

## The occurrence of owls in the Marshall Islands

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**Abstract** Short-eared owls (*Asio flammeus*) are capable of crossing long stretches of open water and have been successful colonisers of islands. In the central and western Pacific two established populations (on Hawai'i and on Pohnpei in Micronesia) seem to be the foci of repeated dispersal events. The paper reviews the historic and linguistic record for the occurrence of short-eared owls on the scattered atolls of the Marshall Islands, the easternmost group of Micronesia.

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### INTRODUCTION

Island biogeography and the assessment of the dispersal of avian species (Diamond 1974) relies on reports of both successful and unsuccessful dispersal events. The latter are not easy to ascertain unless a bird has been observed or caught. Archival documents and older narratives often contain previously unrecognised observations of the presence of bird species (Spennemann 1998). Unfortunately such sources often suffer from a lack of detail thus not allowing the sighting to be attributed to a particular species level. On occasion, however, the data are detailed enough for valid conclusions to be drawn.

There are very few raptors in the central and western Pacific Islands (Hawai'i and Micronesia, including Kiribati and Tuvalu), and, of these, owls are the most common. The aim of this note is to collate evidence for the occurrence of owls on the Marshall Islands drawing on modern observations, hitherto overlooked historic sources, and linguistic data.

### OWLS IN MICRONESIA

There are only two owl species native to the central and western Pacific: the Palau owl (*Otus podarginus*) and the short-eared owl (*Asio flammeus*). The first is endemic to Palau (Baker 1951: 215; Pratt *et al.* 1987: 215) and the second has dispersed more widely. Barn owls (*Tyto alba*) were introduced to Hawai'i in 1958 (Beckon 1989; Pratt *et al.* 1987:215).

Short-eared owls, widespread in the northern hemisphere (Mikkola 1992), are vagrant to the more tropical climates of south-east Asia (MacKinnon & Phillipps 1993: 196). They are present as an endemic subspecies (*A. f. ponapensis*) on Pohnpei (6°50'N, 158°15'E) (Baker 1951: 218, disputed by Engbring *et al.* 1990: 119) and as native (*A. f. ponapensis* or *A. f.*

*flammeus*) in the southern Marianas on Saipan ((15°15'N, 145°44'E), Tinian (14°59'N, 145°33'E), and Pagan (18°04'N, 145°41'E) (Prowazek 1913: 80; Baker 1951: 217). On Guam (13°30'N, 144°50'E) they are now deemed rare migrants (Jenkins 1983: 59). As vagrants or migrants, they have been recorded on Yap (9°37'N, 138°08'E) (Pyle & Engbring 1985; Pratt *et al.* 1987: 216), Kosrae (5°19'N, 163°06'E) (Baker 1951: 219; Pratt *et al.* 1987: 216) but not yet on Chuuk (Engbring 1984). They have also been noted on the isolated north-western Hawaiian atolls of Kure (28°25'N, 178°28'W) and Midway (28°12'N, 177°22'W) (Pratt *et al.* 1987: 216).

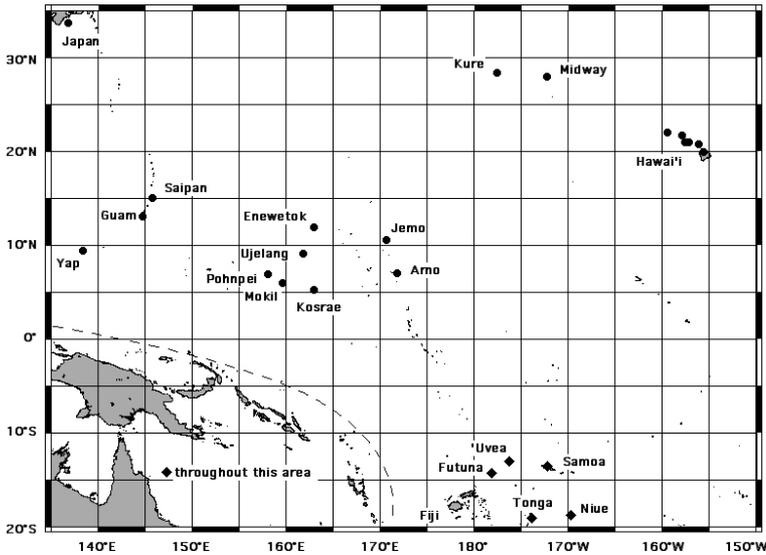
Further east they were introduced to and now are established on various islands of Hawaii (Pratt *et al.* 1987: 216)(Fig. 1). The subspecies of the short-eared owl on Pohnpei is regarded as endangered by the U.S. Fish and Wildlife Service (Pratt *et al.* 1987: 38) and as rare by the ICBP (Pratt *et al.* 1987: 38).

Short-eared owls are well known for their ability to cross large stretches of open water and to colonise new areas (Fuentes *et al.* 1993; Nielsen 1997). The distribution map (Fig. 1) shows two clusters of short-eared owls, one centred on Pohnpei and one emanating from Hawai'i. The island world in between, i.e. Marshalls Islands (reviewed below) as well as Kiribati or the Line Islands to the south of Hawaii, are devoid of owls.

Other owls are known from Melanesia and western Polynesia, such as barn owls, grass owls (*Tyto capensis*) and, possibly, another species of tytonid owl in Fiji. None is present further north in the Pacific Islands, except for the introduced barn owl on Hawai'i.

### THE MARSHALL ISLANDS

The Marshall Islands comprise 29 atolls and five islands located in the northern central Pacific Ocean. Aligned in two chains (Fig. 2), each atoll comprises a number of small low-lying sand islets



**Figure 1** Distribution of short-eared owls (*Asio flammeus*) (◆) and common barn owls (*Tyto alba*) (●) in the Pacific.

on the reef platform. The size of these atolls and islands ranges from Kwajalein, with 2174 km<sup>2</sup> enclosed lagoon area (but only 16.4 km<sup>2</sup> combined land mass on 93 islets) the world's largest atoll, to Jemo Island with only 0.16 km<sup>2</sup> landmass. The average size of these islets is less than 2 ha. The largest atolls can reach up to 2.5 km in length and 1.5 km in width. By comparison, Pohnpei Island in the Caroline Islands (FSM) has a land mass of 456 km<sup>2</sup> and Oahu, Hawaii, a landmass of 1573 km<sup>2</sup>.

Traditionally, the larger islets were the foci for human settlement and were heavily cultivated except for the ocean shore areas. Breadfruit (*Artocarpus altilis*) forests would have predominated, with a number of swamp taro (*Cyrtosperma chamissonis*) pits in the centre of the islets. The smaller islets, too small to support a groundwater lens, were not commonly inhabited permanently. Their interior would have comprised a littoral forest of *Pisonia grandis*, *Hernandia sonora*, *Barringtonia* sp. and other tree species (Fosberg 1990; Hathaway 1953; Spennemann 1992). Since the German colonial period (1886-1914), increasing areas of breadfruit and other forests were removed to make way for the more open coconut (*Cocos nucifera*) plantations, which tend to have a grassy or low shrub understory (Spennemann 1992).

On Hawai'i, Pohnpei and the Marianas Islands, short-eared owls inhabit open grasslands. This habitat, however, is essentially non-existent in the Marshall Islands. The main diet of the short-eared owl, rodents, occur throughout the Marshall Islands, especially the small and light-weight Polynesian rat (*Rattus exulans*) (Spennemann 1997); data from U.S.A. and northern Europe have shown

that, in the absence or shortage of rodents, short-eared owls may also feed on chicks and small species of shorebirds (Holt 1994; Sudmann *et al.* 1994; Nielsen 1997; Stienen & Brenninkmeijer 1997), all of which are available in abundance.

### Observations

The presence of owls in the Marshall Islands is not listed in Baker's (1951) treatise on the avifauna of Micronesia nor in Amerson's (1969) seminal work on the birds of the Marshall Islands and Kiribati. Other bird surveys also failed to report them: Enewetak (Pearson & Knudsen 1967; Carpenter *et al.* 1968; Hailman 1979); Ujelang (Anderson 1981); Ebon (Spennemann and Benjamin 1992); Jaluit (Finsch 1880a, 1880b; Schnee 1904); Kwajalein (Schipper 1985; Clapp 1988); the northern Marshall Islands (Fosberg 1966; Thomas 1989); and Wake Atoll (Porter 1953; Bryan 1959; Casey 1966; Fosberg 1966). This indicates the overall rarity of these birds in the Marshall Islands.

There are three isolated records related to the occurrence of owls in the Marshall Islands which can be drawn on:

Enewetak Atoll (11°30'N, 162°20'E, 40 islets, combined landmass 5.85 km<sup>2</sup>); in July 1973 Johnson & Kienholz (1975) collected a single female short-eared owl as a vagrant on Fred Islet, on Enewetak Atoll (Fig. 2). As Berger (1987) points out, the origin (Asia, Pohnpei, Hawai'i) of that specimen is unclear.

Arno Atoll (7°10'N, 171°40'E, 83 islets, combined landmass 13 km<sup>2</sup>); the German Catholic priest Albert Neumann, resident on Ine, Arno Atoll (Fig. 2), and fond of hunting, was called in mid-1908 to investigate a bird unknown to the

Marshallese which was reputedly becoming continuously bigger and was feared to eventually attack and eat people. Upon investigation the bird turned out to be a 'true, German forest owl' ('echte deutsche Waldeule'; Neumann 1908). To rid the Marshallese of their fear Neumann shot the bird. The specimen was apparently not collected. It is extremely unlikely that the German priest would have been mistaken in his identification of the bird. His description of the bird as a German 'Waldeule' (long-eared owl, [*Asio otus*]) indicates an owl with ears. In the setting of Micronesia the description suggests a short-eared owl.

Jemo Island (10°07'N, 169°33'E, one island, landmass 0.2 km<sup>2</sup>); Fosberg (1966) reported finding what he regarded as an owl pellet on Jemo Island (Fig. 2) in December 1951. Amerson (1969: 333) mentioned this report but could not give it much credence in the absence of confirmed sightings. The evidence provided by the pellet is circumstantial as other birds common to the area, such as egrets, are known to produce pellets.

### Linguistic data

A brief analysis of linguistic data shows that owls were never permanently present in the Marshall Islands, and as vagrants were so rare that they warranted no special term. Although the modern Marshallese language reputedly has a term for male (*mao*) and female (*lijemao*) owls (Abo *et al.* 1976: 178, 213), the bird is not contained in the early word lists (Hernsheim 1880; Senfft 1900; Grösser 1902), not even in the otherwise very comprehensive and authoritative dictionary compiled by Pater Augustin Erdland (1906). It is also worth noting that Erdland (1906: 147) lists *lijemao* as a petrel. The modern nomenclatory identification appears rather doubtful as male and female short-eared owls are not readily distinguishable by their plumage and any gender differentiation in Marshallese nomenclature only occurred for birds deemed significant for dietary or other cultural reasons.

Krämer & Nevermann (1938: 295), compiling the known bird species and their names, mention that owls are very rare and give the Marshallese terms *djedjak* and *drak* for the birds. However, this is most probably a compilation or typesetting error ('Eule' [owl] instead of 'Ente' [duck]), drawing on Erdland's (1906: 18) generic terms for ducks (*djedjak* and *drak*).

On Kosrae, owls are known by the English loan word *ohwel* (Lee 1976: 90), again suggesting rarity. Local names, however, exist for Pohnpei, where the short-eared owl is established (*likoht, tehap*; Rehg & Sohl 1979: 50, 113) and for nearby Mokil Atoll (6°39'N 159°53'E) (*seaip*; Harrison & Albert 1977: 81).

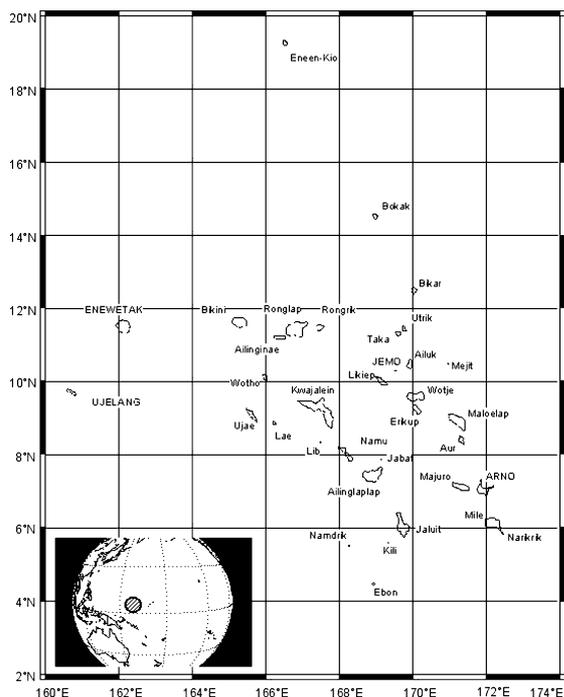


Figure 2 Map of the Marshall Islands with the locations mentioned in the text shown in CAPITALS.

### Conclusions

Short-eared owls have been noted as migrants and vagrants from Asia on various isolated islands and atolls in the northern central Pacific Ocean, and have established themselves on Pohnpei and, after their introduction to Hawaii, on some of the outlying Hawaiian Islands. The distribution map of sightings and other evidence in the Marshall Islands, suggests that Pohnpei, via Kosrae, is a dispersal centre from which various colonisation attempts moved eastwards. The record of a probable *Asio flammeus* for Arno Atoll is the most south-easterly record in the Pacific Ocean area. Coupled with a positive record in hand for Enewetok Atoll and Fosberg's observation of a possible owl pellet on Jemo Island, these demonstrate the migration capabilities of the species. Dispersal with the wind from Hawaii cannot be ruled out, but the open-water distances are much more substantial. This cannot be answered definitively until DNA studies have been carried out. The owl's ability to find very small specks of land is suggestive of their colonising potential.

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