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Editor.

THE BAT GENUS *EPTESICUS* GRAY IN TASMANIA

R. H. Green and J. L. Rainbird
Queen Victoria Museum, Launceston

Introduction

Insectivorous bats of the genus *Eptesicus* (Fam. Vespertilionidae) occur widely and commonly over much of Australia but until recently, only a single species *Eptesicus pumilus* Gray, 1841 was recognised.

McKean *et al.* (1978) summarise their studies which resulted in their defining five *Eptesicus* species based primarily upon differences in the shape of the baculum and supported by differences in skull and body measurements. Subsequently, an examination of 275 *Eptesicus* spp. in the Queen Victoria Museum, Launceston, and 16 in the Tasmanian Museum, Hobart, all collected in Tasmania, revealed that three species were represented as follows: *E. vulturinus* 215; *E. regulus* 26; and *E. sagittula* 50.

Methods

Identification of males was based upon baculum (following McKean *et al.*, 1978) if the penis was present. Males in which the penis had been removed during preparation and females were identified firstly by reference to the shape of the skull as *E. regulus* has a more flattened forehead than *E. vulturinus* and *E. sagittula*, both of which have slightly rounded foreheads (see Figure 1). Secondly, the latter two were easily separable by the significantly small size of *E. vulturinus*, especially in the length of the radius (see Table 1).

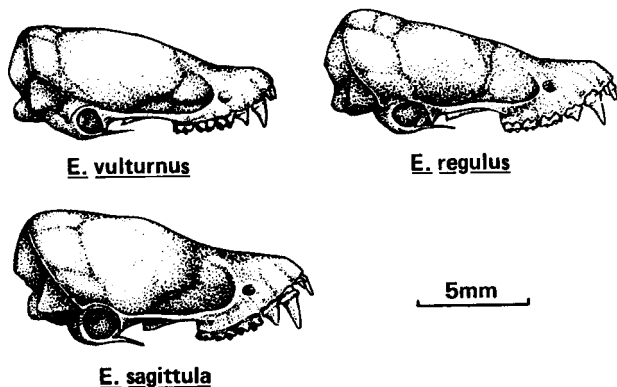


Figure 1

Skull profiles of the three *Eptesicus* spp. found in Tasmania (after Green and Rainbird 1983).

TABLE 1. Comparative radius lengths of *Eptesicus* spp. collected in Tasmania. Animals estimated to be less than 50 days old and unable to fly have been disregarded.

Species	Number of Specimens	Sex	Mean	Range
<i>E. vulturinus</i>	55	♂♂	28.90	(27.20–30.10)
	146	♀♀	30.05	(28.00–31.70)
<i>E. regulus</i>	12	♂♂	32.40	(31.35–33.70)
	10	♀♀	33.30	(31.70–34.35)
<i>E. sagittula</i>	10	♂♂	34.12	(32.00–36.40)
	17	♀♀	35.00	(34.00–36.10)

Results and Discussion

The mean radius length of females slightly exceeds that of males and we found, when like sexes were compared, there was very little overlap in the range of radius lengths of the three species.

Locations from which the three species were collected are plotted on the map (Figure 2). This reflects a bias towards areas of human settlement and a general lack of collecting in unsettled areas.

Eptesicus vulturinus (Little Forest Eptesicus)

Museum collections indicate this to be the most common and widely distributed of the three *Eptesicus* species in Tasmania. Green (1965) gives information on its breeding and other habits following his studies of several maternal colonies in northern Tasmania (before the several species were defined and when all were lumped as *E. pumilus*). Present data tend to suggest that *E. vulturinus* favours low altitude inland areas which support dry sclerophyll forest. It is the only *Eptesicus* spp. yet collected on Flinders Island.

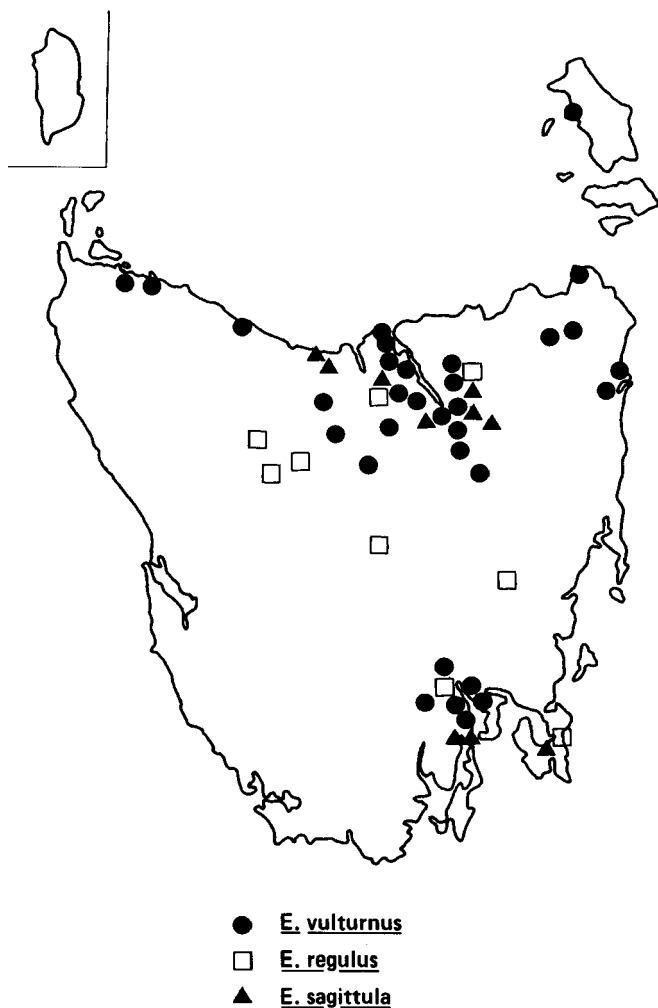


Figure 2

Localities from which the three *Eptesicus* spp. have been collected in Tasmania.

Maternal colonies, composed mainly of pregnant females, are formed in spring (September — October). Most of the sites so far recorded have been in cavities in buildings, the only exception being a colony of six adult males and 60 adult females collected from a cavity in a felled tree at Epping Forest on 14 September 1965.

E. vulturinus gives birth to a single young between late November and mid December during which time fertile males may also occupy the maternal roost for a few weeks. If undisturbed, the young are left in the roost when the adults fly to feed at dusk. The young do not take nocturnal flights until about 50 days old, by which time they are well grown, and their diet changes from milk to insects. The pelage colour during the first year is dark grey but in older bats with well worn teeth the pelage is chocolate brown.

Eptesicus regulus (King River Eptesicus)

This bat appears to favour the highlands and wet forests as most of the specimens collected have been found in or near to such habitats. An exception was a maternal colony collected near Whiteford on 18 January 1980. This was discovered after the felling of an old *Eucalyptus viminalis* in a semi-open dry sclerophyll site. The colony had occupied a cavity in an old ants' nest at a height of about 20 metres. Fifty or more bats were said to have been present and 16 were collected. Adults and juveniles were in about equal numbers, the juveniles being almost fully grown and just able to fly.

The pelage of subadults is a dark brownish grey which changes to chocolate-brown as the bats age. Breeding and pelage colour thus seem to be rather similar to *E. vulturinus*.

Eptesicus sagittula (Large Forest Eptesicus)

Rounsevell (1980) first recorded the occurrence of *E. sagittula* in Tasmania from a specimen collected at Latrobe in October 1979. It has since been collected from several other widely ranging low altitude areas supporting woodland and sclerophyll forest. Rounsevell (1980) also mentions a maternal colony of *E. sagittula* found south-east of Oatlands in January 1980. Subsequent examination of material from this colony revealed it to be *E. regulus*.

On 20 January 1983, during clearing of a house block at Tinderbox, a dead and rotten eucalypt tree was felled inside which was a colony of bats later determined as *E. sagittula*. Thirty-seven, many of which were killed or injured in the fall, were collected and it was estimated by the collector that at least as many again had flown away.

The salvaged animals were sent to the National Parks and Wildlife Service in Hobart and subsequently passed on to the Queen Victoria Museum for baculum extraction, preparation and accession. Further examination showed the series to comprise 8 adult females, 15 juvenile females and 14 juvenile males. Adults were identified by nipple condition (lactating or post lactating) and on tooth wear (after Green 1965) and they ranged in body weight from 5.0 to 6.5g. Juveniles ranged in weight from 3.1 to 5.0g, the lightest (youngest) having body fur of about 2mm long. Using the criteria of Green (1965) for growth rate of young in a colony of *E. vulturinus* (then called *E. pumilus*), the smallest bat in the present colony would have been about two-thirds grown or about 35 days old and too small to fly. Parturition would therefore have been completed by about 20 December, thus closely approximating the breeding season of *E. vulturinus* as given by Green (1965) who found the young of that species to be produced over a period of about three weeks, between the end of November and mid December.

The only other recorded colonies of *E. sagittula* are mentioned by Hall & Richards (1979) and were from the Tumut region in New South Wales. One comprised 18, the other over 60. They comment that the former colony of 18, discovered in early December, consisted entirely of pregnant females with the exception of one which had recently given birth. This also closely approximates the estimated parturition date for the Tasmanian *E. sagittula* colony.

The pelage colour of subadults is dark grey-brown being marginally darker than that of the former two species. In mature adults it is chocolate brown.

The discovery that three species of *Eptesicus* live and breed in Tasmania, sometimes in close proximity to each other, suggests a most interesting and specialised ecological separation.

At present we do not know the specific elements the different species require nor how the three are able to live, sometimes apparently in close association, without conflict. Much detailed study is necessary before this will be revealed. A great need at present is to gain a better knowledge of the distributional range and habitat preferences of each species for, as Figure 2 reveals, only a very small area of the island has so far been sampled. All further records will therefore be valuable.

The discovery of colonies should be reported to a museum or the National Parks and Wildlife Service. Any dead bats which can be salvaged should not be wasted but secured in a plastic bag and forwarded to the nearest authority. They should be frozen if a delay in despatch is inevitable. All such material and relevant data will help in developing an understanding the ecology of these bats, the smallest of our mammals.

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LONGEVITY OF ALBINO MASKED LAPWING

Murray K. Lord

8 Goodhart Place, Sandy Bay

In "The Tasmanian Bird Report" No. 7, there is a report of an albino Masked Lapwing (*Vanellus miles*). That sighting was made by Mr. J.G.K. Harris at Stanley, on 1 December, 1977.

Subsequently on 15 January, 1981 (T.B.R. No. 11) the bird was seen again, this time by Dr. O.M.G. Newman. The location was given as the Wiltshire Junction (Stanley). The Bird Report said, "This bird has been resident in the area for several years now."

Again at Wiltshire Junction, on 10 June, 1983, I saw the bird, at approximately 1000 hours. It was accompanied by a bird of standard plumage. This was in a paddock with cows. At approximately 1530 hours, the bird was still in the paddock, but was not accompanied by another of the species. My sighting was therefore over 5 years 6 months after the original sighting.

The bird's plumage was entirely white; except for the yellow facial mask, black cap and breast bands. The life expectancy of this species is approximately 8-10 years. Considering that the Wiltshire Junction bird is an albino, and that albinos do not usually live as long as birds of standard plumage, this shows how interesting these records are.

SOME NOTES ON THE DUSKY ROBIN (*MELANODRYAS VITTATA*)

Dr. O.M.G. Newman (pers. comm.) reports that there is a lack of information on the nomadism of the Dusky Robin. This information is needed for the text of the R.A.O.U. Field Atlas to be published soon by the Melbourne University Press. The Atlas will summarise the results of the five-year Australia-wide atlasing survey conducted by the R.A.O.U. which commenced 1 January 1977.

In a survey of Mt. Wellington (The Emu 77: 19-22, 1977) I found that the Dusky Robin was most frequent in dry sclerophyll and in areas cleared for the installation of power lines, but it was also occasionally present in wet sclerophyll and, although very rarely, even in the high altitude woodlands between 800-1200m.

In a recent survey of the forested areas of Mt. Wellington (Tasmanian Naturalist No. 74 and Tasmanian Bird Report No. 12) in which the number of visits to the survey zones was much greater than in the earlier survey, I never found the Dusky Robin in wet sclerophyll or in high woodlands. Its only occurrence in the forested areas was in dry sclerophyll, where I saw it during 40% of my visits to that habitat.

In another survey (The Emu 80: 169-170, 1980) I observed the Dusky Robin in dry sclerophyll near Risdon Brook Reservoir and Flagstaff Hill during 76% of my 21 visits there, and in wet sclerophyll, wet scrub and sedgeland at Snug Plains during 42% of my 19 visits there. Because of frequent fires at Snug Plains, the wet sclerophyll did not have a dense understorey, and it was possible to walk readily through it. In yet another survey during the aftermath of a bushfire on Mt. Nelson (Tasmanian Naturalist No. 57, May 1979, pp. 12-18), I found the Dusky Robin on four occasions in the burnt area on the eastern-facing slope, and not at all in the unburnt areas.

The various surveys thus appear to indicate that this Tasmanian nomadic species is capable of occupying a wide range of habitats, the nature of which may change with the condition of the understorey as a result of fire. The species seems to prefer a lightly forested habitat such as is provided by dry sclerophyll. In the aftermath of bushfires which remove the formerly dense understorey, the species is also found in wet sclerophyll. It is sometimes seen in high altitude woodlands and has also been reported in subalpine forests (D.G. Thomas, Tasmanian Bird Atlas, University of Tasmania) as well as in coastal heaths and sedgelands.

A.V. Ratkowsky

HOW MANY BIRDS ARE THERE IN YOUR GARDEN?

It is surprising how many birds can be seen in suburban gardens, far from bush. During the 18 month period January 1981 — June 1982, the following species were seen amongst the trees and shrubs of the small garden at the back of our house at 117 York Street, Dynnyrne: Spotted Turtle-Dove, Swift Parrot, Eastern Rosella, Shining Bronze-Cuckoo, Blackbird, Yellow Wattlebird, Little Wattlebird, Crescent Honeyeater, New Holland Honeyeater, Eastern Spinebill, Silvereye, European Goldfinch, European Greenfinch, House sparrow and Common Starling.

In addition, the Silver Gull and the Yellow-tailed Black Cockatoo were seen flying over the garden, and the Masked Lapwing, Laughing Kookaburra, Grey Butcherbird and Australian Magpie were heard from the garden. The nearest bushland is Tolmans Hill, which is approximately 700m from the house and therefore well outside hearing range from the garden.

A.V. Ratkowsky

ABORIGINAL INFLUENCES ON VEGETATION IN THE NORTHEAST HIGHLANDS

R.C. Ellis

Division of Forest Research, CSIRO, Hobart.

In Tasmania, man has used fire as a tool for more than 23,000 years, and carbon dating of cave, stream and slope deposits of charcoal indicate that man-made fire has probably been a major factor affecting the vegetation during at least the last 6,000 years (Macphail 1980). Writing in 1829-1834, Robinson described how aborigines at that time used fire consistently for hunting and for keeping their travel routes and camping areas free of undergrowth (Plomley 1966). Fifty years after the removal of aborigines from most of the state, Walker (1897) wrote, "Many open plains, especially in the north, which were formerly known as favourite resorts of the blacks subsequently became overgrown with forest through the discontinuance of these annual burnings." The patches of open country that served as communication routes "were formerly more numerous, being kept clear by burning. Many of them have become overgrown with timber since the removal of the natives."

A good example of the effect that aborigines had upon the vegetation is to be found on the Mt. Maurice Plateau. This is an area of about 7,000 ha encompassed by Mt. Maurice, Mt. Scott, Ben Nevis and Mathinna Plains in the northeast highlands.

The Ben Lomond Tribe occupied the valley of the South Esk River and was known to have travelled via lightly timbered country from the river valley to the high plateau of Ben Lomond. Presumably it would also have traversed the contiguous open country of Roses Tier, north of Ben Lomond and reached the Mt. Maurice Plateau via the high, narrow interfluvium between the North Esk and South Esk Rivers. Densely wooded valleys to the north and east would have made access difficult to other tribes. Access was easier from the western valleys, such as the North Esk, which were occupied by the Port Dalrymple Tribe, and the highlands may also have been used by this tribe with which, however, the Ben Lomond Tribe appeared to have little contact, since they differed in language (Walker 1897).

The present climate of the Mt. Maurice Plateau would allow rainforest to dominate the whole area, and that it does not is almost certainly attributable to aboriginal burning practices. The present distribution of forest types provides evidence that these practices could have operated in two ways, i.e. by restricting the expansion of rainforest throughout the post glacial period and ensuring the perpetration of the early post glacial eucalypt/grass vegetation, and by destroying existing rainforest to allow its replacement by grass, with or without eucalypts.

In a broad fan that extends from the North Esk-South Esk interfluvium east to Paradise Plains, north to the south side of Mt. Maurice, and west along Ben Ridge to Diddie Plains, the distribution of eucalypts and mature rainforest is consistently correlated with topographic position. Eucalypts (a Tasmanian variety of *E. delegatensis*) occupy all convex and level topography whilst old rainforest is restricted to the lower slopes and riparian zones of the numerous shallow valleys. Until settlement, the eucalypt/rainforest boundaries appear to have been stable. Within this area, the eucalypts are invariably forest grown in form (tall, straight, and relatively closely spaced) and treeless patches occur only on wetlands dominated by button-grass. Such a regular pattern was almost certainly climatically determined, but it is appropriate to a drier climate rather than that considered to have occurred on the Plateau for some millenia. It is most likely to have been perpetuated by frequent and systematic burning off of the eucalypt stands during some thousands of years. Tree ring counts show that a dramatic expansion of rainforest as understorey to the eucalypts has occurred since early last century, when burning by aborigines ceased. The rapid development of rainforest understoreys has

been accompanied by an equally dramatic decline and death of the eucalypt overstoreys, with eucalypts of all ages usually dead by the time their understoreys are 60 to 120 years old.

Outside this eucalypt/rainforest mosaic, extensive areas of primaeval rainforest that occupy all topographic positions occur to the east near Paradise Plains, north and west of Mt. Maurice to Mt. Scott, and to the west around Diddleum Plains. If these rainforest areas once supported eucalypts all trace of them has long since disappeared. Paradise Plains and Diddleum Plains are areas of grassland (dominated by snow grass). They contain charred remains of myrtle and celery-top pine logs, which indicates that both plains were formed by the destruction of rainforest by fire.

From the absence in part, or state of decay of rainforest logs, and from the age of the oldest pioneer eucalypts it is apparent that initial formation of the plains occurred at least 200 years ago, and probably much earlier. It is also apparent that a relatively large area of rainforest was destroyed at any one time. Between destructive events the rainforest/grassland boundary appears to have been stable. The distribution of open plain and adjacent closed rainforest is unrelated to topography: grass and rainforest remnants occur side by side in the valley bottoms whilst individuals and groups of myrtle survive on convex grassed slopes.

The area of primaeval rainforest has been reduced since settlement, on Paradise Plains by fires associated with tin mining early this century, and on Diddleum Plains by early attempts to clear the rainforest for farming. However, until eucalypt logging commenced in the 1950's, most of the Maurice Plateau had remained relatively undisturbed for 100 years, and much of it is still undisturbed. As a result the area of closed rainforest (most of it less than 150 years old) is considerably greater now than it was at the time of settlement, and the area is still expanding. In the same time the area occupied by healthy eucalypt forest has considerably diminished. The aborigines were evidently able to maintain a dry-sclerophyll forest type as a relict in a rainforest environment, and may have even extended the eucalypt forest by burning the rainforest. Now the forest types are changing to adjust to the climate. In the continued absence of fire, rainforest will probably expand to occupy the whole area.

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