

## Migrant Land Birds and Water Birds in the Mariana Islands<sup>1</sup>

D. W. STINSON,<sup>2,3</sup> GARY J. WILES,<sup>4</sup> AND J. D. REICHEL<sup>2,5</sup>

**ABSTRACT:** Approximately 56 species of land and freshwater birds have been recorded as migrants or vagrants in the Mariana Islands, but few occur in substantial numbers. Common migrants include the Tufted Duck (*Aythya fuligula*), Northern Pintail (*Anas acuta*), and Cattle Egret (*Bubulcus ibis*). Several other heron and duck species appear most years in small numbers. The Barn Swallow (*Hirundo rustica*) is the only regular migrant land bird. A similar assemblage of herons and waterfowl has been reported from the Ogasawara and Iwo Islands to the north. Many more species of migrant land birds occur in the Ogasawara and Iwo groups and in Palau to the southwest, which are closer to large land masses.

A VARIETY OF MIGRANT shorebirds, waterfowl, and ardeids is recorded annually in modest numbers in the Marianas, but migrant land birds are rare. Unlike the Northwest Atlantic where large numbers of passerines make flights over the ocean, only shorebirds appear to use an oceanic route over the Pacific (Williams and Williams 1988, Williams and Mao 1990). The number and routes of regular migrants are of international interest for the purposes of conservation, and rare records on oceanic islands are important because of their potential for explaining the origins and distribution of endemic island fauna. This information is more interesting because of recent subfossil discoveries that indicate today's avian assemblage may represent less than half of the avian community before human-related extinctions (Steadman 1989, 1992, Steadman and Intoh 1994). Vagrant flocks are presumably the source of colonizers that produced the current and past endemic bird fauna of oceanic islands. Rare events that resulted in colonizations without subsequent genetic input from the source population probably allowed the differen-

tiation of island endemics. Baker (1951) believed that certain resident land birds arrived in Micronesia from the Palearctic by way of the Ogasawara (Bonin), Iwo (Volcano), and Mariana Islands.

Several waterfowl and ardeid species annually appear as migrants or winter in the Marianas, and many additional species have occurred as rare visitors. Kuroda (1961) summarized over-sea crossings of land and water birds in the western Pacific and concluded that the Ogasawara and Iwo Islands seem to be the southern limit of most land bird migrants and herons.

We summarize records of migrant and vagrant land and water birds, including ardeids, waterfowl, larids (gulls and terns associated with freshwater), raptors, and passerines from the Marianas. We compare these results with lists of migrants reported for the Ogasawara, Iwo, Yap, and Palau Islands and reassess the conclusions of Kuroda (1961). A detailed summary of shorebird occurrence is presented in Stinson et al. (1997).

### MATERIALS AND METHODS

#### *Study Area*

The Mariana Islands include 15 islands forming an archipelago from 13° 13' to 20° 31' N (Figure 1). Guam, the largest, is 541 km<sup>2</sup>. The remaining 14 islands, totaling 478 km<sup>2</sup>, range in size from 1 km<sup>2</sup> (Farallón de Medinilla) to 120 km<sup>2</sup> (Saipan) (Stanley 1989). The southern-

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<sup>2</sup> Division of Fish and Wildlife, CNMI Government, Saipan, Mariana Islands 96950.

<sup>3</sup> Current address: 12106 SE 314th Place, Auburn, Washington 98092.

<sup>4</sup> Division of Aquatic and Wildlife Resources, P.O. Box 2950, Agana, Guam 96910.

<sup>5</sup> Current address: Montana Natural Heritage Program, 1515 East 6th Avenue, Helena, Montana 59620.

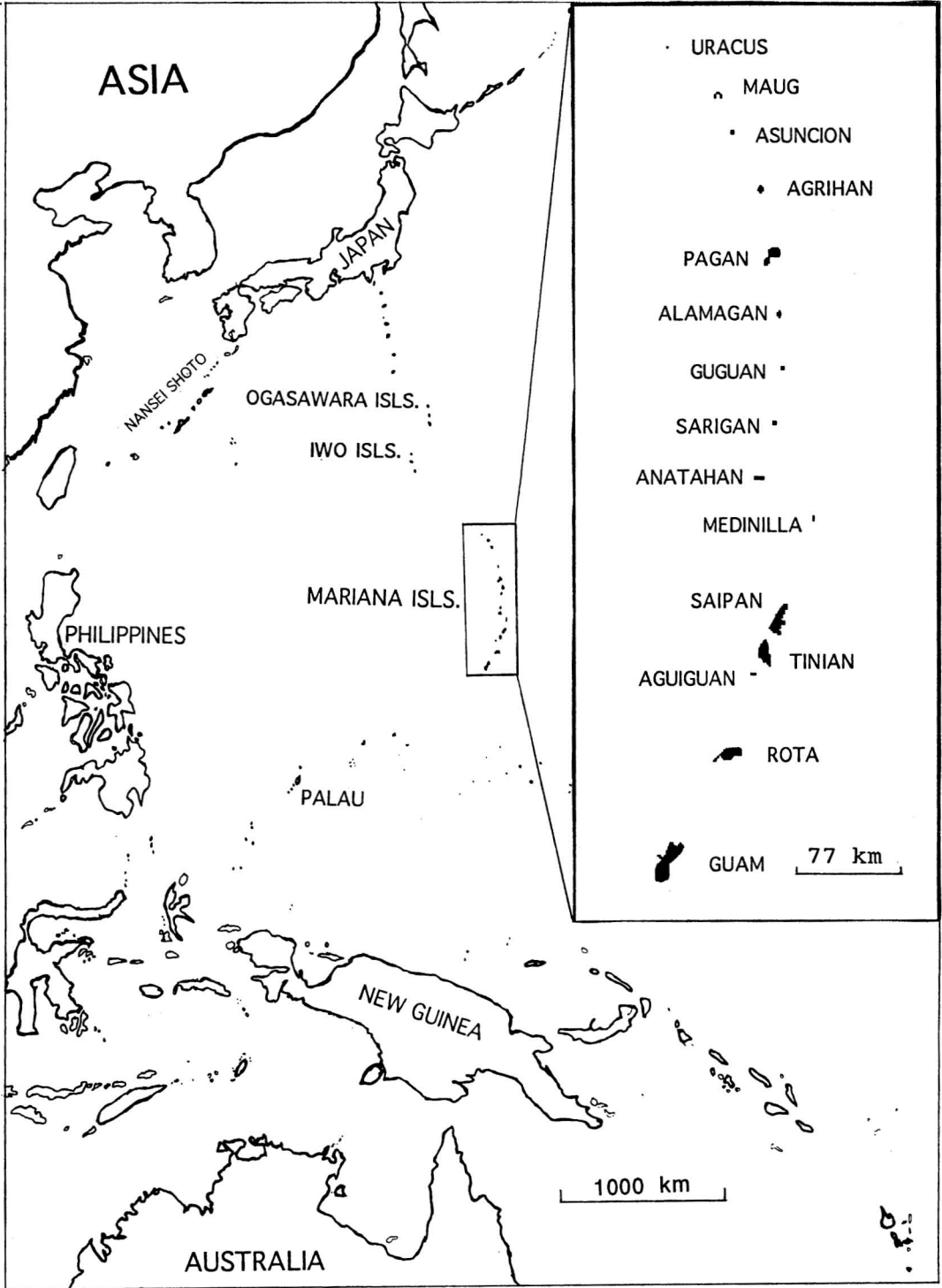


FIGURE 1. The Mariana Islands and their location in the western Pacific.

most six islands are uplifted coral limestone on an ancient volcanic core. The remaining nine are of more recent volcanic origin. Substantial wetland habitats used by migrant waterfowl and herons in the Marianas (excluding small streams) are found only on the islands of Guam, Saipan, Tinian, and Pagan (Stinson 1993, Wiles and Ritter 1993).

The 27 Ogasawara Islands (total area = 104 km<sup>2</sup>) and the three Iwo Islands (31.5 km<sup>2</sup>) are small volcanic islands. Minami-iwo, the closest of the Japanese islands, is approximately 575 km NW of Uracus and 1150 km S of Honshu. The main Yap islands (total area 118 km<sup>2</sup>) are 870 km SW of Guam. Babeldoab, the largest of the Palau Islands (total area 488 km<sup>2</sup>), is 1265 km to the WSW of Guam. Palau is approximately equidistant (875 km) from Mindanao, the Philippines, and New Guinea.

Bird records for the Marianas were compiled from recent sighting records on file at the CNMI Division of Fish and Wildlife (DFW) that date back to 1982, and the Guam Division of Aquatic and Wildlife Resources (GDAWR), and published literature. Most of the sightings reported here were obtained during surveys of wetland and shore sites or incidental to other activities in uplands. Wetland birds move frequently between several wetland sites, so often only a portion of the birds present is detected. Most of our observations are from Saipan and Guam. For each species, we typically have monthly data from Saipan for a subset of the years 1987–1993. We used the maximum number recorded for each month and averaged these maxima for the years we have data, and present these monthly maxima for the most common species. We use the term common for annual visitors when >10 individuals are nearly always recorded on Saipan or Guam, and uncommon when they are less consistently recorded and usually < 10 in number. Rare species are those that are recorded in very small numbers (typically <5, more often one or two) and there is a ≥50% chance that they will be recorded during a year. Very rare species have a <50% chance of being recorded during a year in very small numbers. Species order and nomenclature follows that used by the American Ornithologists' Union (1983), Pratt et al. (1987), and Reichel and Glass (1991). We compare our migrant list with lists for Palau (Engbring 1988)

and for the Iwo and Ogasawara Islands (Kuroda 1961, Brazil 1991).

## RESULTS

Fifty-six species of land and freshwater birds have been recorded, but only 27 have been recorded five or more times, and only 10–12 of these are regular migrants. The Ogasawara and Iwo Islands together have been visited by a much greater number of migrant land birds (59) than the Marianas (19), but a similar number of ardeids (13 versus 10) and anatids (16 versus 15) (Figure 2). Only the shorebirds are represented by a greater number of species in the Marianas and Palau than in the Ogasawara and Iwo groups, perhaps reflecting the amount of available intertidal and freshwater habitat. Species considered to be accidentals or very rare visitors with <5 records (except the Mallard, *Anas platyrhynchos*) are listed in Table 1, but not discussed. Species that have been recorded ≥5 times (usually in three or more years) and the Mallard are discussed below.

### Species Accounts: Waterbirds

GRAY HERON (*Ardea cinerea*). The Gray Heron is a very rare vagrant with three records from Saipan, one from Guam, and a probable sighting on Rota (Glass et al. 1990, Wiles et al. 1993; D.W.S., unpubl. data). The earliest autumn record is 3 November, and the latest in spring was 26 April. One or two birds have been seen at Lake Susupe, coastal flats, and at aquaculture

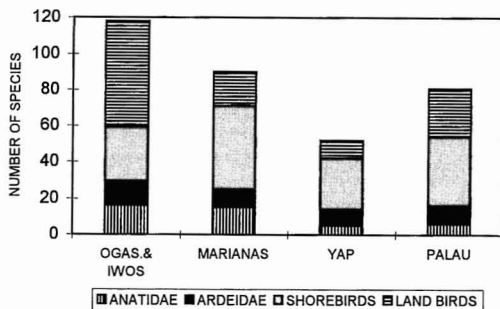


FIGURE 2. Number of migrant Anatidae, Ardeidae, shorebirds, and land birds recorded in the Marianas, Yap, Palau, and the Iwo and Ogasawara Island groups.

TABLE 1  
 VERY RARE AND ACCIDENTAL RECORDS OF WATERBIRDS AND LAND BIRDS IN THE MARIANAS

SPECIES	ISLAND AND DATES <sup>a</sup>	REFERENCES <sup>b</sup>
<b>Waterbirds</b>		
Great Cormorant ( <i>Phalacrocorax carbo</i> )	P: Nov. 1987	1
Little Pied Cormorant ( <i>Phalacrocorax melanoleucos</i> )	P: Nov. 1987; S: Dec. 1989	1;2
Black Bittern ( <i>Ixobrychus flavicollis</i> )	G: Jan. 1900 <sup>c</sup>	6
Chinese Pond Heron ( <i>Ardeola bacchus</i> )	G: Feb.–Apr. 1987	4
Rufous Night-Heron ( <i>Nycticorax caledonicus</i> )	P: Aug. 1979, Nov. 1987	1
Tundra Swan ( <i>Cygnus columbianus bewickii</i> )	R: Nov. 1989 <sup>c</sup>	2
Falcatel Teal ( <i>Anas falcata</i> )	S: Oct. 1985	1
Spotbilled Duck ( <i>Anas poecilorynchus</i> )	G: Jan.–Feb. 1986; S: Nov. 1992	5;3
American Wigeon ( <i>Anas americana</i> )	G: Feb. 1981, Jan. 1986	5
Common Pochard ( <i>Aythya ferina</i> )	G: Feb.–Mar. 1981; S: Nov.–Dec. 1989, Jan. 1993	7;2
Greater Scaup ( <i>Aythya marila</i> )	S: Dec. 1987, Jan., Dec. 1988, Dec. 1989	1,15
Red-breasted Merganser ( <i>Mergus serrator</i> )	T: Aug. 1990 <sup>c</sup>	2
Eurasian Coot ( <i>Fulica atra</i> )	G: autumn 1895; T: (no date); S: Jan. 1993	8;9;3
Laughing Gull ( <i>Larus atricilla</i> )	S: Apr. 1990 <sup>c</sup>	2
Herring Gull ( <i>Larus argentatus</i> )	M: (carcass) 1984 <sup>c</sup>	1,11
Slaty-backed Gull ( <i>Larus schistisagus</i> )	G: Jan. 1992 <sup>c</sup>	4
Gull-billed Tern ( <i>Sterna nilotica</i> )	G: Nov. 1991	4
<b>Land Birds</b>		
Black Kite ( <i>Milvus migrans</i> )	P: Feb. 1984; T: Nov. 1990; G: Dec. 1994–Apr. 1995	1;2;13
Japanese Sparrowhawk ( <i>Accipiter gularis</i> )	G: 1901 <sup>c</sup>	6
Gray-faced Buzzard ( <i>Butastur indicus</i> )	G: Mar. 1995	13
<i>Buteo</i> spp.	G: Oct. 1987	4
Eurasian Kestrel ( <i>Falco tinnunculus</i> )	S: Oct. 1981 <sup>c</sup> , Dec. 1987; G: Sept. 1994	1;13
Amur Red-footed Falcon ( <i>Falco amurensis</i> )	S: Oct. 1986; Sr: Sept. 1990	1;2
Peregrine Falcon ( <i>Falco peregrinus</i> )	G: July, Nov. 1945; S: Feb. 1990	12;4
Eurasian Hoopoe ( <i>Upupa epops</i> )	S: Aug. 1988	2
Common Kingfisher ( <i>Alcedo atthis</i> )	G: Sept.–Oct. 1987	4
Dusky Thrush ( <i>Turdus naumanni</i> )	M: Feb. 1984 <sup>c</sup> ; U: 1984	1;1
Yellow Wagtail ( <i>Motacilla flava</i> )	G: Sept.–Oct. 1993, Sept. 1994	13
Gray Wagtail ( <i>Motacilla cinerea</i> )	G: Mar. 1981	7
Black-backed Wagtail ( <i>Motacilla lugens</i> )	S: Jan. 1991	3
White-cheeked Starling ( <i>Sterna cineraceus</i> )	S: (no date) <sup>c</sup>	9

<sup>a</sup> G, Guam; R, Rota; T, Tinian; S, Saipan; Sr, Sarigan; P, Pagan; M, Maug; U, Uracus.

<sup>b</sup> 1, Glass et al. (1990); 2, Stinson et al. (1991); 3, Stinson et al. (1995); 4, Wiles et al. (1993); 5, Wiles et al. (1987); 6, Seale (1901), 7, Maben and Wiles (1981); 8, Hartert (1898); 9, Hachisuka et al. (1932); 10, Drahos (1977); 11, Reichel and Glass (1991); 12, Baker (1951); 13, G.J.W., unpubl. data; 14, Reichel et al. (1994); 15, DFW files.

<sup>c</sup> Specimen collected.

ponds. This species is a locally common resident and partial migrant in Japan with records from the Ogasawara and Iwo Islands (Kuroda 1961, Brazil 1991). Beehler et al. (1986) did not list Gray Herons for New Guinea, but H. D. Pratt (pers. comm.) has recorded this species on Palau and Yap.

**GREAT EGRET** (*Ardea alba*). The Great Egret is a very rare migrant and winter visitor most often seen in the winter months, but with records

in all months from October to March (Glass et al. 1990, Wiles et al. 1993, Stinson et al. 1995). Up to four birds have been seen at coastal mudflats, small ponds, mown lawns, and Lake Susupe. This species was not recorded until 1987, but it has been seen annually since 1992. Band returns indicate that this species migrates from Japan and Korea to the Philippines and from Australia to New Guinea (McClure 1974). It is an uncommon breeder and winter visitor to Japan and has been recorded in the Ogasawara

Islands (Brazil 1991), and Yap (H. D. Pratt, pers. comm.). The breeding range of this species also includes most of the Australasian region, including New Guinea and the Philippines (Hancock and Kushlan 1984).

**INTERMEDIATE EGRET (*Mesophoyx intermedia*).** This is a rare migrant and winter visitor in the Marianas. Birds have occurred on Saipan and Guam in almost all recent years, being recorded in all months from late September to early May. Baker (1951) documented birds summering on Guam in 1945 and 1946, but there is only one record of this in recent years. Intermediate Egrets are also reported from Rota, Tinian, Guguan, Pagan, Agrihan, and Maug (Reichel and Glass 1991, DFW files). Marshall (1949) reported this species in flocks of 12–100 individuals and collected birds from Tinian and Saipan, and others reported flocks of white herons on Saipan and Tinian (Gleize 1945, Stott 1947). However, recently they have been seen in much smaller numbers (up to eight). This species was once the most common egret in Japan, but has declined markedly there because of pollution and disturbance to breeding colonies (Brazil 1991). Intermediate Egrets winter in southwestern Japan and are accidental to the Ogasawara and Iwo Islands (Brazil 1991). This species is a resident in Australia (Pizzey 1980), and banded birds have been recovered in New Guinea, where large flocks are present during the austral winter (Hancock and Kushlan 1984, Beehler et al. 1986). This species is an uncommon migrant in Palau and Yap (Engbring 1988; H. D. Pratt, pers. comm.).

**LITTLE EGRET (*Egretta garzetta*).** This is a rare migrant and winter visitor in the Marianas, recorded on Saipan, Guam, and Pagan (Engbring and Owen 1981, Stinson et al. 1991, Wiles et al. 1993). It has also been recorded annually on Guam since 1987, and since 1989 on Saipan (Wiles et al. 1993, DFW files). They have been recorded in all months from September to May, with the largest number recorded being six. Little Egrets are seen at a variety of freshwater wetlands including lakes on Saipan and Pagan and small ponds, with rare sightings at mudflats and reef flats. The yellow feet and grayish lores indi-

cate visitors are of the Old World race *E. g. garzetta*. The Little Egret is a common resident in Japan, with birds wintering in coastal areas from Tokyo southwest through the Nansei Shoto (Ryukyu Islands) (Brazil 1991). McClure (1974) listed recoveries in the Philippines of birds banded in Japan and Taiwan, and birds banded in Australia recovered in New Guinea, where it is a common visitor (Beehler et al. 1986). Hancock and Kushlan (1984) stated that most Asian birds winter in the Philippines. The Little Egret is an uncommon winter visitor in Palau and Yap (Engbring 1988; H. D. Pratt, pers. comm.).

**CATTLE EGRET (*Bubulcus ibis*).** Cattle Egrets are the most abundant migratory ardeid in the Marianas and a common winter visitor. The first published record was not until 1967 (Drahos 1977), and Pratt and Bruner (1981) noted an apparent increase in Micronesia. Cattle Egrets have been recorded in the Marianas in all months except July, though most records are September–April (Figure 3). Birds typically arrive on Guam between 17 September and 10 October. Flocks of a few individuals to over 100 forage among cattle in pastures on Saipan and Tinian, and on Guam among cattle or water buffalo (*Bubalus bubalus*). They also forage in airport fields. These egrets have also been reported from Rota, Aguiguan, Guguan, and Pagan (Pyle and Engbring 1987, Glass et al. 1990).

Glass et al. (1990) gave an account of 21 northbound flocks in spring of 1986 and speculated that sizable numbers of Cattle Egrets pass through the Marianas during spring migration. D. Aldan (pers. comm.) made similar observations of northbound flocks during evenings of March–April 1993. However, on the evening of 4 May 1993, D.W.S. observed five northbound flocks totaling 88 birds and a single flock of 91 birds crossing the channel south toward Tinian the next morning. This strongly suggests that the conclusions of Glass et al. (1990) were in error and that the egrets were instead making daily flights between a night roost on Saipan and cattle pastures on Tinian. Island residents report that Cattle Egrets roost in the casuarinas (*Casuarina equisetifolia*) and possibly the reeds (*Phragmites karka*) near Lake Susupe on Saipan. Birds have also roosted in water ferns (*Acro-*

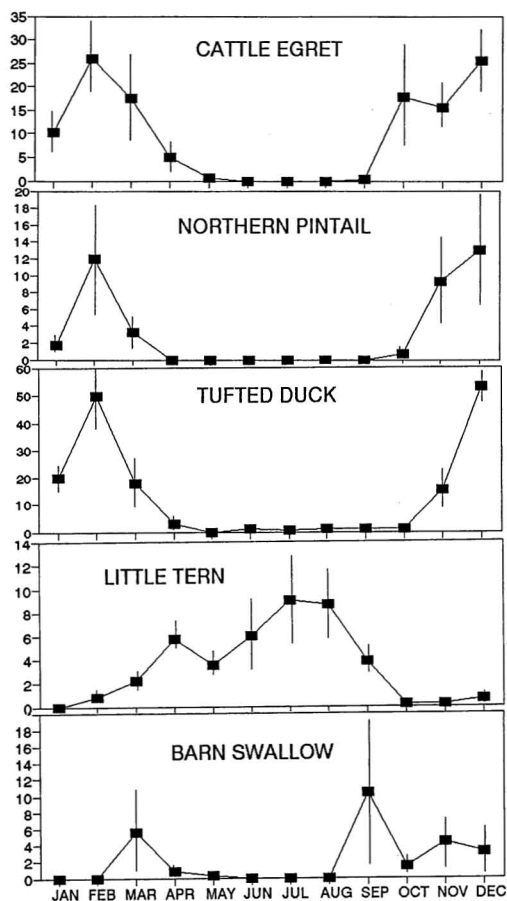


FIGURE 3. Mean monthly maximum numbers of five regular migrant species on Saipan, 1987–1993.

*stichum aureum*) and possibly the reeds and hibiscus (*Hibiscus tiliaceus*) at Lake Hagoi on Tinian, in scattered mangrove trees at a wetland on Naval Station, Guam, and in coconut trees (*Cocos nucifera*) on Cocos Island.

The Cattle Egret is a common visitor in Palau and Yap (Engbring 1988; H. D. Pratt, pers. comm.) and a locally common summer visitor in Japan, wintering from central Honshu southwest (Brazil 1991). Cattle Egrets banded in Japan were recovered in the Philippines, and birds banded on Taiwan have been recovered in Japan, the Philippines, Borneo, and Palau (McClure 1974, Hancock and Kushlan 1984). Beehler et al (1986)

indicated that Cattle Egrets are a visitor to New Guinea and have increased in recent years.

**STRIATED HERON** (*Butorides striatus*). This species is a rare migrant and winter visitor recorded on Saipan or Guam annually since 1986 (except 1992). It was first recorded in 1979 on Saipan (Engbring and Owen 1981), and there have been sporadic records in all months from September to March. They are usually found singly, but two birds overwintered on Saipan in 1986–1987 and possibly one or two in 1993–1994. All the Saipan records have been at tidal flats, but two recent Guam records were at a commercial fish pond and a sewage treatment pond. Striated Herons are a “fairly common” summer visitor and winter on southern Kyushu and the Nansei Shoto and there is a single record from the Iwo Islands (Brazil 1991). Most subspecies are sedentary, but the wintering area of the migrant subspecies *amurensis* includes the Philippines (Hancock and Kushlan 1984). On New Guinea, Striated Herons breed sparsely along coastal rivers (Beehler et al. 1986). H. D. Pratt (pers. comm.) considers the Striated Heron a vagrant or rare visitor in Micronesia because he has no record of them on Palau and only a single record from Yap.

**BLACK-CROWNED NIGHT-HERON** (*Nycticorax nycticorax*). This species is a very rare migrant and winter visitor in the Marianas. The first record of six birds on 4 April 1945 on Tinian (Marshall 1949) remains the largest number reported. There have been Saipan records from November–February since 1987 (Glass et al. 1990, DFW files). Additional records include specimens from Rota and Guam (Wiles et al. 1993, Stinson et al. 1995). The Saipan records were at Lake Susupe or seasonal ponds, and the Guam bird was in mangroves. This species is common and widespread in Japan, with northern birds shifting south in winter. It has also been recorded from the Ogasawara and Iwo Islands (Brazil 1991). It is a rare visitor to Palau, Yap, Chuuk, and Pohnpei (Pratt et al. 1987, Engbring 1988).

**COMMON TEAL** (*Anas crecca*). The Common or Green-winged Teal is a rare migrant and win-



ter visitor, with reports from Pagan, Tinian, Saipan, Rota, and Guam (Hachisuka et al. 1932, Wiles et al. 1987, Glass et al. 1990, Stinson et al. 1995). Mariana records exist for all months from mid-November to mid-April. Common Teal were seen at small ponds on Saipan each year from 1986 to 1990 and from 1992 to 1993. On Guam they have been recorded in less than half of all years since 1985. This species breeds and winters in Japan where it was once the most common duck, but has declined somewhat in recent years (Brazil 1991). It has also reached Palau (Engbring 1988), the Ogasawaras (Kuroda 1961), and Iwo Islands (Brazil 1991).

**MALLARD** (*Anas platyrhynchos*). Mallards are a very rare winter visitor to the Marianas. The first reports include a flock of 40 on Pagan in 1978, a sighting at Sarigan in September 1983, and a possible sighting on Tinian in 1984 (Glass et al. 1990). Most recently, four were recorded on Saipan in November 1992 and January 1993 (Stinson et al. 1995). Mallard records in the Marianas are important because the extinct endemic Mariana Mallard (*A. oustaleti* or *A. p. oustaleti*) seems to have been a stabilized hybrid of Mallard and Pacific Black or Gray Duck (*A. superciliosa*) (Yamashina 1948, Reichel and Lemke 1994). *A. superciliosa*, a duck of the Australasian and South Pacific regions, is a rare breeding resident in Palau and Chuuk (Pratt et al. 1987), but it has never been recorded in the Marianas. The Mallard is the most common wintering duck in Japan and has been recorded in the Ogasawara and Iwo Islands (Kuroda 1961, Brazil 1991).

**NORTHERN PINTAIL** (*Anas acuta*). The Northern Pintail is an uncommon migrant and winter visitor to the Marianas (Figure 3). Birds are recorded annually on Saipan and Guam, with some additional reports for Tinian, Rota, and Pagan (Hachisuka et al. 1932, Pyle and Engbring 1987, Glass et al. 1990). Pintails are the most common dabbling duck, with up to 35 birds recorded at Lake Susupe, Saipan. Most records are from October to March; but there are records from September and April for Guam and summer records from May on Saipan and July on Tinian (U.S. Army Corps of Engineers 1986;

D.W.S., pers. obs.). This species is one of the most common ducks wintering in Japan and it has been recorded in the Iwo Islands (Brazil 1991). The pintail is an uncommon migrant in Palau and Yap, and a rare vagrant to New Guinea (Beehler et al. 1986, Engbring 1988; H. D. Pratt, pers. comm.).

**GARGANEY** (*Anas querquedula*). The Garganey is a rare migrant and winter visitor to the Marianas, with sightings made in most recent years on Saipan and Guam. The most common observation dates for these islands include all months from October to March, but single records exist for mid-September and April (Marshall 1949, DFW files). Up to eight birds have been recorded per sighting. This species is also known from Tinian (Marshall 1949). Brazil (1991) described the Garganey as an "uncommon, but regular migrant in small numbers . . . and an occasional and rare winter visitor" to Japan. It has been recorded in the Ogasawara Islands (Brazil 1991) and is a rare winter visitor to New Guinea and Palau (Beehler et al. 1986, Engbring 1988). Vagrants may occur annually in Australia (Madge and Burn 1988).

**NORTHERN SHOVELER** (*Anas clypeata*). This is a rare migrant and winter visitor to the Marianas, with records on Pagan, Saipan, Tinian, Guam, and Rota (Hachisuka et al. 1932, Marshall 1949, Drahos 1977, Glass et al. 1990, Stinson et al. 1995). This species is documented in all months from September to April. Shovelers were recorded most years since 1983 on Saipan, but less than half of recent years on Guam. Up to 18 shovelers have been recorded, but sightings of one or two are more typical. Brazil (1991) reported that the shoveler is a "not uncommon migrant and winter visitor" in Japan, but he did not cite any record of shovelers in the Ogasawara or Iwo Islands. Vagrants reach Yap, New Guinea, and Australia (Madge and Burn 1988; H. D. Pratt, pers. comm.), though there are not yet records from Palau (Engbring 1988).

**GADWALL** (*Anas strepera*). This species is a very rare winter visitor first recorded on Tinian in 1984 (Wiles et al. 1987) and later on Saipan

from December 1987 to February 1988 (Glass et al. 1990) and again from mid-November 1992 to mid-March 1993. The only records for Guam are from January, February, and December 1993 (Wiles et al. 1993). The maximum number reported has been seven. Brazil (1991) reported that Gadwalls are a "not uncommon" winter visitor to Japan. There appear to be no records from Palau, Yap, New Guinea, or Australia (Pizzey 1980, Beehler et al. 1986, Engbring 1988).

**EURASIAN WIGEON** (*Anas penelope*). This species is a rare migrant to the Marianas, with records for most recent years on both Saipan and Guam. All sightings have occurred between October and March. It was first recorded from Tinian (Hachisuka et al. 1932). The maximum number recorded has been five. Brazil (1991) reported that this species is a common migrant and locally abundant winter visitor to Japan. Kuroda (1961) listed this species from both the Ogasawara and Iwo Islands. It is a rare vagrant to New Guinea and Palau (Beehler et al. 1986, Engbring 1988).

**COMMON POCHARD** (*Aythya ferina*). The Common Pochard is a very rare winter visitor, with a handful of records during November to March on Saipan and Guam (Maben and Wiles 1981, Stinson et al. 1991, DFW files; G.J.W., unpubl. data). Usually only one or two pochards are seen, but recent Guam records include a flock of eight in December 1989 and seven in January 1995. Pochards were seen at ponds and lakes of all sizes. In Japan, the pochard is locally a very common visitor, and it breeds in small numbers on Hokkaido (Brazil 1991). Madge and Burn (1988) stated that vagrants reach the Philippines and Pratt et al. (1987) listed a record from Midway, but Beehler et al. (1986) did not list this species for New Guinea.

**TUFTED DUCK** (*Aythya fuligula*). This species is a common annual migrant and winter visitor to the Marianas (Figure 3). It is the most abundant migrant duck in the archipelago, with flocks of up to 82 observed at Lake Susupe on Saipan. Tufted Ducks are recorded annually on Saipan and Guam, with all Saipan records between mid-

October and mid-April, except single females that summered on Saipan in 1986, 1987, and possibly 1988. On Saipan, Tufted Ducks are primarily seen at Lake Susupe, but scattered individuals have been recorded at smaller wetlands and the airport. On Guam, Tufted Ducks occur in a variety of marshes and small ponds, but tend to avoid the much larger Fena Reservoir. They have also been recorded at the Rota airport, Lake Hagoi on Tinian, and on Pagan. Madge and Burn (1988) indicated that the southeastern limit of the Tufted Duck's regular wintering grounds is Japan, Taiwan, and Luzon (the Philippines), and that vagrants are reported from "several Pacific islands east to Hawaii." But our data indicate that the species is an annual winter visitor on Saipan and Guam. Pratt et al. (1987) stated that Tufted Ducks winter uncommonly in western Micronesia (Palau, Yap, and the Marianas) and occur as vagrants in the Marshalls and Hawaiian Islands. Tufted Ducks are a common migrant and winter visitor in Japan and a straggler to the Ogasawaras (Kuroda 1961, Brazil 1991). Brazil (1991) reported that nonbreeders regularly summer on Hokkaido, where the species is a rare breeder.

**BLACK-HEADED GULL** (*Larus ridibundus*). This gull is a rare winter visitor to the Marianas. First recorded on Guam in 1978, it has been recorded annually on Saipan since 1983 and about half those years on Guam (Jenkins 1978, Glass et al. 1990, DFW files). Single birds are usually observed, but up to six birds have been recorded. Gulls use a variety of sites including airports, mudflats, and Lake Susupe. Records exist for late December to April. Recent sightings reflect a broader trend of increased Indo-Pacific records that may reflect a general southward expansion of the species' wintering range in the Eastern Hemisphere (Argeloo 1993). This widespread Eurasian gull is a common migrant and winter visitor in Japan (Brazil 1991). It is an uncommon migrant in Palau and a very rare visitor to New Guinea (Beehler et al. 1986, Engbring 1988).

**COMMON TERN** (*Sterna hirundo*). The Common Tern is a rare migrant and winter visitor reported from Guam and Saipan (Williams and



Grout 1985, Glass et al. 1990, DFW files). Terns believed to be this species are seen over Apra Harbor at Guam in most years, but positive identifications are infrequent. Most records from Guam occur from late August to January, with single sightings also reported for March, April, and June, and Saipan records from September, February, and March. This species is a common spring and autumn migrant along the coasts of Japan (Brazil 1991) and an uncommon migrant in Palau and Australia (Pizzey 1980, Engbring 1988). Beehler et al. (1986) considered the Common Tern an abundant seasonal visitor in New Guinea.

**LITTLE TERN** (*Sterna albifrons*). Little Terns are a rare migrant on Guam, with records occurring from August to December in about half of recent years. In contrast, Little Terns are consistently present in small numbers on Saipan from February to September (Figure 3). This species seems to be attempting to expand its breeding range to include Saipan, where up to 16 birds forage in the coastal lagoon and roost and lay eggs near shore on rusting war wreckage and buoys (Reichel et al. 1989). Little Terns make occasional use of aquaculture ponds on Guam, in addition to shallow coastal waters. Little Terns breed across much of the Old and New Worlds and along the western Pacific Rim (Japan, the Philippines, New Britain), but were not known to breed in Micronesia. The species is a vagrant in the Ogasawaras (Brazil 1991).

**WHISKERED TERN** (*Chlidonias hybridus*). This species is a very rare vagrant and winter visitor in the Marianas, with records from 10 September to 18 May on Guam and Saipan (Glass et al. 1990, Wiles et al. 1993, DFW files; G.J.W., unpubl. data). Observations are usually of one or two, but during the autumn of 1994, several large mixed flocks of this species and White-winged Terns (*Chlidonias leucopterus*) with 10 to possibly 50 birds were seen on Guam and Rota (Wiles and Worthington 1996). Whiskered Terns are seen at Lake Susupe, aquaculture ponds, and airports. Brazil (1991) indicated that this species is a rare late summer and autumn migrant in Japan. It is a very common visitor to New Guinea from Australia from February to

October, with stragglers in other months (Beehler et al. 1986). H. D. Pratt (pers. comm.) has recorded Whiskered Terns on Yap during February visits, and once in February on Babeldoab, Palau.

**WHITE-WINGED TERN** (*Chlidonias leucopterus*). The White-winged Tern, first reported by Oustalet (1896) on Guam, is a rare migrant recorded in most recent years. Sightings from Guam and Rota are apparently restricted to late August through December, although several records for Saipan and Tinian extend into January, February, and March (Glass et al. 1990, DFW files). Usually recorded singly or in pairs, this is the most commonly seen migrant tern at freshwater wetlands on Saipan and Guam. During autumn 1994, several unusually large mixed flocks of up to 50 White-winged and Whiskered Terns appeared on Guam and Rota (Wiles and Worthington 1996). The White-winged Tern is a rare migrant in Japan (Brazil 1991). It is a common visitor to New Guinea and Australia (Pizzey 1980, Beehler et al. 1986), and an uncommon migrant in Palau (Engbring 1988).

#### *Species Accounts: Land Birds*

**OSPREY** (*Pandion haliaetus*). The Osprey is a very rare visitor to the Marianas, with records from Guam in 1945, November 1968, and the winters of 1984–1985 and 1985–1986 (Baker 1951, GDAWR files); from Saipan in November 1985 (Wiles et al. 1987); and from Pagan in April and November 1989 (Stinson et al. 1991). This cosmopolitan species has also been recorded on the Ogasawara and Iwo Islands (Kuroda 1961) and breeds locally elsewhere in Japan (Brazil 1991). It is a rare migrant to Palau and Yap (Engbring 1988; H. D. Pratt, pers. comm.) and a coastal resident of New Guinea (Beehler et al. 1986).

**CHINESE GOSHAWK** (*Accipiter soloensis*). We consider the Chinese Goshawk to be a very rare migrant and winter visitor. However, this status may need to be revised because sightings seem to have increased. This species or unidentified small accipiters have been seen in very small

numbers most of the last few years. In autumn 1992 greater than usual numbers of goshawks were reported on Saipan, Rota, Tinian, and Guam, and specimens were obtained on Rota and Tinian (Wiles et al. 1993, Stinson et al. 1995). Most of the birds disappeared within a month and probably continued their migration, but several were seen through mid-January 1993. Small numbers of the hawks were again observed regularly from mid-September 1994 to late March 1995 on Guam. These influxes may have been caused by the disruption of their southward migration by stormy weather (Stinson et al. 1995). This species was first collected on Rota (Hachisuka et al. 1942). Other recent records include 1984 and 7 April 1990 on Saipan and 30 November–1 December 1986 on Rota (Glass et al. 1990, DFW files). Large numbers of Chinese Goshawks migrate through southern Japan and the Nansei Shoto in September and October each year, but this species has not been reported from the Ogasawara or Iwo Islands (Brazil 1991). This species is a rare migrant to western New Guinea (Beehler et al. 1986) and probably a regular winter visitor to Palau and Yap (Engbring 1988; H. D. Pratt, pers. comm.).

**SHORT-EARED OWL** (*Asio flammeus*). This species, first listed by Quoy and Gaimard (1824) from Tinian, is a very rare visitor to the Marianas. Recent reports are from Guam in November 1968, December 1982, December 1985, and February 1986 (Drahos 1977; G.J.W., unpubl. data); from Saipan in December 1985 and November 1987 (Glass et al. 1990); and from Rota in March 1992 (Stinson et al. 1995). Hachisuka et al. (1942) recorded it on Pagan. Most sightings are from airports on Saipan and Rota, and grasslands on Guam. Baker (1951) stated that owls were well-known to the residents of Guam in the 1940s. This suggests that the species was once a more common migrant or possibly bred on the island. Elsewhere in Micronesia, Short-eared Owls are resident only on Pohnpei. This species is a regular winter visitor in Japan and is recorded from the Ogasawaras (Brazil 1991). It is not listed for Palau or New Guinea (Beehler et al. 1986, Engbring 1988).

**FORK-TAILED SWIFT** (*Apus pacificus*). This species is a very rare migrant in the Marianas,

with five records between 10 October and 9 November. Flocks of one to five birds have been observed on Saipan in 1983 and 1984, on Guam in 1990 and 1991, and on Rota in 1992 (Glass et al. 1990, Wiles et al. 1993, Stinson et al. 1995). The Fork-tailed Swift breeds in eastern Asia, including Japan where it is locally common (Brazil 1991). It migrates to Australia and New Guinea, typically reaching northern Australia in early October (Pizzey 1980). No records are known from Palau, Yap, or the Ogasawara and Iwo Islands (Engbring 1988, Brazil 1991), though there is one record from the Marshalls (Kwajalein) and a hypothetical record from Chuuk (Pratt et al. 1987; H. D. Pratt, pers. comm.).

**BARN SWALLOW** (*Hirundo rustica*). This species is an uncommon passage migrant in the Marianas and occasional winter visitor. On Guam, nearly all records occur between August and October, with a few additional sightings in November, December, and March. A smaller spring peak in migration has been noted on Saipan in March to May (Figure 3). Flock sizes typically range from several to 24 birds. A flock of Barn Swallows wintered at the Saipan landfill several years during the 1980s, but has not done so since 1989. They have also been recorded from Tinian, Rota, and Uracus (Baker 1951, Glass et al. 1990). Barn Swallows are an abundant summer visitor and very common migrant throughout Japan, and are known to winter in the Ogasawara and Iwo Islands (Brazil 1991). The Barn Swallow is a common migrant in New Guinea and Palau (Beehler et al. 1986, Engbring 1988), and an uncommon migrant east to Pohnpei.

## DISCUSSION

### *Waterbirds*

Based on Hachisuka et al. (1942), Kuroda (1961) listed only six Palearctic ducks and no herons that had reached the Marianas. He compared this with a list of 10 ducks and 10 herons that had been recorded from the Ogasawara and Iwo Islands and proposed that the Iwo Islands were the southern limit of migrating herons. Our

data indicate that several hundred to 1000 Cattle Egrets annually migrate and winter in the Marianas and Little and Intermediate Egrets occur as migrants or winter visitors in small numbers. An additional eight species are rare vagrants or accidentals to the archipelago. There is now broad similarity in the migrant ardeid species recorded in the Iwo or Ogasawara Islands groups (13 species), Palau (10), Yap (9), and the Marianas (10). All of the ardeid species listed here have been recorded in the Iwo or Ogasawara Islands except the Black Bittern (*Ixobrychus flavicollis*), a species of South Asia and Australia. Three species of ardeids, including Japanese Night-heron (*Gorsachius goisagi*), Schrenck's Bittern (*Ixobrychus erythymus*), and Cinnamon Bittern (*I. cinnamomeus*), have been recorded from the Ogasawaras and Iwos, but not recorded in the Marianas.

Kuroda (1961) listed the Yellow Bittern (*Ixobrychus sinensis*) as a migrant to the Iwos and Ogasawaras, but migratory individuals do not seem to reach the Marianas. They are a common breeding resident from Guam north to Saipan, but they have never been recorded on the Marianas north of Saipan. The Philippines have both resident breeders and a large seasonal influx of migrants (Hancock and Kushlan 1984). The species is a locally common summer breeder in Japan (Brazil 1991) and a locally abundant winter visitor in New Guinea (Beehler et al. 1986).

Tufted Ducks and Northern Pintails occur annually in small to modest numbers as migrants or winter visitors. Four duck species (Common Teal, Garganey, Northern Shoveler, and Eurasian Wigeon) visit irregularly in very small numbers, apparently at the southeastern fringe of their winter range. An additional nine species of waterfowl have been recorded as very rare visitors or accidentals. Since 1961, when Kuroda listed six ducks for the Marianas, the total number of waterfowl recorded has increased to 15. Seven of these waterfowl species have not been recorded in the Ogasawara or Iwo Islands, but six species including Whooper Swan (*Cygnus cygnus*), White-fronted Goose (*Anser albifrons*), Bean Goose (*A. fabalis*), Bar-headed Goose (*A. indicus*), Mandarin Duck (*Aix galericulata*), and Baikal Teal (*Anas formosa*) have been recorded in those islands, but not in the Marianas. Fewer

species of waterfowl have been recorded in Palau (6) and Yap (5), probably because of the scarcity of freshwater ponds and perhaps the fewer number of surveys there.

#### Land Birds

Many more species of northern land bird migrants are recorded in the Ogasawara and Iwo groups than in the Marianas. Nineteen species of land birds, primarily raptors and passerines, have been recorded in the Marianas as migrants or vagrants. The Chinese Goshawk and Fork-tailed Swift have been recorded irregularly as migrants or winter visitors, perhaps when weather affects their normal migration pattern. Few passerines migrate over water in this part of the western Pacific. The only passerine known to migrate annually through the Marianas is the Barn Swallow. Since Kuroda (1961) reported that only one vagrant passerine had ever reached the Marianas, five additional species have been recorded. Kuroda (1961) listed these six among the 32 passerines and 13 other land birds then listed as northern migrants to the Ogasawara or Iwo Islands. An additional 14 species (nine passerines, three raptors, two other) of northern migrants have been recorded in the Iwos and Ogasawaras since, or were not known to Kuroda (Brazil 1991). Of the additional records, only the Eurasian Hoopoe (*Upupa epops*) has also been recorded in the Marianas. Four raptors and one swift have been recorded in the Marianas, but not recorded in the Ogasawaras or Iwos. The Common Buzzard (*Buteo buteo*) can probably be added as a resident species in the Marianas (Reichel et al. 1994). This species is also among Kuroda's "settlers from the north" in the Ogasawara and Iwo Islands. Palau, which is much closer to New Guinea, the Philippines, and the Asian mainland than the Marianas, also hosts more species of migrant land birds (27). Engbring (1988) listed the Barn Swallow as a common migrant and the Oriental Cuckoo (*Cuculus saturatus*), Dollarbird (*Eurystomus orientalis*), Gray-spotted Flycatcher (*Muscicapa griseisticta*), Siberian Rubythroat (*Luscinia calliope*), and the Yellow Wagtail (*Motacilla flava*) among uncommon migrants to Palau. Australian migrants recorded in Palau

include the Rainbow Bee-eater (*Merops ornatus*), Brush Cuckoo (*Cacomantis variolosus*), and perhaps some Dollarbirds. The Long-tailed Cuckoo (*Eudynamus taitensis*) migrates from New Zealand. The lower combined number of species represented in Palau is probably an artifact of a scarcity of resident observers. The total for Yap is probably also affected by the lack of resident observers, island size, and limited wetland habitat.

It appears that Kuroda's proposal that the Iwo Islands were the "main limit" of southward migration in the Pacific islands is accurate for land birds, with the possible exception of the Barn Swallow. However, among the Ardeidae, a substantial number of Cattle Egrets and a small number of other herons annually migrate through or to the Marianas.

Baker's (1951) suggested routes of colonization need to be revised in light of more recent information, but he is probably correct that the Marianas land and freshwater avifauna includes components from Melanesia, the Philippines, and Polynesia. Most migrants recorded in the Marianas are from the Palearctic, but of the current resident species only *Gallinula chloropus guami*, *Anas platyrhynchos oustaleti*, *Ixobrychus sinensis*, and *Acrocephalus luscini* appear to have Palearctic origins. These species, along with *Asio flammeus*, may have arrived in Micronesia via the Ogasawara and Iwo Islands.

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