- Cooper, R.M. (1989) NSW Bird Report for 1985. *Aust. Birds* 22:1-40.
- Cupper, J. & L. Cupper. (1981) *Hawks in Focus*. Mildura: Jaclin Enterprises.
- Disney, H.J.de (1979) RAOU, Pilot Atlas Scheme. *Corella* Vol. 2, Suppl., July.
- Eurobodalla Natural History Society (1989) *Nature in Eurobodalla*. No.3. Annual Record for 1988. Eurobodalla Natural History Society, Moruya, November.
- Gibson, J.D. (1977) The Birds of the County of Cambden (including the Illawarra District). *Aust. Birds* 11:41-80.
- Hindwood, K.A. & A.R. McGill (1958) *The Birds of Sydney (County of Cumberland), New South Wales*. Sydney: The Royal Zoological Society of New South Wales.
- Illawarra Bird Observers Club (1989) The Birds of the County of Camden (including the Illawarra District). Wollongong: The Illawarra Bird Observers Club.
- Kennedy, M. (1990) (ed.) *Australia's Endangered Species*. Brookvale: Simon & Schuster.
- Lindsey, T.R. (1979) NSW Bird Report for 1978. *Aust. Birds* 14:1-22.
- Lindsay, T.R. (1984) NSW Bird Report for 1982. *Aust. Birds* 18:37-69.
- Lindsay, T.R. (1985) NSW Bird Report for 1983. *Aust. Birds* 19:65-100.
- Lord, E.A.R. (1956) The Birds of the Murphys Creek District, Southern Queensland. *The Emu* 56:100-128.
- Morris, A.K. (1975) The Birds of Gosford, Wyong and Newcastle (County of Northumberland). *Aust. Birds* 9:37-76.
- Morris, A.K., A.R. McGill & G. Holmes (1981) *Handlist of Birds in New South Wales*. Dubbo: NSWFOC.
- National Parks and Wildlife Service (1977) *The Birds of the Royal National Park*. Sydney: NPWS.
- Nix, H.A. & M.G. Brooker (1978) *Birds, in Land Use on the South Coast of New South Wales*. Vol. 2 - Biophysical Background Papers. Canberra: CSIRO.
- Readers Digest (1979) *Readers Digest Complete Book of Australian Birds*. Sydney: Readers Digest.
- Roberts, G.J. (1979) *The Birds of South-East Queensland*. Brisbane: Queensland Conservation Council.
- Rogers, A.E.F. (1975) NSW Bird Report for 1974. *Aust. Birds* 9:77-97.
- Rogers, E.A.F. (1977) NSW Bird Report for 1976. *Aust. Birds* 11:81-104.
- Rogers, E.A.F. & T.R. Linsey (1978) NSW Bird Report for 1977. *Aust. Birds* 13:1-22.
- Slater, P., Slater P. & R. Slater (1988) *The Slater Guide to Australian Birds*. Rigby: Dee Why West: Rigby Publishers.

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Appendix 1**Records of the Crested Hawk in the Sydney Region, New South Wales.**

Location	Date	Reference
Cordeaux River (near Wollongong)	1880	Gibson (1977)
Pittwater (Sydney)	Jul.1923	Hindwood and McGill (1958)
Upper Causeway, Royal National Park	29 Dec.1955	Hindwood & McGill (1958); NPWS (1977)
Thornleigh (Sydney)	27 Jul.1974	Rogers (1975)
Murphys Glen (Blue Mountains)	23 Nov.1974	Rogers (1975)
Thornleigh (Sydney)	24 Nov.1974	Rogers (1975)
Beecroft (Sydney) (pair)	June 1976	Rogers (1977)
Thornleigh (Sydney)	6 Oct.1976	Rogers (1977)
Sackville (western Sydney)	16 Oct.1976	Rogers (1977)
Thornleigh (Sydney)	14 Jan.1977	Rogers and Lindsey (1978)
Boronia Park, Epping (2) (Sydney)	22 Mar.1977	Rogers and Lindsey (1978)
Thornleigh (Sydney)	20 Aug.1977	Rogers and Lindsey (1978)
Lake Parramatta (Sydney)	8 Oct.1977	Rogers and Lindsey (1978)
Blue Gum Creek, Springwood	8 Oct.1977	Rogers and Lindsey (1978)
Thornleigh (Sydney)	21 Oct.1977	Rogers and Lindsey (1978)
Thornleigh (Sydney)	29 Mar.1978	Lindsey (1979)
West Pennant Hills (Sydney)	3 Apr.1978	Lindsey (1979)
Thornleigh (Sydney)	31 Aug.1978	Lindsey (1979)
Bulli Pass (2) (near Wollongong)	27 Dec.1978	Lindsey (1979); I.B.O.C. (1989)
Appin (near Campbelltown)	24 Aug.1980	I.B.O.C. (1989)
Oran Park (western Sydney)	9 Jul.1982	Lindsay (1984)
Oran Park (western Sydney)	19 Jul.1982	Lindsay (1984)
Castle Hill (western Sydney)	11 Aug.1982	Lindsay (1984)
Bushells Lagoon (3) (western Sydney)	13 Mar.1983	Lindsay (1985)
West Ryde (Sydney)	10 Apr.1983	Lindsay (1985)
Cattai (2) (western Sydney)	11 Jun.1983	Lindsay (1985)
Dural (2) (western Sydney)	22 Sep.1983	Lindsay (1985)
Middle Dural (western Sydney)	13 Aug.1985	Cooper (1989)
St. Ives (Sydney)	29 Jan. 1986	Cooper (1990)
Kurmond (3) (north-western Sydney)	26 Feb.1987	A. Morris pers. comm.
Kurmond (north-western Sydney)	Jan.1988	A. Morris pers. comm.
Beecroft (Sydney)	10 Sep.1988	A. Morris pers. comm.
Cattai SRA (north-western Sydney)	21 Nov.1988	A. Morris pers. comm.
Galston (3)	11 Dec.1988	A. Morris pers. comm.
Dural (5) (north-western Sydney)	18 Feb. 1989	A. Morris pers. comm.
Dural (5)	5 Apr.1989	A. Morris pers. comm.
Dural (4) (north-western Sydney)	5 May 1989	A. Morris pers. comm.
Appin (near Campbelltown)	27 Nov.1989	This paper
Dural (2) (north-western Sydney)	17 Feb.1990	A. Morris pers. comm.
Dural (3)	19 Mar. 1990	A. Motris pers. comm.
Dural (5)	3 Jun.1990	A. Morris pers. comm.

BOOK REVIEW

BEGINNERS GUIDE TO AUSTRALIAN BIRDS by Rosemary Balmford, 1990. Published by Penglun Books Australia, Ringwood, Victoria. 268 pages, line drawings by Rhyllis Plant. Price \$15.00 at most booksellers.

I had not read the previous book that Rosemary had written on these lines but it gave me a lot of pleasure to read this volume, even though my beginner's days are somewhat distant. When I read it I realised how privileged beginners are now, both in number of experienced mentors and particularly in having available to them this book. Reading through, you come upon passages the gist of which is something that took you years to learn by trial and error.

It is possibly a misnomer to title the book as a "beginners' guide" as all experienced birdwatchers could benefit from reading it because, despite the level of experience, there is always something for them to find out about birds and this book covers probably every facet of ornithology. The book deals with the selection of optical and camera equipment. The chapter on this is very enlightening for a beginner to decide upon what type of binoculars or camera to buy. Perhaps the author should have suggested that beginners should not indulge in too expensive a set of binoculars at the outset in case they do not go on with the pursuit but I suppose this is a negative attitude which would be foreign to the whole tenor of the book.

In the identification of groups Rosemary Balmford has very succinctly set out methods of classification which must be of tremendous assistance to the new chum in the state of confusion that can ensue in the early days of birdwatching. With some species it is not unknown for this state of confusion to persist through many years of birdwatching. I like her chapter on attraction of birds with the warning of not making them too tame and consequently likely to suffer predation by both humans and cats. The book even deals with the equipment needed for expeditions and holidays and I particularly liked her description of a four wheel drive as being a vehicle which enables you to penetrate further before becoming bogged.

The first part of the book deals in the generalities of birdwatching but in the latter part the author goes on to more advanced pursuits of banding and marking, counting, projects, classifications and some of the more esoteric aspects of ornithology.

One of the most pleasing features of the book is the way each chapter is introduced with a poem relating to birds by Australian poets. The exception is the chapter on expeditions and holidays where a stanza of "Clancy of the Overflow" is most appropriate. Naturally the book has some very minor inaccuracies but it would be curiously to detract from

the book's excellence by listing these. However, the author would get some argument about lyrebirds being found only in mountain forests of the south-east from the residents of Pearl Beach on the New South Wales Central Coast whose native gardens are regularly devastated by the resident lyrebirds.

This is a book not only for beginners but one that all of us should read.

J. Francis.

BOOK REVIEW

AUSTRALIAN WATERBIRDS: A Field Guide, by Richard Kingsford 1991. Published by Kangaroo Press, Kenthurst, NSW, printed in Singapore by Global Com. Pty Ltd. Sponsored by BP Australia. 128 pages, 90 colour photographs, numerous maps and diagrams. \$14.95 from booksellers.

Dr. Kingsford, a research biologist for the NSW NPWS, has produced a compact (1cm thick) paperback which would perhaps be more accurately described as a photographic guide rather than a field guide to waterbirds.

The format is clear and attractive with two birds to a page with a single photo of each on the facing page. The photos are surrounded by pictorial representations of habitat and food and the text is accompanied by a size scale, distribution map, breeding clock and box with differences between males and females.

Its value as a field guide, however, is limited by the single photo of each species and although for the most part these are of the highest quality, I would defy anyone to identify the Black-tailed Godwit from the dark long shot of a group of four. The Bar-tailed Godwit is not in the book and is amongst those specifically excluded in Appendix I as "Species seldom found inland". Also excluded are vagrants such as the Yellow Bittern and Northern Shovler. Appendix II lists organisations and societies, Appendix III, scientific and natural history journals and Appendix IV is a most useful guide to where waterbirds may be seen in Australia, state by state and with distances to the nearest town.

Apart from the limitations imposed by the single photographic illustration of each species, this would be a useful guide for those developing an interest in waterbirds as it gives much information as to how and where to look, equipment and interesting conservation

notes. However, I find the grouping of birds irritating in that, for example, there are 14 pages between Straw-necked Ibis and Sacred and a further 40 pages to the Glossy. Ducks are in three groups with 27 pages between the first two groups and another six pages to the third. Eight pages separate Whiskered Tern from Gull-billed and Caspian, etc, requiring constant reference to the index

The book has little value for long term or experienced bird watchers but could be a worthwhile gift for a beginner.

Barbara Harvey.

NOTICE TO CONTRIBUTORS

Contributors are requested to observe the following points when submitting articles and notes for publication.

1. Species, names, and the order in which they occur are to be in accordance with "Handlist of Birds in New South Wales". A.K. Morris, A.R. McGill and G. Holmes 1981 Dubbo: NSWFOC.
2. Articles or notes should be type written if possible and submitted in duplicate. Double spacing is required.
3. Margins of not less than 25mm width at the left hand side and top, with similar or slightly smaller at the right hand side of pages.
4. No underlinings and no abbreviations except as shown in the examples.
5. Photographs should be glossy finish and not too small.
6. The *Style Manual*, Commonwealth Government Printing Office, Canberra (1966) and subsequent editions will be the guide for this Journal.
7. Diagrams should be on plain white paper drawn with india ink. Any lettering is to be 'professional style' or lightly pencilled.
8. Dates must be written "1 January 1990" except in tables and figures where they may be abbreviated.
9. The 24 hour clock will be used, times being written 06:30, 18:30 for 6:30am and 6:30pm respectively
10. Mr, Mrs, Dr are not to be followed by a full stop.
11. In text, numbers one to ten are spelt; numbers of five figures or more should be grouped in threes and spaced by a thin gap. Commas should not be used as thousands markers.
12. References to other articles should be shown in the text - '...B.W. Finch and M.D. Bruce (1974) stated...' and under heading

REFERENCES

Finch, B.W. and M.D. Bruce 1974 The Status of the Blue Petrel in Australian Waters *Aust. Birds* **9**, 32-35

13. Acknowledgements to other individuals should include Christian names or initials.

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Registered by Australia Post - Publication No. NBH0790

Printed by Drummoyne Printing, 56 Thompson Street, Drummoyne. 811888