

## The Square-tailed Kite *Lophoictinia isura* in Victoria

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### Summary

Victorian records of the Square-tailed Kite *Lophoictinia isura* since 1965 (n=58) were analysed for patterns of seasonal occurrence. There was a clear spring-summer bias, with 24 (41%) of sightings in spring, 27 (47%) in summer, 6 (10%) in autumn and 1 (2%) in winter; there were additional observations of birds behaving conspicuously (soaring high in display, n=10) and breeding (3-4 pairs) in spring-summer. Records show that the species occurs throughout *Eucalyptus*-dominated habitats in the state but is very rare. Breeding was recorded south of 37°S and probably south of 38°S. The species is vulnerable in Victoria, and it is likely that most of the estimated breeding population of <50 pairs occurs on public land that is still subject to severe modification through timber extraction procedures.

### Introduction

Based mainly on records from New South Wales, it was hypothesised that the Square-tailed Kite *Lophoictinia isura* is a breeding migrant to south-eastern Australia (Debus 1983). This hypothesis has been supported by Blakers et al. (1984) who found that from 1977 to 1981 the species was observed more frequently in spring-summer than it was in autumn-winter in both south-eastern and south-western Australia, a pattern that has subsequently been confirmed for Victoria (Emison et al. 1987) in the south-east, and for the south-west (Storr 1986, 1987, Storr & Johnstone 1988, Jaensch 1987). A larger sample size, incorporating new records, enables further analysis to be undertaken for Victoria. This paper reports on the seasonal trends and other data obtained from Victorian records of the species.

### Methods

Records were extracted from the literature (Cowley et al. 1965, Lane 1976, Aston & Balmford 1978, Robinson 1980, Schulz 1983, Burbidge 1985, Horrocks et al. 1987, MacFarlane et al. 1987, Brown et al. 1988, Chesterfield et al. 1988, Henry et al. 1988), the BOCA Unusual Sighting Reports, the Victorian Bird Reports 1981-1985 (Robinson 1982-1984, Drummond 1985, 1987), the RAOU Field and Historical Atlases and Nest Record Scheme, and surveys by CES and colleagues in the National Parks and Wildlife Division over the past 10 years. The analysis includes an observation on the Victoria-New South Wales border that was not included in Debus (1983), and a subsequent one in 1986 (Maher 1988). The same procedure as in Debus (1983) was used in this analysis, i.e. an 'occurrence' means one Kite present at one locality in a given month or part thereof, and nestlings were not counted. Different sources sometimes reported the same occurrence, so care was taken to avoid double-counting. [Note that the records of Bedgood (1960) are excluded on the grounds that they most probably refer to the Black Kite *Milvus migrans*].

Owing to possible seasonal bias in conspicuousness, the few observations of displaying (high-soaring) birds are excluded from the analysis as such behaviour was observed only in spring-summer. The analysis is thus restricted to observations of birds perched or hunting low over the vegetation, or in a few cases (<10% of observations) where no behavioural information was provided.

## Results

### *Seasonal occurrence*

Ignoring the potentially more conspicuous birds in spring ( $n=6$  records) and summer ( $n=4$  records), the seasonal breakdown of Square-tailed Kite records in Victoria since 1965 ( $n=58$ ) is: spring 24 (41%), summer 27 (47%), autumn 6 (10%), winter 1 (2%) (Table 1). The summer results are conservative because several sightings in January-February have been lumped as one record in each month; the number of individual sightings for summer is thus higher than suggested by Table 1. The conspicuous records omitted from the analysis include one, probably two, family parties (pair plus dependent juvenile) in January 1989 (M. Grant/BOCA). In addition to Table 1, there were three Atlas observations of high-soaring birds in spring (no specific dates), a further (undated) spring record (Hollands 1984) and observations of two separate pairs successfully breeding in spring-summer (Hollands 1984, S. Garnett/NRS).

Records in southern New South Wales since 1981 continue the trend in Debus (1983): 25 in spring-summer, 5 in autumn-winter (Lindsey 1984-1986, Cooper 1989, Henle 1989, Whiter 1989, R. Jaensch pers. comm.). Even in northern New South Wales, the Square-tailed Kite was recorded more often in spring-summer (50) than in autumn-winter (14) during 1978-1989 (G. Clancy pers. comm.). There are also records from south-eastern South Australia near Penola in November 1983 (Reid 1984) and at the Coorong in September 1986 (J. Adams, *N.S.W. Field Ornithol. Club Newsl.* 97, 10), and SJSD has observed 1-2 birds in November 1987, November 1988 and October 1989 near Eden and Bombala in south-eastern New South Wales.

In addition to records in Table 1, there is only one non-breeding season record for Victoria (autumn/winter, no specific date) by Hollands (1984) who stated that in his experience all birds leave the nesting area after the breeding season. A similar absence is implied at another Victorian breeding site, where after a successful breeding attempt one summer the birds 'returned' the following spring and unsuccessfully attempted to breed (S. Garnett/BOCA).

**Table 1**  
**Reports of the Square-tailed Kite in Victoria, 1965-1989, by month.**

	<i>Summer</i>			<i>Autumn</i>			<i>Winter</i>			<i>Spring</i>			<i>Total</i>
	<i>D</i>	<i>J</i>	<i>F</i>	<i>M</i>	<i>A</i>	<i>M</i>	<i>J</i>	<i>J</i>	<i>A</i>	<i>S</i>	<i>O</i>	<i>N</i>	
All dated reports:	10	15	6	2	3	1	0	0	1	7	7	16	68
Excluding high soaring birds:	10	12	5	2	3	1	0	0	1	5	7	12	58

### *Distribution and habitat*

Square-tailed Kites were recorded in all the Victorian regions defined in the Victorian Bird Reports. The species has also been recorded since 1965 in 15 (65%) of the 23 physiographic zones defined in Emison et al. (1987), with greatest frequency in the Lower Murray Valley, Mid Murray Valley and East Gippsland Plains regions. There are also clusters of records in the Western, Eastern and Northern Uplands. Thirteen (24%) of the 54 localities reported are coastal. The Square-tailed Kite has been recorded south of 38°S, and breeds south of 37°S (in the Western Uplands and East Gippsland Plains). Observations of pairs soaring high (displaying) or individuals carrying sticks in spring also suggest breeding in the Eastern Uplands, and at 38°S on both the eastern and western coasts of Victoria (Gippsland Plains and Millicent Plains). There are also historical (pre-1950) breeding records for the Western Uplands (per S. Garnett/BOCA).

In Victoria, the Square-tailed Kite has been recorded from a variety of *Eucalyptus*-dominated habitats including tall open-forest, open-forest, woodland and tall shrubland (mallee). Common tree species or associations in these habitats include box-ironbark, peppermints, stringybarks and River Red Gums *Eucalyptus camaldulensis*. One nest was in a Manna Gum *E. viminalis* in Manna Gum-Messmate *E. obliqua* tall open forest (S. Garnett/NRS), and another was in coastal eucalypt forest (Hollands 1984). The species has also been recorded over heath (both semi-arid mallee heath and coastal dune heath) and occasionally over low shrubland and open or cultivated farmland near remnant woodland. Records are commonly associated with watercourses or the margins of wetlands, and some of the forest records are associated with nearby clearings or areas of heath. Most physiographic zones in which the Square-tailed Kite has not been recorded are either extensively cleared, extensive naturally treeless areas, alpine areas, or small southerly forest remnants (including rainforest) isolated by extensive treeless areas (see Emison et al. 1987).

## Discussion

### *Seasonality*

Although the Square-tailed Kite behaves more conspicuously in spring, this alone is insufficient to explain the spring-summer bias in records. If present in winter it should be detectable, as its foraging method requires it to spend much time airborne (e.g. Hollands 1984). The paucity of records in autumn-winter suggests that there must be a genuine seasonal movement into and out of Victoria. It seems likely that most individuals of this species leave Victoria in autumn, which is to be expected in view of similar findings for south-eastern Australia (Debus 1983) and the temperate south-west corner of Western Australia (Storr 1986, 1987, Storr & Johnstone 1988, Jaensch 1987, King 1988, J. Dell pers. comm.).

The need for migration is consistent with the availability of the species' main prey, nestling passerines (e.g. Hollands 1984), and its almost total dependence on aerial foraging methods (Debus & Czechura 1989). The Square-tailed Kite breeds in spring-summer (eggs September-November: Debus & Czechura 1989) in southern Australia, as do most passerines (Beruldsen 1980). It may avoid winter food shortages and the high winter rainfall, which would impair its aerial foraging methods, by moving north to the dry season of the tropics. As few passerines breed in the tropics from May to August (Frith & Davies 1961), it may subsist here on other small prey such as insects, before avoiding the wet season by moving south to the spring of southern Australia.

There is evidence to support these predicted movements, as it has been recorded in the Top End of the Northern Territory only in the dry season (Barnard 1914, Hitchcock & McKean 1969, Crawford 1972, Schodde 1973, Frith & Calaby 1974, Thompson 1977, Barnett 1980, Hertog 1986) and an influx into the Kimberley region, Western Australia, in the dry season has also been reported (McLaren 1988). All 22 Field Atlas records (unusual record forms) from north of 17°S (Cape York, Gulf of Carpentaria, Top End, Kimberley) fall in the dry season. Note, however, that it is recorded year-round from intermediate latitudes in eastern Australia (coastal south-east Queensland), where it appears to be resident (Debus & Czechura 1989) and where seasonal conditions and food supply are presumably more constant (e.g. Nix 1976).

The Square-tailed Kite was formerly considered a rare visitor to the northern half of Victoria (e.g. Wheeler 1967). Recent records indicate that it is a spring-summer breeding migrant, numerically very rare but widespread over most of the state where treed habitats remain, including the coast. [Note that 'very rare' is an abundance category used by CES to describe any species with a density of less than one individual per 100 sq. km of preferred habitat].

### Population

It is difficult to estimate the Victorian population of the Square-tailed Kite with any accuracy. However, the few data available may be used as a guide to at least an order of magnitude. There were two observations of trios (adult pair and juvenile) in the Ballarat and Daylesford areas a week apart in early January 1989 (M. Grant/BOCA); these may have been two different family parties given that fledging occurs in Victoria in December-January and that fledglings stay near the nest for several weeks (Hollands 1984, Debus & Czechura 1989). These sightings were 35-40 km apart. If this figure is used as the inter-nest distance of the Square-tailed Kite in suitable parts of Victoria, it would suggest a density of one pair per 1 200 sq. km of habitat (circle with a maximum radius of 20 km). Some 52 445 sq. km of 'dense forest and woodland' remain on public land in Victoria (LCC 1988). A further 9 206 sq. km of native and non-native forest, woodland, shrubland and mallee remain on private land in Victoria; this figure includes 971 sq. km of softwood plantations (Woodgate & Black 1988). Therefore, excluding the softwood, shrubland and mallee there are less than 61 000 sq. km of potential breeding habitat available to the Square-tailed Kite in Victoria. If this area were saturated with this species at a density of one pair per 1 200 sq. km then there would be sufficient habitat for 50 pairs in Victoria. However, not all apparently suitable habitat is occupied (CES pers. obs.), so it is likely that well below 50 pairs breed in Victoria. As national and state parks occupy approximately 21% of Victorian public land (LCC 1988), it is likely that the habitat of fewer than 10 pairs is currently afforded maximum protection given that other reserves (regional parks, flora & fauna reserves etc.) offer less than maximum protection.

### Conservation

The Square-tailed Kite's specialised feeding ecology requires that it must naturally occur at low density (Debus & Czechura 1989). As half of the eucalypt forest and woodland in eastern Australia has been cleared (Recher 1985) and 70% of that remaining in Victoria is severely modified (Anon. 1987), its classification as 'vulnerable' (as defined by IUCN 1988) in Victoria seems justified. This is especially the case as substantial unreserved areas of public land continue to be severely modified by timber extraction procedures.

The apparent increase in the number of sightings and breeding records for the Square-tailed Kite in southern Victoria most probably reflects an increase in observer numbers, effort and ability (through greater availability of field guides) rather than an increase in the bird's numbers. A decline in its total population, commensurate with the loss of *Eucalyptus*-dominated habitats, is more likely to have occurred. This is regrettable because *Lophoictinia* is a monotypic genus endemic to Australia.

The Square-tailed Kite tends to be faithful to an area (Hollands 1984), and is known to use traditional nest sites (Debus & Czechura 1989). As an interim measure, the known Victorian nest sites and surrounding foraging areas should be protected from disturbance. All other nest sites should be located and protected. Data such as home range size, true population size, fledging success, and sensitivity to forest management practices, should then be collected to ensure the survival of the Square-tailed Kite as a breeding species in Victoria.

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### Note added in proof:

CES did not observe any Square-tailed Kites in central or northern Queensland (Gulf of Carpentaria) in the last week of August 1989, nor from Darwin (N.T.) to Broome (Kimberley, W.A.) in the first two weeks of September 1989. The build-up to the 'wet' in Darwin had started by 2 September. Similarly a colleague, Tom Aumann, obtained 10 sightings of single Square-tailed Kites in the Kimberley between 11 June and 14 August 1989 but no further sightings to late October despite his continued residence there. This supports our hypothesis on Square-tailed Kite movement and wintering areas.