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Northern Marshall Islands land biota: birds

by

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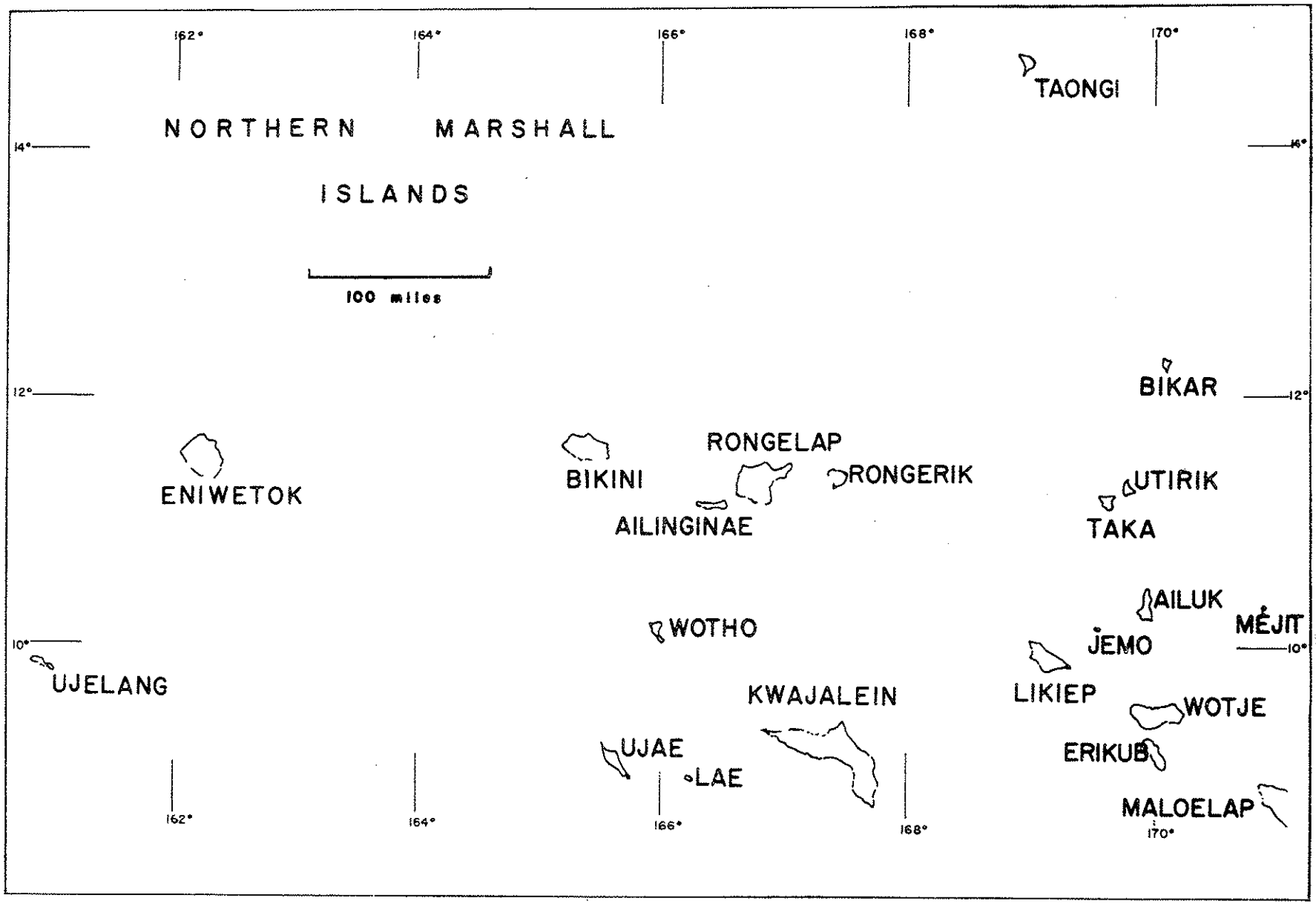

FIGURE 1. MAP OF THE NORTHERN MARSHALL ISLANDS

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Although ornithological observations have not been the main object of any phase of our work on the Northern Marshall Islands, numerous notes on birds have accumulated which are here placed on record. The birds were identified by use of Ernst Mayr's "Birds of the Southwest Pacific" and the names used here are mostly those accepted by Mayr in that work. Unfortunately it was impractical to document these records with specimens. The sight observations presented should therefore be accepted with some reservations.

The observations recorded here were mainly made on the U.S. Geological Survey expeditions to the Northern Marshalls in 1951 and 1952, when the author was a passenger on U. S. Army survey ships. Additional notes were made on Wake Island in 1953, 1961, and 1963, and in the Northern Marshalls in 1956, this time courtesy of the U. S. Naval Radiological Defense Laboratory, and on several briefer visits.

The atolls visited were Wake, Pokak, Bikar, Rongelap, Ailinginae, Rongerik, Taka, Utirik, Ailuk, Jemo, Likiep, Wotho, Ujelang, Ujae, Lae, and Kwajalein. Details of the 1951-1952 trips may be found in Atoll Research Bulletin 38: 1-36, 1955. No account of the later visits has been prepared, though lists of the land plants have been published as well as an account of what may have been fallout damage (ARB 61: 1-11, 1959).

Here will be given a very brief description of each atoll and its bird fauna, then a systematic list by species, with observation on occurrence, numbers, behavior, and anything else of interest under each one.

DESCRIPTION OF ATOLLS VISITED AND LISTS OF BIRDS SEEN

Wake Atoll

Wake Atoll (see ARB 66: 1-22, 1959, 67: 1-20, 1959) is semiarid in aspect, with pronounced dry seasons, and is largely wooded with low trees and shrubs. It undoubtedly supported very large bird colonies at one time, but, probably because of World War II, in 1951-52 there were relatively few birds. Rats were very abundant in the late 1940's and early 1950's but were almost eliminated by a poisoning campaign in 1952 by Mr. Fred Schultz. Whether they have multiplied again I do not know. A typhoon in 1952 caused widespread devastation to the vegetation and doubtless to the animal population. The island was visited October 22, 1951; April 19-21, 1952; July 18, 1952; October 22-23, 1953; September 8-13, 1961; and March 7-9, 1963. The following birds were seen:

TABLE I: Species recorded from various atolls and islands in the northern Marshall Islands during the present study.

	Ailinginae	Ailuk	Bikar	Jemo	Kwajalein	Lae	Likiep	Pokak	Rongelap	Rongerik	Taka	Ujae	Ujelang	Utirik	Wake	Wotho
Black-footed Albatross (offshore only)								X								
Wedge-tailed Shearwater								X								
White-tailed Tropicbird			X					X						X	X	
Red-tailed Tropicbird			X					X							X	
Masked Booby			X					X							X	
Brown Booby			X	X	X			X			X	X			X	X
Red-footed Booby			X	X				X?				X			X	
Great Frigatebird		X	X	X	X			X				X	X		X	X
Reef Heron		X			X	X	X	X				X	X			X
Pintail Duck															X	
Muscovy Duck													X	X		X
Chicken		X		X		X	X		X				X	X		X
Golden Plover		X	X	X	X	X	X	X	X			X	X	X	X	X
Ruddy Turnstone	X	X	X		X	X	X	X	X		X	X	X	X	X	X
Whimbrel					X	X						X		X		X
Bristle-thighed Curlew	X	X	X					X	X	X	X	X	X	X	X	X
Wandering Tattler			X		X	X		X		X		X	X	X	X	X
Bar-tailed Godwit (?)					X											
Black-naped Tern		X	X		X							X	X			X
Bridled Tern			X					X								
Sooty Tern		X	X		X			X			X		X		X	
Crested Tern			X		X	X		X				X	X	X		X
Blue-gray Noddy			X					X								
Common Noddy	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
White-capped Noddy	X	X	X	X	X	X		X	X		X	X	X			X
Fairy Tern	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New Zealand Cuckoo							X									
Indian Myna					X											
Java Sparrow															X	

1. Phaethon lepturus
2. Phaethon rubricauda
3. Sula dactylatra
4. Sula leucogaster
5. Sula sula
6. Fregata minor
7. Anas acuta
8. Pluvialis dominica
9. Arenaria interpres
10. Numenius tahitiensis
11. Heteroscelus incanum
12. Sterna fuscata
13. Anous stolidus
14. Gygis alba
15. Padda oryzivora

Pokak Atoll

Pokak Atoll is even more arid than Wake and has somewhat the same aspect, but with lower trees and far fewer species. Rats and lizards are common, but because the island has never been inhabited and presents landing difficulties, it is one of the finest sea bird rookeries in the central Pacific. When a ship whistle was sounded off Kamome Islet in 1951, the sky was literally blackened above the islet by the birds that flew up. These were probably mostly Sooty Terns, but many other species were also present. The atoll was visited November 25, 1951 (examined only from ship); March 25, 1952 (examined only from ship), and July 20-27, 1952. The week spent on this atoll in July 1952, by C. G. Johnson and me, was probably the first scientific investigation to be made there. Birds observed were:

1. Diomedea nigripes (offshore only)
2. Puffinus pacificus
3. Phaethon lepturus
4. Phaethon rubricauda
5. Sula dactylatra
6. Sula leucogaster
7. Sula sula
8. Fregata minor
9. Demigretta sacra
10. Pluvialis dominica
11. Arenaria interpres
12. Numenius tahitiensis
13. Heteroscelus incanum
14. Sterna lunata
15. Sterna fuscata
16. Thalasseus bergii
17. Procelsterna cerulea
18. Anous stolidus
19. Anous tenuirostris
20. Gygis alba

Bikar Atoll

This rather small atoll is almost undisturbed by man. The only obvious evidence of his presence is a small grove of coconuts on Bikar Islet, which is otherwise covered partly with dense Pisonia forest and partly with open scrub; one projecting rocky part is completely bare of vegetation. The other two islets of any size are also mostly covered by Pisonia forest, but have some open Tournefortia "orchard" and some herbaceous vegetation. A small sandbank, Laborero Islet, has only a thin growth of Portulaca. The atoll was visited November 28, 1951 (examined only from ship); March 24, 1952 (examined only from ship); and August 8-11, 1952.

Birds are to be seen in great abundance--indeed this is one of the finest rookeries in the Marshalls, second only to Pokak. It is said to have been preserved as a bird sanctuary, protected by taboos, in pre-European times. Birds seen were:

1. Phaethon lepturus
2. Phaethon rubricauda
3. Sula dactylatra
4. Sula leucogaster
5. Sula sula
6. Fregata minor
7. Pluvialis dominica
8. Arenaria interpres
9. Numenius tahitiensis
10. Heteroscelus incanum
11. Sterna sumatrana
12. Sterna lunata
13. Sterna fuscata
14. Thalasseus bergii
15. Procelsterna cerulea
16. Anous stolidus
17. Anous tenuirostris
18. Gygis alba

Kwajalein Atoll

This is an enormous atoll, one of the largest in the world in total area. Its larger islets are among the most completely altered of all islands in the Pacific. It was the scene of heavy fighting in World War II and has been used as an American base ever since. Some of the smaller islets are still relatively undisturbed, and have been remarkably little explored considering how close they are to a major stopping place of trans-Pacific planes. Some of them, as seen from the air, have good native forest, though most are planted to coconuts or covered by installations of one sort or another. One islet, Enivetak, inside the lagoon rather than on the reef, is covered by magnificent Pisonia forest, perhaps the finest still to be found anywhere. Here are great numbers of birds. It is probable that this islet was reserved as a bird sanctuary in pre-European times, protected by taboos, and through some miracle, perhaps a lingering fear of the taboo, has remained in a virtually primitive condition.

The atoll was visited a number of times but with little opportunity for serious study; January 15-28, February 29 and March 15, 1952, February 2-12, 1956; and several briefer stops on other dates.

Considerable numbers of birds persist on the atoll, and a few of them have even accommodated themselves to the presence of men in great numbers. Here, also, is the only naturalized exotic bird in the Marshalls, the mynah. Species seen were:

1. Sula leucogaster
2. Fregata minor
3. Demigretta sacra
4. Pluvialis dominica
5. Arenaria interpres
6. Numenius phaeopus
7. Heteroscelus incanum
8. Limosa lapponica (?)
9. Sterna sumatrana
10. Sterna fuscata
11. Thalasseus bergii
12. Anous stolidus
13. Anous tenuirostris
14. Gygis alba
15. Acridotheres tristis

Rongelap Atoll

This is a large atoll, inhabited, but with conditions so severe that it is about on the limit of habitability by a self-contained culture. The large islets in the southern part, especially Rongelap Islet, are largely planted to coconuts. Those to the north are smaller and are still largely wooded or partly grassy, most of them having only a few coconuts, and many of these in poor condition or dead. Pisonia forest is still rather common on these islets. The poor condition of the vegetation of this atoll is described in ARB 61: 1-11, 1959. The atoll was visited February 7-9, 15, 1956. Very few birds were seen, both in species and actual numbers. Those seen were:

1. Gallus gallus
2. Pluvialis dominica
3. Arenaria interpres
4. Numenius tahitiensis
5. Anous stolidus
6. Anous tenuirostris
7. Gygis alba

Rongerik Atoll

A fair-sized atoll, elongate north and south, with the largest islet, Eniwetak, on the east reef, Rongerik has been shown to be just too severe an environment for present-day Marshallese habitation. It has not been inhabited in historic times, except when the Bikini people

were moved there for a short time in 1946. This move was unsuccessful, and the people were soon removed. Pisonia and Cordia forests are common, but there has been much disturbance by construction crews in connection with weapons testing in Bikini and Eniwetok. In 1956, the Cordia forest, especially, showed severe dieback at the tips of the branchlets, 2 years after it had been heavily sprinkled with radioactive fallout. There was very little opportunity to study this atoll, only a short visit to Eniwetak Islet on February 11, 1956 (see ARB 51). The very few birds in evidence included the following:

1. Numenius tahitiensis
2. Heteroscelus incanum
3. Anous stolidus
4. Gygis alba

Ailinginae Atoll

This is a rather small atoll, uninhabited, with one islet, Enibuk, largely planted to coconuts; the others are mostly wooded, several of them with small numbers of coconuts and some grassy land with scattered trees. There was doubtless an abundance of birds, but little opportunity was afforded to observe them. One short visit was made to Sifo Islet on February 10, 1956. Birds seen were:

1. Arenaria interpres
2. Numenius tahitiensis
3. Anous stolidus
4. Anous tenuirostris
5. Gygis alba

Taka Atoll

This is a small atoll, moderately dry, but able to support coconuts, which are planted on about one-third of the largest islet, Taka. The rest is covered by a scrub forest, in 1951 appearing quite battered by a recent typhoon. The atoll is uninhabited; hence birds are abundant, especially on the small brushy Watwerok Islet, which is, in its more open parts, a vast rookery of Sooty Terns. Lojiron is another small islet where there were abundant birds, especially Gygis alba, nesting in a small grove of Pisonia trees. The atoll was visited December 5-9, 1951. Birds seen were:

1. Sula leucogaster
2. Arenaria interpres
3. Numenius tahitiensis
4. Sterna fuscata
5. Anous stolidus
6. Anous tenuirostris
7. Gygis alba

Utirik Atoll

This populated atoll has one principal islet and four smaller ones. The larger islet, Utirik, is planted to coconuts, except for a long westward projection, which has been swept bare of vegetation and even of soil by typhoons, and a strip on the northeast side which has an enormous boulder ridge and some scrub forest and meadowlike open ground. Birds were not plentiful on Utirik Islet, but more so on Ealuk Islet, a small islet to the north, where the native scrub forest still exists. The atoll was visited November 23-December 4, 1951, and February 13, 1956. Not much time was spent in observation of birds on this atoll. Only the following were seen:

1. Phaethon lepturus
2. Cairina moschata
3. Gallus gallus
4. Pluvialis dominica
5. Arenaria interpres
6. Numenius phaeopus
7. Numenius tahitiensis
8. Heteroscelus incanum
9. Thalasseus bergii
10. Gygis alba

Likiep Atoll

This is a large atoll, almost completely planted to coconuts, and heavily populated. Our visits were December 11-18, 1951 and February 4 and 14, 1956. Little time was spent studying birds, which were not abundant on the islets visited. The species seen were:

1. Demigretta sacra
2. Gallus gallus
3. Pluvialis dominca
4. Arenaria interpres
5. Anous stolidus
6. Gygis alba
7. Eudynamis taitensis

Jemo Island

Jemo is a single small islet on a linear segment of reef. Although small, difficult to land on, and uninhabited, it has been mostly cleared and planted to coconuts. A strip of rather fine forest still remains along the south and west sides, part of it of huge Pisonia grandis trees. It was in this forest that the association between Pisonia trees, sea birds, and phosphate rock was first noticed, and a theory of atoll phosphate rock formation was first formulated. A part of the coconut plantation, that next to the Pisonia forest and growing on dark soil, is in luxuriant condition. This area was probably under Pisonia forest before clearing. The other half of the plantation was, in 1951, in poor condition indeed, with trees dying before they reached a great

height. The soil here is pure coral sand. On the windward side of the island is a broad, noticeably wind-sheared fringe of Scaevola taccada. Birds were seen in some abundance, especially in the Pisonia forest. What looked like two owl pellets were being chewed by hermit crabs. Our visit was December 18-22, 1951. The birds seen were:

1. Sula leucogaster
2. Sula sula
3. Fregata minor
4. Gallus gallus
5. Pluvialis dominica
6. Anous stolidus
7. Anous tenuirostris
8. Gygis alba

Lae Atoll

This is a medium-sized, fairly wet atoll, populated, and with the largest islets planted to coconuts, but in 1951 some of the smaller islets were still covered at least partially by natural vegetation. Pisonia forest, Ochrosia forest, and mixed forest were well developed. Lae was visited January 6-10, 1952. Birds were fairly common, in spite of the presence of humans, though nowhere abundant. The species seen were:

1. Demigretta sacra
2. Gallus gallus
3. Pluvialis dominica
4. Arenaria interpres
5. Numenius phaeopus
6. Heteroscelus incanum
7. Thalasseus bergii
8. Anous stolidus
9. Anous tenuirostris
10. Gygis alba

Ujae Atoll

Ujae is a fairly wet atoll, elongate east and west, and has many islets; some of them had considerable native vegetation left in 1952, partly replaced by coconut plantation. Mixed forest, Pisonia forest, and Ochrosia forest are all well represented here. According to the people here, they eat all birds that they can catch except the Reef Heron. One method of catching birds was observed. A fire was built at the base of a huge Pisonia tree in which were many nests of the White-capped Noddy. This smouldered for a couple of days; then the tree crashed down. Young but fully feathered noddies were thrown from their nests in large numbers. They could not yet fly and were partly stunned. Five or six dozen birds were gathered up, their wings chopped off, and they were cooked. The atoll was visited February 16-23 and March 2-13, 1952. The following birds were seen:

1. Sula leucogaster
2. Sula sula
3. Fregata minor
4. Demigretta sacra
5. Pluvialis dominica
6. Arenaria interpres
7. Numenius phaeopus
8. Numenius tahitiensis
9. Heteroscelus incanum
10. Sterna sumatrana
11. Thalasseus bergii
12. Anous stolidus
13. Anous tenuirostris
14. Gygis alba

Ailuk Atoll

Ailuk is an elongate atoll extending north and south, with a great number of islets along its eastern reef and only one on the western side. The largest, Ailuk Islet, on the northern end, has a considerable population and is almost entirely planted to coconuts. Most of the smaller islets to the north have at least some coconuts, but many of them still retain at least a strip of native vegetation along their eastern, seaward sides, protecting the coconut trees from excessive wind. A few birds were seen on Ailuk Islet, many more on the smaller islets to the north. The atoll was visited December 24-31, 1951. The birds seen were:

1. Fregata minor
2. Demigretta sacra
3. Gallus gallus
4. Pluvialis dominica
5. Arenaria interpres
6. Numenius tahitiensis
7. Sterna sumatrana
8. Sterna fuscata
9. Anous stolidus
10. Anous tenuirostris
11. Gygis alba

Wotho Atoll

Among those of the northern Marshall Islands with fairly abundant rainfall, Wotho had in 1952 the smallest population and the largest area of native forest. In fact, it was possible here to gain some idea of what the original vegetation of these islands may have been like. Even the larger islets had only been partly cleared and planted to coconuts. Ochrosia forest, possibly the climax vegetation of atolls in this rainfall belt, covered a larger area here than in any other atoll visited. Some Pisonia forest and large areas of mixed forest were found. Coconut crabs, Birgus latro, were more common here than any other place where they were seen. The atoll was visited February 12-16 and March 18-22, 1952. Birds observed were:

1. Sula leucogaster
2. Fregata minor
3. Demigretta sacra
4. Cairina moschata
5. Gallus gallus
6. Pluvialis dominica
7. Arenaria interpres
8. Numenius phaeopus
9. Numenius tahitiensis
10. Heteroscelus incanum
11. Sterna sumatrana
12. Thalasseus bergii
13. Anous stolidus
14. Anous tenuirostris
15. Gygis alba

Ujelang Atoll

The westernmost of the Marshall group, sometimes regarded as one of the Caroline Islands, Ujelang, elongate in an east-west direction, has a considerable number of islets, most of which had some vegetation in 1952. The large Ujelang Islet was planted to coconuts during the German administration. For many years this atoll had no population except plantation laborers, but in 1947 the people of Eniwetok were moved there to make way for the testing of atomic weapons. Birds were, in 1952, generally abundant, especially on islets other than Ujelang itself. The atoll was visited February 5-8, 1952. The following species were observed on this atoll:

1. Fregata minor
2. Demigretta sacra
3. Cairina moschata
4. Gallus gallus
5. Pluvialis dominica
6. Arenaria interpres
7. Numenius tahitiensis
8. Heteroscelus incanum
9. Sterna sumatrana
10. Sterna fuscata
11. Thalasseus bergii
12. Anous stolidus
13. Anous tenuirostris
14. Gygis alba

ACCOUNT OF BIRDS BY SPECIES

Diomedea nigripes — Black-footed Albatross

What was probably the Black-footed Albatross was seen on two occasions flying near Pokak Atoll. On November 25, 1951, a single albatross flew by the ship off this atoll during the morning. On our next visit, March 25, 1952, Charles Frey, engineer, reported seeing a Black-footed Albatross flying near the atoll on our arrival early in the morning. None were seen actually on the islets, or flying nearby during our longer July visit.

Puffinus pacificus — Wedge-tailed Shearwater

Shearwaters were seen at various times at sea, but could not be identified with any confidence. However, on Pokak Atoll, a short distance inland from the lagoon shore of Sibylla, Breje, Kamome, and North Islets, there is an extensive series of rookeries of what seem to be Wedge-tailed Shearwaters, though even with the bird in hand it could not be made to fit, exactly, any of the descriptions in either Mayr's "Birds of the Southwest Pacific" or Alexander's "Birds of the Ocean."

These birds nest in burrows that go straight down about a foot, then horizontally for the same distance or more. The roofs often give way when stepped on. In fact, walking over these sandy areas resulted in caving in a burrow every few steps. The burrows are very abundant wherever the soil is sandy, as close as 3 feet apart. The mouths are marked by low, wide accumulations of sand that is whiter than the general ground color. This results in a most peculiar appearance on air photos of closely spaced white dots. Where there is too much rubble in the soil or the sand is too shallow, the burrows are merely slight depressions concealed by tufts of grass bent over them.

One adult bird stays in the burrow during the day. The other returns and takes its place at dusk. The burrows contained, at the time of our visit, eggs or nearly grown young in various stages of feathering out, up to those almost ready to fly. When the brooding adult bird is either pulled or frightened from a burrow, the egg is often clasped between the feet and is broken when the bird emerges. The egg is white. When the bird is frightened from the burrow, it flutters across the ground before taking flight.

The birds are seen flying near the atoll in small flocks or singly, but not far out at sea.

It was hard to estimate the numbers of these birds, but there must have been many tens of thousands. It is quite possible that other shearwaters or petrels were present, as some of those seen flying at sea were noticeably smaller, but all seen nesting were the same kind and size.

Phaethon lepturus — White-tailed Tropicbird or Bos'n bird

This beautiful bird is not at all common in the northern Marshalls. One was seen flying on Wake Islet, Wake Atoll, near Flipper Point, September 1951 (Sachet), and two were seen flying on Wilkes Islet, Wake Atoll, on March 8, 1963. One was seen flying at sea one-third of the way from Wake to Pokak Atoll on July 19, 1952. Another was seen flying over the seaward side of Sibylla Islet, Pokak, several days later. One was seen flying over the lagoon of Utirik Atoll on December 4, 1951. In the interior of Bikar Islet, Bikar Atoll, in openings in dense Pisonia forest 3 or 4 were seen at a time, flying round and round, making harsh protesting noises. Finally a nest was located about 7 meters up, in a hole in a large Pisonia tree. This could not be reached with the equipment at hand, but birds were seen to enter the hole.

Phaethon rubricauda — Red-tailed Tropicbird

Red-tailed Tropicbirds were only observed on Wake, Pokak, and Bikar.

On Wilkes Islet, Wake Atoll, two were seen flying on March 8, 1963. They were pure satiny white with a red mark near the eye, and black feet visible along body when flying (Sachet).

On Pokak Atoll they were seen fairly commonly, flying over all the islets during the week of July 20-27, 1952. They were nesting in small numbers and incubating eggs on all islets except those west of Sibylla. They are extremely tenacious at guarding their eggs. They scream at anyone who approaches but will not leave their eggs, even when their red spike-like tail feathers are rudely pulled out. The eggs are laid on gravel or sand in open brush. A few almost grown young were seen. They have black-and-white barred feathers on wings and back, similar to the markings on a barred rock chicken. Their beaks are black at this stage but red in the adult birds.

On Bikar Atoll, during the week of August 7-11, 1952, small groups of several to a dozen birds were often seen flying, especially over the north end of Bikar Islet. Here they would fly round and round, making harsh noises. What this was about was not evident. Possibly they wanted to use this area as a nesting site but were disturbed by our camp.

One of the attractive features of the Red-tailed Tropicbird is the roseate sheen to the white parts of the plumage that can be seen as they sit on their eggs.

Sula dactylatra — Masked, or Blue-faced Booby

This was the least frequently observed booby on the atolls visited and was seen only on Wake, Pokak, and Bikar. It was seen mostly on the ground, either nesting or resting. Its beak, here, was a dull yellow, shading to dull bluish or greenish at the base. The young are very white and have deep down that makes them look like animated balls of cotton. On Wake Atoll, October 22-23, 1953, a very few were seen flying with

frigatebirds and Brown Boobies over Peale Islet. In the sea around Pokak Atoll, Masked Boobies were observed flying and fishing with both other kinds on March 25, 1952, in small numbers. In July, these birds were seen singly or in pairs almost anywhere on the atoll except South Islet, always sitting on the ground or flying. They apparently fish at least partly during the day, as they were seen fishing on March 25, and in July one was observed to arrive and feed her young in the early evening before sundown.

On Bikar Atoll, March 24, 1952, a few were seen fishing with both other boobies, noddies, and Fairy Terns. In August (7-11) small numbers were resting on the ground, especially on the seaward sides of the islets, particularly Jaliklik. There were quite a few young in all stages of development. The old birds are very stubborn about leaving the young. They nest on the ground, using practically no nesting material at all.

Sula leucogaster — Brown Booby

This is the most common of the boobies, generally, and was seen on more atolls than the others, but was not seen nesting except on Wake Island, where it nested on the ground. It was most often seen flying, either going and coming from land, or fishing.

Near Pokak Atoll on March 25, 1952, large numbers of Brown Boobies followed the ship, diving at trailing fish lures. Several were caught. They were seen fishing with Masked Boobies. In July also many Brown Boobies were seen. It was hard to get an idea of their numbers and behavior as their habits seemed almost the opposite of those of the Red-footed Booby. During the day most of them were seen flying, especially over seaward beaches and reefs. They seemed to be the favorite victims of piracy by frigatebirds. When seen sitting, they were practically always on the ground or on rocks.

On Bikar Atoll, March 24, 1952, they were seen commonly, flying about, especially around seaward beaches, and fishing in company with both other boobies as well as noddies and Fairy Terns. Three of them made passes at the flag fluttering at the masthead. On August 7-11, many were seen flying and resting on trees on low branches and stubs, as well as on the ground. None were seen nesting, although several times birds behaved as though trying to draw attention of intruders away from nests. One bird was frightened off a nest about 4 meters up in a Pisonia tree, but identification was not certain, and it may well have been a dark phase of the Red-footed Booby. The color of the backs of these birds is a dark sooty-brown, rather than chocolate-brown as described by Mayr.

On Jemo Island, one Brown Booby was positively identified flying, December 20, 1951. On Kwajalein, also, one was seen flying with frigatebirds on January 23, 1952. Three were seen flying over the lagoon at Taka at 8:30 a.m., December 7, 1951. At Wotho Atoll, one was seen at Biken Islet, one at Ombelim Islet, and an immature one at sea in March, 1952. On Ujae, about 30 were seen on the evening of March 1, 1952, returning to Bokerok Islet after a day's fishing. One each was seen on Bikenkar and Ujae islets (by T. Arnow).

On Wake Island, October 22-25, 1953, a few were seen flying with frigatebirds on Peale Islet. On March 9, 1963, about 20 pairs of Brown Boobies were nesting along the lagoon side of Kuku Point, on the ground just back of the shore in the low vegetation. All had young, either in the downy condition or with wings somewhat feathered out. The adult plumage was dark reddish-sooty brown on the back.

Sula sula — Red-footed Booby

Red-footed Boobies were seen in numbers on the uninhabited northern atolls, but scarcely at all on the inhabited ones. This is to be expected, as their nests are commonly in low trees, readily accessible to the Marshallese, who eat sea birds of all sorts. The white plumage, bright-red feet, and blue beak readily identify these birds in the adult stage, but identification of immature ones is much less certain.

On our first visit to Pokak on November 25, 1951, many boobies were seen, but not distinguished as to species. On March 25, 1952, Red-footed Boobies were definitely seen, fishing offshore in company with Brown and Masked Boobies. In July (20-27), 1952, large numbers were seen on Pokak. The Red-footed seemed to be the most common boobies on the atoll, at least during the daytime. They were found scattered, roosting in the trees in all parts of the islets where Tournefortia or Pisonia trees occur, but were less common on Pokak Islet than elsewhere. During the day they were seen much more often sitting in the trees than flying, so it may be that they do most of their fishing at night. Judging from the guano accumulations, each bird must have a particular branch that is his favorite roosting place. They do not seem to be gregarious in the sense that they congregate in groups. They may be approached closely, only attempting to fly when actually molested or, sometimes, when a person is within a few feet. One, when disturbed, disgorged half a dozen fair-sized squid. A very few young birds were seen, and one bird was incubating an egg on a nest in a tree.

On our first visit to Bikar, on November 26, 1951, several Red-footed Boobies were seen flying. On March 24, 1952, considerable numbers were seen near the atoll, fishing with both other species of boobies, noddies, and Fairy Terns. Many were roosting in trees. During the period August 7-11, large numbers were to be seen at almost any time of day, roosting in Pisonia trees, or flying about when disturbed. A few nests were spotted, usually high in Pisonia trees, with old birds sitting on them, or with almost mature young.

On Jemo Island, Red-footed Boobies were nesting in numbers in the Pisonia trees, contributing greatly to the formation of phosphate rock beneath.

On Ujae Atoll, a single dead Red-footed Booby was seen on the outer beach of Rua Islet on February 25, 1952. On Wake Island a few were seen nesting on Peale Islet, April 21, and one flying on July 18.

Nests were seen in September 1951 (Sachet) with well-grown young in Tournefortia forest back of Kuku Point, Wilkes Islet, Wake Atoll, and at the same place in March 1963 about 10 or 12 nests were seen, mostly with full-grown young, wings fully feathered out. The nests were in the same trees as those of frigatebirds. Birds were sitting on several nests which may have contained eggs, but the eggs were not visible from below.

Fregata minor — Great Frigatebird or Man-o'-War Bird

This is one of the most magnificent of sea birds and a characteristic sight in the air over many atolls. They soar for hours, often in one place, apparently for the sheer joy of it. During storms their soaring ability is shown off to the best advantage, when they seem to be playing in the wind.

The amount and distribution of white on the females and young birds vary a great deal, and all attempts to perceive a regular pattern failed. The mature males are entirely black, except for their scarlet inflatable pouches.

The Marshallese name for the frigatebird is "aak" (Ujae, Ujelang).

On November 25, 1951, many frigatebirds were seen flying around Pokak Atoll, as many as 25 at a time. On March 25, 1952, 8 or 10 followed the ship and fished with the boobies. In July (20-27) an enormous population of frigatebirds were nesting here. The nests are in Tournefortia trees, and are small for the size of the birds, usually not more than 2 dm across. On a foundation of a few twigs, the nest is built entirely of the dried stems of Ipomoea tuba. It is soon cemented into a sturdy flattish structure by the accumulation of guano after the young bird hatches. At the time of our visit there were eggs and young in all stages of development. The partly grown young have blackish feathers on wings and back and white downy breast, neck, and head. The heads of immature birds vary from definitely rust colored to white. Both males and females sit on the eggs.

Nests are scattered over all except South Islet but are most numerous on Sibylla and Breje Islets, with many also on the wooded part of Kamome. They seem not to be especially concentrated in any one or few restricted spots, but to be fairly generally distributed where there are suitable trees. When approached the young rattle their bills furiously and scream at the intruder. Older birds usually fly away when an intruder gets to within a few feet, but occasionally they will disgorge fish first.

When a small boat crossed the lagoon and made a landing on Sibylla Islet hundreds of these birds were in the air at once circling over it. Normally at any time of the day there were a few in the air. Occasionally they would snatch fish from the surface of the water, and now and then, especially toward evening, it was possible to watch them pursuing boobies to pirate their day's catch of fish. It is a rare sight to watch these superb fliers in an aerial contest. Contrary to the general opinion, it was observed that the boobies often escaped without disgorging their fish.

On Ailuk, December 26-27, 1951, a single frigatebird was seen flying between Eneao and Mienwa Islets, two over Baojen Islet, and one over Enenkonge Islet.

On Jemo, December 15, 1951, at least 15 were seen flying at one time.

On November 26, while approaching Bikar Atoll, we were met by 6 frigatebirds. On March 24, 1952, many were roosting in the trees, scared up in great swarms by blasts of the ship's whistle. During the period August 7-11, they were seen in large numbers, roosting in trees and flying over the atoll. A few immature ones were seen in Pisonia trees.

On January 19, 1952, one frigatebird was seen soaring over Kwajalein Islet, Kwajalein Atoll; many dozens on January 23, 1952, and two on February 2, 1956.

On Ujelang, February 3-8, 1952, very few were seen during the day. A few were seen over the smaller islets occasionally, especially late in the afternoon. On Kalo Islet, one afternoon at about 5 p.m., during a storm, four were seen calmly riding out the storm high in the air. They were joined by two, then two others, then two more coming in from the south. They sailed in one position above the islet for some time, apparently enjoying the situation, then glided off to the east. Their places were taken a few minutes later by four more. One day just before dark, 40-50 were seen on Pyokin Islet where they apparently roost.

A colony of at least 75 frigatebirds lived on Bokerok, a tiny islet south of Bock Channel, Ujae Atoll, in February and March 1952, where some could be seen in the Pisonia trees at almost any time. At sunset they soar in great numbers over Bock Channel.

On Wotho, a colony of well over 100 roosted on Ombelim Islet in February 1952. During the hot part of the day they usually rested. Toward evening they soared in great numbers over this and other islets, especially Biken, and out over the sea.

On Wake Atoll, Wake Islet supports a colony of considerable size. In April (20-21), 1952, many were seen mostly roosting on the remains of an old pier on Peale Islet, and quite a number were seen flying on July 18. On October 22-23, hundreds were seen flying and roosting on a great steel framework of a bombed-out Japanese building on Peale Islet and also on power lines. They were seen in numbers in September 1961 in the trees at the base of Flipper Point, Peale Islet (Sachet). They were nesting in trees on Wilkes Islet, just back of Kuku Point, in March 1963. Perhaps 10 or 12 pairs were seen with eggs or soaring with red pouches inflated. Some were carrying twigs for nests.

Demigretta sacra — Reef Heron

The Reef Heron, though not abundant, is a common sight throughout the northern Marshall Islands; it was not seen on Wake Island. This is a medium-sized heron, and may be seen almost anywhere, in the woods or plantations, in openings, at the edge of the forest above the beach, around ponds and depressions, and out on the reef, standing very still or stalking its prey. It is called by the Marshallese "kaga" or "kage" (Ujelang) or "kawij" or "kavij" (Ujae), and, according to Enti, Chief of Ujae, is the only bird not eaten by them. When asked the reason for this he said, "It eats rats." It was not clear whether this habit made the bird unpalatable, or whether this was regarded as a beneficial service for which it was spared. Two color phases are almost equally common, a dark blue-gray one and a white one, with various intermediates, the most common being white variously mottled with gray. A single lighter gray (not bluish) one was seen on Lae, one of this color but with distal third of wings white, on Ujelang; and a white one with distal half of wings dark on Kwajalein. As this species seems to inhabit the islands the year around there seems to be no reason for detailing sightings by date. They are presented in Table II by atolls and islets and arranged by color phase and numbers seen.

Anas acuta — Pintail Duck

One Pintail Duck was swimming in the pond in the angle of the runways on Wake Islet, Wake Atoll, on March 8, 1963. A local informant says that as many as 9 ducks have been seen here at one time. The subspecies was not determined.

Cairina moschata — Muscovy Duck

A few domestic ducks, all of the muscovy type, were seen, either tethered or free in yards with the chickens. They were recorded from Ujelang, Utirik, and Wotho.

Gallus gallus — Chicken

Chickens are found on all or most inhabited islands in the Marshalls, and even on some at least temporarily uninhabited ones. During the present surveys they were definitely recorded from Ailuk, Jemo, Lae, Likiep, Rongelap, Ujelang, Utirik, and Wotho, and were doubtless present on at least two of the others. Most seen were of a rather nondescript or mongrel type, somewhat resembling wild jungle fowl, but some resembling Plymouth Rock and other domestic breeds were also seen. They are generally allowed to run free. It is of interest that chickens were in the Marshalls in pre-European times, but were prized by the Marshallese for their feathers and very rarely used as food (Chamisso, A. von, Remarks and Opinions, p. 157, 1821; Grundemann, D., Deutsche Kolon. Zeit. 4:444, 1887).

TABLE II: Color phases of the Reef Heron in the northern Marshall Islands.

Atoll Islet: Date	Blue	Gray	Gray with distal wing tips white	Mottled	White with wing tips dark	White
Ailuk						
Akulve (12/26/51)	1			1		
Jabbwi				X		X
Enenkong						X
Eneljar						X
Ulika				X		
I. north of Baojen	X					
Kwajalein						
Lojjairong (1/15/52) Lojjairek	1			2		2
Enebuoj (1/19/52)				1		1
Ebeye (1/26/52)					1	1
Kwajalein (1/27/52)	1					1
(3/15/52)	1					
Enelakken (8/3/52)	1			1		1
Lae (1/5-10/52)						
Lae	6	1		3		3
Loj	1					
Bikenaj						1
Bwi				1		
Lweljap	1					
Enejelto	1					
Rama	2					
Likiep						
Lado						1
Pokak (7/20-27/52)	3			3		4
Leeward reef (3/25/52)						2
Ujae (2/15-23/52 (3/2-15/52)						
Bock	1					1
Ujae	3					2
Ebeju	4					2
Wojia						1
Enelamoj	1					
Bik						1
Bikenkar						1
Ujelang (2/3-8/52)						
Kiloken				1		2
Ujelang	5		1	4		2
Morina						3
Kalo				1		
Wotho Atoll (2/15/52)	1					3

X - Present but numbers not recorded.

Pluvialis dominica — Golden Plover

The Golden Plover may undoubtedly be seen at times on any island in the central Pacific, especially in winter when it migrates south from its Arctic or Subarctic breeding grounds. It seems probable, however, that some individuals fail to go north, as at least a few birds may be seen in the Marshalls even in August. They are walking or standing on reefs, beaches, village streets, airport runways, in grassy openings, and even under coconut trees. They are often observed walking and feeding with domestic chickens, and are then more easily approached than usual. The Marshallese name is "kolej" (Ailuk, Lae, Ujelang, Wotho), apparently a cognate of the Hawaiian "koleo."

On Ailuk Atoll, December 24-31, 1951, plovers were seen on almost all islets visited, common in open coconut groves, in openings, and at low tide on reefs. They were relatively tame, easily approached to within 15 meters, even closer when they were walking with chickens. On Jemo Island, December 18-22, 1951, only 2 were seen, possibly 2 sightings of the same individual. One was seen on Gejen Islet, Rongelap Atoll, on February 15, 1956. On Likiep, December 15-16, 1951, they were occasionally seen; a flock of 4 was on the reef flat at low tide. On Utirik, December 4, 1951, they were seen generally on all islets. They were very tame here, running with chickens, only flying up on close approach of a person. A number were also seen on Utirik Islet on February 13, 1956.

Plovers were especially common on Kwajalein, on Kwajalein Islet, where they may practically always be seen resting on the asphalt of the airstrips in flocks of up to 20, or even more. They seem very accustomed to people. Twelve were seen on January 15, 1952, on a lagoon debris flat; on January 19, a number were on both outer reef flat and inner beach; and on January 23, February 12 and 29, and August 3, they were seen in some numbers on the airstrip. Even in August, 5 were seen together there. On October 10, 1950, they were common generally on Kwajalein Islet, and a number were resting on the airstrip.

On Ujae Atoll plovers were not as common as on some atolls. During visits on February 16-21 and March 2-11, 1952, 2 were seen on the reef flat at the north end of Bock Islet, one on Rua Islet, and on Ebeju Islet, one was seen in a flock of turnstones on the lagoon beach, 6 in a flock on the seaward beach; 4 in a flock with turnstones and curlews on Wojia Islet on the reef flat; 2 on the north end of Enelamoj Islet, 4 in a flock with curlews on Alle Islet, and one each was seen on south and east beaches of Ujae Islet.

On Lae, January 8-10, 1952, plovers were seen generally in small numbers, up to 4 at a time, on beaches and reefs at low tide, in openings in woods, and in open coconut groves. They were less common on Ujelang than on most other atolls. Four were seen on the seaward reef of Boken Islet and four on the lagoon side of Ujelang Islet, February 3-8, 1952.

On Wotho Atoll, February 19, 1952, several plovers were seen with turnstones on beaches, in small openings in coconut groves, and around the village. During two visits, February 12-16 and March 18-22, 1952, they were seen in small numbers on inner and outer beaches and in

the interior of most islets wherever conditions were at all open, often with turnstones, tattlers, and curlews.

On Bikar, August 6-11, 1952, single individuals, and rarely, small flocks of up to 7 birds, were commonly seen on all the islets, especially around the edges, on beaches and reef flats. On Pokak, July 20-27, plovers were seen now and then, one to three at a time, on any open space. They were mainly in winter plumage, mottled golden and dark above, white beneath. Five individuals were seen however, 5 at one time (by C. G. Johnson) in the handsome "spring plumage," dark brown beneath, with prominent white eyebrows and a white line running along the sides below the wings.

On Wake Atoll, October 25, 1951, and on October 22-23, 1953, several dozen were feeding around ponds and a few were scattered elsewhere. Two were seen on April 20, 1952, but Fred Schultz said that many were present only the day before. On March 8, 1963, 15 to 20 were seen on the shore of the pond in the angle formed by the runways on Wake Islet, and on March 7, 34 plovers were seen on the water catchment area.

Arenaria interpres — Ruddy Turnstone

The Ruddy Turnstone is, next to the Fairy Tern, the most universally present bird in the northern Marshalls. It was seen on all the islands visited except on Jemo and Rongerik, and on the latter there would have been little opportunity to see it even had it been there. It was found singly, or more often in small flocks of 2 to a dozen or more individuals, usually busily searching along the beaches or reef flats at low tide. As seen in the Marshalls, it does not merit the adjective ruddy at all, as it shows black gray and white, with a conspicuous white rump and wingbars when it flies. When approached it usually flies up and along the beach 100 meters or so and settles down. The Marshallese name is "kut kut" or "kutekut" (Ujae, Ujelang).

On Wake Atoll, one was seen on October 25, 1953, and on March 8, 1963, a flock of 15 to 20 was seen on the shores of the pond in the angle of the runways. On Pokak Atoll, July 20-27, 1952, a few were seen along seaward beaches, usually in twos or threes, sometimes in association with tattlers and plovers. Single individuals, pairs, and small flocks of up to half a dozen were occasionally seen on beaches, reef flats, and rock flats on Bikar Atoll, August 6-11. One was seen in a tiny opening, well within the Pisonia forest on Bikar Islet. One was seen flying about 40 miles southwest of Bikar at 11:15 a.m., August 13.

A small flock was seen on the west end of Watwerok Islet, Taka Atoll, on December 9, 1951. On Ailuk, December 24-31, 5 were seen on Akulwe Islet on the outer beach, a flock of 15 on the lagoon reef flat, Ailuk Islet, at low tide, and a few on each of Marib and Barjen Islets. On Likiep Islet, Likiep Atoll, several small flocks, one of them of 21 birds, were seen on December 16, 1951. On Kwajalein Islet, Kwajalein Atoll, October 19, 1960, a considerable flock of turnstones was seen on the air-strips. On Lae Atoll, January 7-10, 1952, 2 were seen on the outer beach

of Loj, and one on Bikelabet Islet. On Ujae, February 16-29 and March 2-15, 1952, 9 were seen in a flock on the outer reef of Bock Islet; a flock of 7 or 8 was seen by Ted Arnow, and one of 5 was seen by Fosberg on Ujae Islet, outer reef; 4 were seen on Rua Islet, one in a grassy opening in the interior; a flock of 10 was on the lagoon beach and one of 5 on the seaward reef flat, Ebeju Islet; a flock of 7, with plovers and curlews was on the outer reef flat on Wojie Islet.

On Ujelang Atoll, February 3-8, 1952, a flock of 11 was seen on the seaward reef of Enimoni Islet, 2 on the lagoon beach of Enellap Islet, 8-10 on the seaward reef and passage beach of Bokan Islet, 7 on a sand flat in the west passage on Kiloken Islet, and on Ujelang Islet, 9 on the lagoon beach and a large flock was on the seaward reef flat. On Wotho Atoll, small flocks of 2 to 5 were seen on most islets on beaches or reef flats, often with plovers and tattlers, February 12-16, 1952. On February 7, 1956, 3 were seen on the seaward beach of Rongelap Islet, Rongelap Atoll, and toward evening 2 were flying over the lagoon. A few were seen on Sifo Islet, Ailinginae, on February 10, 1956. Eight were seen on the south beach of Utirik Islet, Utirik Atoll, and another flock on the open part of the long west spit of this islet, back of the lagoon beach ridge, February 13, 1956.

Numenius phaeopus — Whimbrel

I found the Whimbrel to be very difficult to distinguish with confidence from the Bristle-thighed Curlew. What I took to be Whimbrels were brown birds with no rufous cast and with no chestnut on rump, that appeared, when flying, to be slightly shorter, stockier, with a somewhat more curved beak, rougher flight, and with a rather distinct note when flying: "dee-dee-dee-dee-dee."

Such were seen flying, one on Wotho, Enearik Islet, on March 20, 1952, one on Utirik Atoll in the interior of the long southwest spit on Utirik Islet, on February 13, 1956, and two on Lae Atoll, one by Arnow, one by me, January 6-10, 1952. Two were seen on Ujae Atoll, Ujae Islet, separately, possibly the same individual; one was seen on Rua Islet, and two were seen on the reef seaward on Ebeju Islet, March 2-15, 1952. Two curlews, Whimbrels judging from their notes, were seen on the Kwajalein airstrip in the sun at 3:15 p.m., October 19, 1960.

Numenius tahitiensis — Bristle-thighed Curlew

These large shore birds are fairly common in the northern Marshalls and were seen on most of the atolls visited. Their note when flying is "kivee, kivee." They are seen in the interior of brushy islets as well as on the shores and reefs, and they must eat Scaevola fruits, among other things, as their droppings are often seen to be packed with Scaevola stones. They are called by the Marshallese "Kowak" (Ujae) or "Kuwak" (Ujelang, two informants).

One was seen on Taka Islet, Taka Atoll, on December 7, 1951, and one (December 26) on Ailuk on the seaward denuded area of Enejela Islet at low tide where it would not flush but kept walking ahead of me, keeping a distance of about 15 meters. Two were seen on Sifo Islet, Ailinginae, February 10, 1956; one on Eniwetak Islet, Rongerik, February 11; and one on the east shore of Gegen Islet, Rongelap Atoll, February 15. The last bird was very tame. On February 13, 1956, three were seen in the interior of the spit on the west end of Utirik Islet, Utirik Atoll.

On Ujae Atoll they were common, February 16-21 and March 2-11, 1952. Two or three could be seen at almost any time on Bock Islet, probably the same ones. They were usually walking around the outside of the islet, but one was in a rocky opening in Scaevola scrub; 4 or 5 were seen several times on Rua Islet, 2 on the seaward reef of Ebeju Islet, 2 on Wojia, with plovers and turnstones, one on Enelamoj Islet, 5 on the south passage beach, Bikenka Islet, and several, one with plovers, on Alle Islet. On Ujelang Atoll, February 3-6, 1952, one was seen on Jerko Islet, 3 on the seaward reef of Enimoni Islet, 3 on Kirinjan Islet on seaward reef, one was on lagoon side, one was on Morina Islet, and 4 or 5 on Kiloken Islet, on the seaward reef, the passages, and in grassy openings in the scrub.

On Wotho, February 12-16 and March 18-22, 1952, they were commonly seen, singly, in pairs, or 3 or 4 together, on the beaches and reef flats of most of the islets. Here they were quite tame, allowing one to approach to within 3 to 5 meters before flying.

On Wake Island, one was seen in September 1951 near a little inlet on the lagoon side of the south arm of Wake Islet (Sachet). On March 7-8, 1953, several were seen near the pond in the angle of the runways on Wake Islet, and several were heard on Peale Islet. The cry was heard as "ti-tehi ti-rwhi" (Sachet). On Pokak Atoll, July 20-27, 1952, Bristle-thighed Curlews were seen more commonly than on any of the atolls visited. They were mostly on Sibylla, Breje, and Kamome Islets, 2 to 5 seen at a time. One morning at 7 o'clock a flock of 15 flew over our camp on Sibylla Islet at a rather low altitude. They were generally very tame. One pair, on Kamome, picked around on the beach to within 3 meters of where I was sitting. Another group of 5 spent a half hour aimlessly wandering around within 15 meters of where I was eating lunch, also on the lagoon shore of Kamome. They did not seem to be eating anything. One was panting, with its bill somewhat open and quivering; the day was very hot. Single individuals, two, or three at a time, were commonly seen on Bikar Atoll, August 6-11, 1952, on rock flats and around beaches. They were quite tame, allowing one to approach to within 10 meters before walking or flying away.

Heteroscelus incanum — Wandering Tattler

This is a trim, dark gray bird, white beneath, seen on many islands but seldom more than 4 at a time, almost always on the reef flats or beaches, mostly on the seaward sides of the islets. They are somewhat more wary than the other shore birds, flying up when approached, circling

out over the water or reef flat at low altitude and back, alighting 100 meters or more away along the shore. When they fly up, they sound a rather rapid high note "dee dee dee dee...." The Marshallese name is "kirij" (Ujae). Which subspecies was seen was never determined. All looked very uniform, except one smaller bird on Pokak Atoll.

On Kwajalein, January 15, 1952, several were seen on the outer reef flat; January 19, 8 were seen at once, and others before and after, at low tide on the outer beach, two were seen near the outer beach on February 2, 1956. On Lae, January 6-10, 1952, a few were seen, no more than 2 on an islet, usually on the outer beach or reef flat. They were seen on a number of islets on Ujae Atoll, February 10-23 and March 2-11, 1952, usually on exposed reef or rubble flats on the seaward side. On Bock Islet, 4 were seen in a flock on the outer reef flat, 2 together on a rubble flat on the lagoon side; and one to 3 were seen on each of Ujae, Rua, Ebeju, Alle, Bikenkar, and Enelamoj Islets. On Enelamoj, they were in a flock with turnstones. They usually flew low over the reef or the sea just outside it. On Wotho Atoll, February 12-16 and March 18-22, 1952, one or two were seen at a time, usually on outer beaches, reef flats, or passage beaches, on most islets, often in company with plovers or turnstones, or, more rarely, curlews. Seven were seen in a flock on February 5 on outer reef flats at Ujelang Atoll.

On Bikar Atoll 1 to 3 or rarely 4 Wandering Tattlers were occasionally seen on beaches and reef flats, especially on seaward sides of islets. They were commonly seen, as many as 4 at a time, July 20-27, 1952, in the passages and reef flats of Pokak Atoll. On Wake Island, one was on the lagoon beach April 20, 1952, one was seen October 22, 1953 and several on March 9, 1963, these around the pond in the intersection of the runways. They were very wary and hard to recognize with certainty, even with binoculars. Two were seen on Eniwetok Islet, Rongerik, on February 11, 1950. One was on a rubble tract along the spit extending from the west end of Utirik Islet, Utirik Atoll, February 13, 1950.

Limosa lapponica — Bar-tailed Godwit (?)

A large bird was seen on February 2, 1956 at the southwest end of Kwajalein Islet, Kwajalein Atoll, in weedy ground. It was brownish, with dark patches in wings. The neck was long and when on alert was held very erect...the head and throat with a large dark patch on each side. It flew off over the sea and circled around to land again on the other side of the airstrip. The rather reddish-brown color, the size, and posture suggest it may have been a Bar-tailed Godwit.

Sterna sumatrana — Black-naped Tern

This is a delicate little tern, found in small numbers on most of the northern Marshall Islands. They were mostly seen on gravel or sandbars and horns on the inner or, more rarely, outer, corners of islets. Their eggs are laid on gravel at the bases of these horns or spits, with no nest at all, the eggs blending in prefectly with the gravel on which they are placed.

They were first seen on Ailuk, where a flock of 10 was sitting on a sandbar with several noddies at the north end of Kappen Islet on December 26, 1951. They were pearl-gray on the back, and had a black band around the head, continuous with the black bill. The black band was more conspicuous than in Mayr's plate. They seemed reluctant to fly. When approached closer than 15 meters they would fly a short distance, then settle down again. Finally, after doing this 8-10 times, they flew away, flying low over the water.

On Ujae Atoll, on February 18, 1952, one was seen flying over the south end of Bock Islet. Seven were observed on Rua, on the inner south sand spit of the islet, on February 22. Two nests were here on bare gravel at the base of the spit, just above high-tide level. There were two eggs in one clutch, one in the other, very well concealed by their resemblance to their surroundings. They seemed identical in size, shape, color, and markings to the eggs of Gygis alba, 38 mm long, gray ground color with scattered brownish markings. Four birds were seen on the inner southwest sand spit of Alle Islet on March 10, 1952; one clutch of eggs was laid on a small collection of pebbles on otherwise bare sand, just above high-tide level. The eggs were very well concealed, only the frantic protests of the birds calling my attention to them, even though I had been walking around them for some minutes. Then I had to look carefully before locating them. These were exactly as described above. As long as I was in the vicinity, even during the time I ate my lunch sitting on a rock 15-20 meters away, the four birds protested noisily, "yak, yak, yak," "yip, yip, eep," "aa," "yak, yak, yip."

On Ujelang Atoll, February 16-23, 1952, three terns were seen on Kiloken Islet, and two on the east end of Ujelang Islet, flying and making a harsh low croaking note. On Wotho, February 12-16 and March 18-22, small flocks were seen on the inner corners of various islets, invariably on or over sand horns or beaches on inner corners of the islets. On Enearik Islet there were 8 on the east corner and 4 on the west corner. On Ombelim there were 10 on the inner beach--the islet is too short for corners to be distinguished. Six were seen fishing over the lagoon near Wotho Islet at 6:30 p.m., and one was with a flock of other terns near Majurwon at about 4 p.m. On February 5, 1950, two were seen flying over the lagoon side of Ebeye Islet, Kwajalein Atoll.

On Bikar Atoll, August 7-11, 1952, small groups of 3 to 10 of these birds were seen flying over or resting on open gravel bars and beach rock, especially between Almeni and Jaliklik Islets.

Sterna lunata — Bridled Tern or Gray-backed Tern

One bird seen flying over the north end of Bikar Islet, Bikar Atoll, August 7-11, 1952, was identified as this species. On Pokak, small numbers of Bridled Terns were seen, only on North Islet, where they were flushed with some reluctance from their resting places on the ground in the interior of this barren rocky islet. They circled around, protesting violently, with harsh noises, at the intrusion. They were medium sized, gray above, with a black crown, black feet, and a forked tail.

The species may have been present elsewhere, but we did not see it except on these two dry northern atolls. There is some discrepancy between the treatment of this species and S. anaetheta in Mayr's book and Baker's "The Avifauna of Micronesia," p. 160, 1952. As Mayr's was used for identifications, and as Baker does not describe these species, the bird observed is named in accord with Mayr, though the distribution given for S. anaetheta by Baker suggests that species rather than S. lunata.

Sterna fuscata — Sooty Tern

Sooty Terns are usually seen near their rookeries during the breeding season, and seldom at other seasons or places. They are extremely gregarious birds, laying their eggs on the bare ground, very close together, in the Marshalls in open or almost open areas, not necessarily so elsewhere. No nesting material is used, and when the eggs are on gravel or coarse sand they are very hard to see. They are variously colored, from grayish to brownish, variously mottled and speckled with brown or dark brown.

Our first Sooty Terns were seen on Taka Atoll. A few were flying around Taka Islet, on December 7, 1951, but it was on Natwerok Islet, where I spent the night of December 8-9, 1951, that I became really conscious of the enormous numbers of terns that inhabit a single rookery. On the seaward side of the islet the ground was literally black with Sooty Terns. Between the first sparse row of Tournefortia bushes the ground was scattered with their eggs, laid on the absolutely bare gravel and sand. Walking through this area it was hard to avoid stepping on the eggs, because they were so numerous and hard to see. When approached the birds rose in the air by the thousands with a deafening clamor. I camped on the lagoon side of the islet, and at about 6:30 p.m. a great horde of Sooty Terns came circling over my camp, screaming and squawking, and they kept this up continuously until after 7 a.m.

On Ailuk Atoll, on December 28, 1951, a stray Sooty Tern was seen over the lagoon near Bikon and another at the north end of Kapen Islet. There was no evidence of a colony of them on this atoll, however. On Ujelang a considerable number of Sooty Terns and eggs were seen on Jerko Islet, February 4, 1952, but only one or two birds at a time at rare intervals elsewhere in the atoll. The Marshallese gather and eat the eggs. Ted Arnow saw one Sooty Tern on Eniwetak Islet, Kwajalein Atoll on January 23, 1952.

Sooty Terns were seen commonly flying almost anywhere on Bikar Atoll, August 7-11, 1952. On Jaboero Islet, a small gravel bar only very slightly above high tide, vegetated only by Portulaca lutea, is a rookery of thousands of pairs. There were hundreds of eggs not yet hatched, and thousands of newly hatched chicks, which were small, gray-brown, not at all feathered out yet, and very active; quite a few were dead. On rock flats seaward of Almeni and Jaliklik Islets were scattered eggs and shells, and on the northeast extension of Jaliklik was a small rookery with many young birds with wings feathered out. Little or no guano was seen on any of these sites.

The great concentration of Sooty Terns, as of other birds, in the northern Marshalls is on Pokak Atoll. On November 2?, 1951, only one pair was seen definitely, flying around the ship near Pokak. On March 25, 1952, numbers of them were seen fishing together with other birds. Four were seen at sea, on July 19, between Wake and Pokak. On our visit from July 20-27, this was probably the most abundant bird on Pokak Atoll. They could be seen at any time flying over the lagoon and neighboring ocean, graceful and sure of themselves. At about sundown numbers of them could be seen in any part of the atoll, flying toward their homes on Kamome Islet. The rookeries were on Kamome, where large areas of ground were occupied by myriads of these birds. The actual parcels of land used as nesting sites and resting places by this gregarious species vary in size from an acre to several acres. They may lie in sparse Tournefortia scrub, but are more commonly in the open part of Kamome Islet, in places sharing ground with shearwaters. Usually in the center of such a rookery the Sida shrubs tended to be suppressed and the bunch-grass (Lepturus) favored. The ground was definitely not noticeably stained with guano, although both adults and young in all stages occupied it in such numbers as to blacken the air when they flew up. A few eggs were seen, lying on the bare ground with no nesting material whatever. The young birds swarmed over the ground in all stages of development from actively running chicks with only their wings feathered to full-grown birds perfectly able to fly, differing from their parents only in plumage. The young had feathers on back and wings tipped with white, and the under parts more or less dark, except for whitish anal region and undersides of wings. If the behavior of the Sooty Terns at Pokak is at all typical, it does not seem likely that Sooty Terns contribute materially to guano accumulations, though a gradual alteration of the lime sand over long periods of time is entirely possible.

On Wake Atoll, April 20-21, 1952, there was a considerable rookery of Sooty Terns on Peale Islet near the LORAN Station. The young were in various stages from pin-feathers to almost full grown. No eggs were seen. In the pin-feather stage the young were sooty brown on the back and sides, light gray downy beneath. Many were seen flying on July 18, 1952. C. G. Johnson reported that the colony at the LORAN Station on Peale Islet had eggs on that date. A small flock was seen near the west tip of Peale Islet on October 22-23, 1953. This was said by LORAN Station personnel to be the new nesting site, selected after they were driven off the old nesting place near the LORAN Station. Nesting was said to have been finished in July, but around this spot still lingered a number of almost fully grown but more or less crippled young ones, as well as some dead birds.

In September 1961 M.-H. Sachet found that the Wake Island colony had moved to Wilkes Islet, just back of Kuku Point. There had been considerable clearing of vegetation in this area, said by local people to have been done to provide nesting space for the birds. However, certain installations had been put in part of the cleared area. A few Sooty Terns were observed on the boulders on the reef at Kuku Point on September 9, but no great concentrations were seen. On September 15 the same place was visited after dark, and the colony had evidently returned, as cries from many birds were heard.

On March 8-9, 1956, this colony was again visited. Thousands of birds were present, with fully grown young, still in dark plumage, but able to fly up when approached. One was caught. It spit up a piece of fish (Sachet). A few adults were also seen on Peale Islet.

Thalasseus bergii — Crested Tern

This is the largest of the Marshall Island terns, and it is easily spotted by its heavy yellow beak. Its crest is not very obvious, but may at times be seen. It is not one of the more abundant sea birds in the Marshalls. There are usually a few pairs on an atoll, and they may be seen flying and hovering over lagoon reef flats, looking for small fish.

On February 29, 1952, 6 Crested Terns were fishing in the lagoon near the pier (and sewer mouth) on Kwajalein Islet, Kwajalein Atoll. Three or four could be seen almost any time during January 8, circling over the lagoon beach near Lae Islet, Lae Atoll, diving and fishing. At Ujae Atoll on March 8, 2 were seen over the lagoon, Ebeju Islet; on March 9, 3 were seen on Bikenbar Islet and one over the lagoon in the north part of the atoll; on March 10, 8 were seen over the seaward reef flat, Alle Islet; and on March 15, one was flying over the lagoon near the windward reef about 2 miles north of Ujae Islet. They are here called "he'er" (name tied to this species only by description by native, as no bird was seen at the time). On Wotho Atoll, February 16-23, 1952, the Crested Tern was rare, possibly only one or two pairs. One was seen at sea west of the atoll and 2 on Ombelin Islet. On Ujelang, February 3-8, one was seen over the middle of the lagoon, four commonly patrolled the lagoon beach near the east end of Ujelang Islet; and one was on the lagoon side of Kiloken Islet. On Utirik one was seen flying over the seaward side of Utirik Islet, February 13, 1956.

On Bikar, August 7-11, 1952, pairs or single birds were seen occasionally flying over reef flats, making harsh grating noises. They were commoner on Pokak than elsewhere, July 20-21. At any time of the day from one to 6 of these ungainly birds could be seen patrolling the shallow water, diving recklessly for small fish. Their disagreeable screaming or squawking was one of the most frequent sounds.

Procelsterna cerulea — Blue-gray Noddy

This is not a common bird in the northern Marshalls. We found it in small numbers only, just on Bikar and Pokak, of the 16 atolls visited.

A beautiful little bird, Procelsterna seems rather closely associated with open, unvegetated gravel ridges, against which its blue-gray color affords astonishingly good protection.

It is commonest on Pokak Atoll, where the following extract from my notebook was written, dated July 20-27, 1952:

"This delicate little bird, not seen elsewhere during this survey, is smaller than the fairy tern, and of exactly the blue-gray shade of the boulder and cobble ridges and flats so characteristic of Pokak landscapes. Small numbers of these birds are to be seen almost anywhere. Their curiosity is as well developed as is that of the fairy tern, and they seem even less afraid. On the more wooded islets, as Sibylla, Breje, Pokak, they seem to prefer the seaward side, though by no means staying there only. Possibly the greater prevalence of blue-gray stony ridges and flats on the outer sides is the reason for this. On North Islet, and Kamone, they are much more abundant and more persistently curious than elsewhere, and one can go nowhere on these islets without a constant accompaniment of their "Whirrrrr, Whirrrrr." When caught and held in the hand, one of these birds disgorged an astonishing quantity of partially digested dark blue fish.

"Although their behavior suggested that they might be nesting, no eggs or young were seen. One bird was flushed from a small empty nest, merely a slight accumulation of grass stems and feathers in a slight depression sheltered by 2 rocks on the boulder ridge on the seaward beach of Breje. This was probably one of their nests, and their color would suggest this as their normal habitat. It may be noted that, on Pokak, the web between their toes is a dull orange, rather than canary yellow."

On Bikar Atoll, in August 1952, 5 solitary individuals were seen, flitting over gravel bars and flats on Jaliklik Islet. A single bird was sitting on a nest with an egg, on the lagoonward end of a gravel bar between Almeni and Jaliklik Islets. It left the nest with no great reluctance when approached within 1 or 2 meters, but did not go far. The egg was whitish with a few dark speckles. The nest was only a few grass culms in a very slight depression in the gravel, very effectively camouflaged, especially when the bird was sitting on it.

Anous stolidus — Common Noddy

The Common Noddy is one of the common widespread sea birds in the northern Marshall Islands. Curiously, it was not seen on Utirik Atoll. The Marshallese call it "pijuak" (Ujae, Ujelang) or "bijuak" (Ujelang), and use it as food when they can catch it. It nests on the ground, in bushes, and in the crotches of trees. Its nest is an untidy collection of small twigs, often 30 cm across or more but never more than 5-10 cm high. Usually a number of nests are found in the same area, but it is not a conspicuously gregarious nester. Several birds may be seen flying together, but large flocks are seen only when fishing, possibly just accidental aggregations attracted by schools of fish, and when resting on sand spits or bars. They were frequently seen fishing during the day in the lagoon or in the ocean near an atoll.

Many were seen on Watwerok Islet, Taka Atoll, December 8-9, 1951, nesting on open pebble flats on the east end of the islet and in trees generally. On December 16, 1951 several were seen on the seaward side of Likiep Islet, Likiep Atoll. They were quite common on Jemo Island, December 18-22, but not seen nesting. On Ailuk a few were seen on Konwon, Tabu, Enenkonge, Eneljar, and Enijabrok Islets, December 26-27, 1951, and perhaps some of those seen fishing and sitting on sand spits and bars were this species.

On Kwajalein Atoll, January 15, 1952, Common Noddies were quite plentiful generally on Lojjaiong and Lojjairok Islets. One or two were obviously gathering nesting material. Many were seen at Enebuoj Islet, on January 19, especially on and over the outer reef flat. A few were seen on Eniwetak Islet on January 23. On August 5, 1952, one Common Noddy was the only sea bird seen near Enelapkan Islet.

Common Noddies were plentiful on Lae Atoll, January 5-10, 1952, and were seen over practically all islets and all parts of the lagoon visited, in numbers up to a dozen at a time. On Enejelto Islet, quite a few were nesting high in Ochrosia trees, and on Bikalabet Islet a flock of 20-30 were sitting on a sandbar. This bird was seen at least occasionally on all islets visited on Ujae Atoll, February 16-23 and March 2-11, 1952. Some were seen gathering nesting material in the forest on Bock Islet. Hundreds were seen on Bokerok Islet, and quite a few on Rua Islet, February 22, where three nests were found in a Terminalia samoensis tree on the seaward side. On Wojia Islet 6 were seen pursuing a Fairy Tern with a fish in its beak. The tern escaped. On March 9, 1952, at low tide an enormous flock of hundreds or even thousands of noddies blackened a long sand spit uncovered at low tide. They seemed to be holding the usual "conference" so characteristic of Common Noddies. In the afternoon at high tide many were flying over the islet. One nest with an egg in it was found in a bush about 2 meters above the ground. The egg was white with brown markings. The old bird protested and flew around close by, trying to drive me off. Many were seen flying about Enelamoj Islet, and they were abundant on Alle Islet. Here one was nesting in a big crotch of a Pisonia tree about 5 meters above the ground. The nest in this broad depressed crotch consisted of very little material, a few twigs and leaves, not at all typical for this species. On Ujae Islet where the people live, only 6 noddies were seen, March 13, 1952.

On Ujelang Atoll, February 3-8, Common Noddies were also abundant. The Marshallese gather and eat the eggs in large numbers, and also eat the fully feathered young birds. The birds' habit of sitting in large numbers on beaches and reef flats was very noticeable on all islets where they were common. Hundreds were seen on Bikom Islet, the last islet on the windward reef to the west, where they were nesting in Pemphis acidula trees. Fewer were seen on Ujelang Islet, where the village is located, than on the others. On Nelle Islet hundreds were seen sitting in crowds on the beaches and flying overhead. Large numbers of wings were lying on the ground around a temporary native camp. There were quite a few nests here on the ground, with young of various ages. Hundreds were also seen on Bieto Islet, some nesting, mainly in trees. These were white when very young, soon turning dark gray. When pin-

feathers have appeared on the wings and tail the white forehead has developed. On Bokan Islet they were nesting on the ground. They were very abundant on Jarko Islet, nesting on the ground in the same area as the Sooty Terns. Most of the nests there have eggs. On Ujelang they used rather little nesting material.

On Wotho Atoll, there were usually some to be seen flying overhead, February 12-16, 1952. There were a considerable number along the seaward beaches, small or moderate numbers over the lagoon and sea, and a few on the larger islets. Many were on Enejelto Islet, and many birds and several nests on Enearik Islet, the nests with downy young. One bird scared up there flew with difficulty, as it had Pisonia grandis fruits stuck over its feathers. There were several nests on Biken Islet, and many birds were seen on Bokanaetok Islet. Some birds and a nest were on Eneobnak Islet, the nest in a Guettards speciosa tree. Noddies were commonly seen in the middle of the day in groups on the beaches. On February 15, 1952, F. Stearns MacNeil saw one pick up a neritid snail from the reef, fly high in the air with it, drop it, and follow it down and eat it after the hard shell was broken. Fragments of these shells are common on the reef rocks.

Three Common Noddies were seen, February 7, 1956, on Rongelap Islet, Rongelap Atoll, flying out to sea; toward evening 2 were seen over the lagoon. A few were also seen on Kabelle Islet and here 5 nests were seen. These were empty, but eggs were found by other members of the party. These nests were loosely constructed of dried fruiting inflorescences of Tournefortia argentea. Two Common Noddies were seen on Enivetak Islet, Rongerik Atoll, February 11, 1956. On February 10, a few were seen on Sifo Islet, Ailinginae Atoll.

On Bikar Atoll, March 24, 1952, some noddies were seen flying, probably this species. On August 7-11, four birds were seen on Jaliklik Islet, as well as 2 nests in crotches of Pisonia trees.

Common Noddies were common but by no means abundant generally on all the islets of Pokak Atoll, July 20-27, 1952. Their nests were observed most commonly on Kamome Islet, where they were scattered in shrubs, on grass tufts, on rocks, and on the ground, with eggs at this season. The adult birds here were of a lighter brown color than those seen elsewhere in the Marshalls. When sitting on their nests they would permit a person to approach to within 15 meters before flying up. Then they circled about screaming at anyone examining their nests. These were, as usual, untidy accumulations of twigs. The birds, here as elsewhere, tend to sit in groups on sandbars and rubble flats exposed in the lagoon, apparently doing nothing but enjoying the sun and each other's company.

On Wake Atoll, April 20-21, 1952, a few Common Noddies were seen flying and one nest was found. Birds were not seen in it so it may have been unoccupied. One bird was seen on July 16, 1952, flying. On Peale Islet, October 22-23, 1953, many were seen roosting or flying with frigatebirds around the old frame of a bombed-out building. There was one nest with a half-grown young bird. On Wilkes Islet,

September 9-12, 1961, Common Noddies were seen in small numbers sitting on boulders just off Kuku Point (Sachet). In 1963, March 7-9, they were seen in exactly the same place; a few were also on the old Pan American pier on Peale Islet.

Anous tenuirostris — White-capped Noddy

The White-capped Noddy is almost as common in the northern Marshall Islands as the Common Noddy, in places more so. It is a slightly smaller bird with a more irregular, uncertain flight, darker in color, with a more pronounced white forehead. It is much more gregarious, especially when nesting and fishing. Its nests, made of Tournefortia argentea leaves, compact and plastered together with excrement, much smaller than those of the Common Noddy, are found in groups of dozens, or even hundreds, crowded together in very small areas. Sometimes dozens of these nests will be in a single Pisonia tree. The guano under these rookeries contributes perhaps more than that of any other bird to the formation of atoll phosphate rock (Fosberg, Soil Science 78: 99-107, 1954, and American Journal Science 255: 584-592, 1957).

On Watwerok Islet, Taka Atoll, December 7-8, 1951, White-capped Noddies were common, nesting in trees. Their eggs were light colored, only lightly speckled. Several were seen on Jemo Island, December 18-22. On Ailuk Atoll, December 24-31, they were more common than the Common Noddy. Large flocks, of as many as a hundred, were seen fishing in the lagoon, and occasional individuals were seen on most islets visited. On Kwajalein Atoll 4 were seen flying over the lagoon just off Loggaiong Islet, on January 15, 1952. On January 23, hundreds were seen nesting high in the Pisonia grandis trees on Eniwetak Islet. From January 27 to February 1, 1952, a flock of 2-3 dozen were watched fishing in the lagoon off Kwajalein Islet. They were frequently seen around the anchored ship, where schools of tiny fish were to be seen almost any time. The birds would rest on the water, then fly around. When bonito would chase the small fish to the surface the noddies would fish frantically. When full they would rest again on the surface.

On Lae Atoll, January 6-10, 1952, this species was very scarce. Only one was seen, on the north side of the lagoon, January 6. On Ujae Atoll, February 16-21, 1952, White-capped Noddies were nesting abundantly and gregariously in Pisonia trees on Bock and Bokerok Islets and were to be seen in hundreds flying around these islets. The young were fully feathered out but not yet flying. The Marshallese collect these young in some numbers for food. They built a fire at the base of a huge Pisonia tree on Bock Islet, loaded with nests. It burned all day, and finally one half of the tree fell, at least 5 or 6 dozen young birds were collected. Here the birds are called "jagarik" but the young at this stage are called "nemajelij kon." They were also common on Alle Islet, a dozen nests in a close group in Pisonia and Terminalia trees.

On Ujelang Atoll, February 3-8, 1952, the White-capped Noddies were seen more locally than Common Noddies, but in considerable numbers. Many were seen on Bieto Islet, some nesting. Hundreds were nesting on Kirinyan Islet, concentrated in certain patches where there were many nests to a tree; the largest such patch noticed, about 20 by 40 meters, had several hundred nests. These nests contained more material than those of Common Noddies, chiefly Tournefortia leaves, were much more compactly constructed, but of smaller dimensions. Eggs and young birds, up to completely feathered-out ones, were in the same colonies. They were also seen nesting on Bikom Islet, and on Bokan, where their numbers were smaller than on Kirinyan. Here they also nested gregariously, in trees. The fledgling White-capped Noddy seems to develop its white forehead sooner and more conspicuously than the Common Noddy; it shows even before pin-feathers appear. The natives of Ujelang collect both eggs and young birds for food.

Noddies were commonly seen fishing in the lagoon and the open sea around Wotho Atoll at any time of the day February 12-16, and March 12-22, 1952. Many nests were seen in trees on Wotho Islet, on March 20. In February some nests were seen in Ochrosia oppositifolia trees on Enegelto Islet, and about 20 nests on Enearik. Many nests were seen on Biken Islet, in Pisonia and Tournefortia trees, and a small group of nests were in Pisonia on the seaward side of Kabben Islet. Hundreds of nests and a multitude of birds were seen in Pisonia and Tournefortia trees on the seaward side of Ombelim Islet.

This species was not plentiful on Bikar Atoll, August 7-11, 1952. A single bird and three nests were seen on Almeni Islet in the Pisonia forest, and a small colony of a couple of dozen nests and a few birds in Pisonia trees on Juliklik Islet. Very few birds were seen outside the forest, and none at all were seen on Bikar Islet. On February 9, 1956, a few birds and several nests were seen on Kabelle Islet, Rongelap Atoll. On February 10, 1956, several were seen on Sifo Islet, Ailinginae Atoll. This species was less plentiful than the Common Noddy on Pokak Atoll, July 20-21, 1952. It was seen occasionally fishing in the lagoon or just outside. Small groups of nests were placed in the Pisonia trees in the groves on Kamome Islet, but it was not noted whether there were eggs.

Gygis alba — Fairy Tern, White Tern, or Lovebird

This most charming and beautiful of sea birds was the only species seen on all of the atolls visited. It is also the least afraid of man of any observed, even on inhabited atolls. On the less frequented islets its curiosity is amusing to watch, as the birds, several to swarms, will hover over the heads of visitors and follow them a few feet overhead. If one is quiet he can at times induce one to settle on his head or outstretched hand. The Fairy Tern is definitely a tree-frequenting bird. It lays its eggs in trees if any are available, roosts in trees ordinarily, and when not out fishing is usually seen not far from patches of forest or scrub. Pisonia grandis seems to be the preferred tree, but it is also very frequently associated with Tournefortia

argentea. Its normal food seems to be small fish. During the Arno Atoll Survey, in 1950, Joe Marshall found in the crop of a specimen that he shot a seed later identified by me as the beach morning-glory, Ipomoea pes-caprae, a plant not known from Arno Atoll, though common on Majuro, a few miles away. It may have been a drift seed, picked up on the beach, and was probably picked up for a gizzard stone, rather than for food.

My first sight of Fairy Terns in numbers on the 1951-52 trip was on Eeluk Islet, Utirik Atoll, where a great cloud of them were in the air when I was in the brushy part of the islet. The egg of one of them lay on a dead stub of a branch of a Tournefortia tree, balanced in a slight depression. Its ground color was a pale brownish gray, irregularly mottled with brown-gray, brown, and very dark brown. On Taka Atoll, December 7-8, 1951, on Lojiron and Watwerok Islets, they were very abundant, nesting in bushes and trees. The eggs were laid on bare branches wherever there was a knothole or any slight irregularity. The eggs and young in various stages were scattered generally over the wooded parts of the islets. They were occasional on Jemo Island, December 18-19, 1951, but not seen nesting. On December 24-31, 1951, on Ailuk Atoll, a few were seen flying over the southern part of the lagoon, and small numbers were on or near almost all islets visited, more over the tiny uninhabited northern islets. On the islet just north of Baojen Islet, one was seen with an egg, and a flock of 15 were seen fishing. An occasional one was seen on Likiep Islet, Likiep Atoll, on December 16, 1951.

Fairy Terns were seen, but not more than half dozen at a time, on or over practically all islets visited on Lae Atoll, January 6-10, 1952. On Kwajalein Atoll on January 15, a number were seen flying over Lojjaiong Islet, several over Enebuoj Islet on January 19, and large numbers, including several young ones, on the still densely wooded Eniwetak Islet.

On Ujae, in February 1952, large numbers of Fairy Terns were seen. The Marshallese name here is "mojau." There were many in the trees and flying overhead on Bock Islet. One was seen in the pinfeather stage on February 18. Here, along passages and beaches, they could be seen occasionally at any hour of the day carrying small fish in their beaks. Hundreds were seen flying overhead on nearby Bokerok Islet, hundreds also on Rua Islet. They were only occasionally seen on Ebeju Islet, but here on February 25, 1952, 3 eggs were spotted on Tournefortia branches, 3 on Pisonia, one broken, one on the ground under a Pisonia tree, and 2 young birds almost feathered out. The eggs measured were 38 mm long. They were rare on the inhabited Ujae Islet. Hundreds were seen over Bik Islet, and many on Enylamij Islet. They were abundant on Alle Islet, where one with an egg on a Pisonia branch about 6 m above the ground drove off a noddy much larger than itself, when it approached. One over the lagoon with a fish in its mouth outflew and eluded 6 noddies that were pursuing it. Notes taken on the spot read "On Wojia Islet over the lagoon beach, six noddies were vigorously pursuing a fairy tern that had a small fish in its beak. The chase lasted several minutes, but in spite of the wavering, fluttering type of flight of the tern, it got away from its apparently surer-flying assailant."

On Ujelang Atoll, February 5-8, 1952, a few Fairy Terns, here called "juuvi" or "chew'wi," were seen on all islets. Many were seen on Nelle Islet, also on Jerko. No eggs were seen, though the birds behaved as though they might be nesting.

On February 19, 1952, Fairy Terns were seen frequently over the thin scrubby forest on Wotho Islet, Wotho Atoll, but not more than a few at a time. On this atoll, in February, they could be seen generally almost anywhere, flying over the lagoon or open sea in pairs or small groups, or fishing in flocks with other terns, or flying overhead on islets, protesting intrusion into their privacy. Probably in most such cases there are eggs on the bare branches of the trees, but they are seen only with difficulty. Many birds were seen on Ombelin Islet, where one egg was seen on a Tournefortia branch, also one half-feathered young and one fully feathered young. On Enejelto Islet many were flying overhead, protesting as though they had eggs in the trees. Many were flying over the long sand spit called Bokenaetok, also on Eneobnak Islet.

On Ailinginae Atoll, February 10, 1956, hundreds were seen on Sifo Islet. On February 11, 1956, quite a few were observed on Enivetak Islet, Rongerik Atoll. Many were seen on Rongelap Atoll, on Kabelle Islet, February 9, and on Gegen Islet, February 15, 1956. From the ship, on November 26, 1951, Fairy Terns were seen very commonly flying over all three islets of Bikar Atoll. On March 24, 1952, also from the ship, they were seen flying over the north, east, and south sides of the atoll. August 7-11, 1952, were spent on land on Bikar Atoll. Fairy Terns were common generally, hundreds of them on Almeni Islet, flying everywhere, especially over Pisonia trees. A few downy young were in the trees.

Pokak Atoll is the home of great numbers of Fairy Terns, just as of other species of sea birds. They flew around our ship during our abortive visitson November 25, 1951, and March 25, 1952. During July 20-27, 1952, they were to be seen at any time on any of the islets, over the lagoon, and over the nearby ocean. During the hottest part of the day they tended to rest on the branches of trees, or, less often, on the ground or on rocks. They hovered in swarms over anyone walking through the woods or bush, venturing almost within arm's reach. Their eggs were found, occasionally, almost anywhere in Tournefortia trees, and very abundantly in Pisonia in the groves on Kamome Islet, balanced, in the usual fantastic manner on any horizontal limb, on a fork of a tiny branch, or in a slight depression anywhere. One was seen on a large boulder on South Islet, where there were no trees. The eggs on Pokak Atoll have about the same range of color variation as seen elsewhere in the Marshalls, but here the small end is much less pointed than seen elsewhere. In fact, it is almost the same shape as the larger end. The birds are induced to leave their eggs only with some hesitation. The way they daintily back away from the eggs when leaving is pleasant to watch, also their careful way of approaching and settling down on the egg when they return. The Fairy Terns here seem to have a more pronounced blue basal half of the beak than those seen elsewhere.

Several were seen flying on Wake Atoll, Wake Islet, April 20-21, 1952, and others around Pisonia trees on Peale Islet, October 22-25, 1953. A few were seen in and over the Tournefortia forest both on Peale and Wilkes Islets, on September 5, 1961 (Sachet) and March 7-9, 1965.

Eudynamis taitensis — New Zealand Cuckoo

The only indigenous passerine species in the Marshalls was only seen once, flying over the seaward beach and into the trees on Likiep Islet, Likiep Atoll, on December 14, 1951. This may be the second most northerly record for this bird. It was collected on Bikini by J. L. Morrison in 1946 and 1947. It seems commoner farther south, as two were seen on Jaluit Atoll in 1958.

Acridotheres tristis — Indian Mynah

Several pairs were established and very much at home on Kwajalein Islet, Kwajalein Atoll, in 1952, but none were seen on February 2, 1956, or in 1958 or 1960.

Padda oryzivora — Java Sparrow or Java Finch

A cage of the attractive small finches with large conical red bills, commonly called Java Sparrows, was seen on Wake Island in a house on April 13, 1952.

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